May 2020

Reference of the PR19 final determinations: Response to Yorkshire Water's statement of case

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Contents

1. Executive summary

Our response to Yorkshire Water's statement of case

1.1 In reaching our final determination for Yorkshire Water, we considered the company's business plan in line with our statutory duties. We are satisfied that our final determination ensures that the company has adequate funding to carry out its regulated business, including meeting its statutory and regulatory obligations, to deliver the outcomes within its final determination and thereby provide for the long-term resilience of its systems in the interests of current and future customers.

1.2 Overall, our final determination for Yorkshire Water set the company a challenge to step up to meet the performance of its peers, while remaining cost efficient. Yorkshire Water has not risen to that challenge. Although the company states that it agrees with the aims of the PR19 price review,[1] it has not accepted the outcome of the price review which delivered on those aims. We set out a balance of risk and return that was appropriate and based on market evidence.

1.3 On 2 April 2020, Yorkshire Water provided us with a copy of its statement of case to the Competition and Markets Authority (CMA) in respect of its reference of the 2020-25 price controls for redetermination.

1.4 In its statement of case, Yorkshire Water raises concerns over the combined stretch across the performance levels we set and the costs we allowed in our final determination, in the context of its historical performance and cost efficiency. It suggests that we made material interventions which have the effect of overriding the preferences its customers expressed. Yorkshire Water also raises issues of detail about our calculation of allowed return and criticises our use of mechanisms to share benefits from highly geared financial structures. It asks the CMA to reverse our implementation of the PR14 wholesale revenue forecasting incentive mechanism. It claims a revenue forecasting error in its PR14 business plan can be fully addressed through removing its reported connection charges from the incentive's calculation.

[1] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 92, paragraph 320

1.5 We summarise below what was included in our final determination for Yorkshire Water, and outline the key issues that the company raises in its statement of case.

Our determination for Yorkshire Water

1.6 Our final determination allowed **efficient wholesale and retail costs** of £4,442 million. This total is £304 million lower than requested by the company in its August 2019 representation on our draft determination.

1.7 Our determination set a range of **performance commitment levels,** the details of which we set out in the final determination.[2] They included 15 common performance commitments, 12 of which had financial incentives, and 28 company specific, or bespoke, performance commitments, 16 of which had financial incentives.

1.8 These performance commitments meant Yorkshire Water's customers would see a 15% leakage reduction, 41% reduction in pollution incidents and 47% reduction in internal sewer flooding incidents by 2024-25. We also set levels of a 34% reduction in customer contacts about drinking water quality and 742 kilometres of rivers improved in Yorkshire Water's region.

1.9 We intervened in some of Yorkshire Water's proposed performance commitments or outcome delivery incentives (ODIs) to seek improved performance for customers and the environment in 2020-25 and the long term. Our interventions were targeted and proportionate based on the information available to us, and largely preserved the pattern of customer preferences implied by the ODI rates in Yorkshire Water's September 2018 business plan.

1.10 The final determination set an **allowed return** of 2.96% (CPIH) which we consider provided a reasonable return for an efficient company based on the market evidence. We are satisfied that our final determination for Yorkshire Water provided an appropriate balance of risk and return.

1.11 We consider that Yorkshire Water's determination was **financeable.** We advanced revenue of £85 million from future periods through pay as you go (PAYG) adjustments. Following the revenue advancement, we assessed the financial ratios in Yorkshire Water's final determination to be consistent with a credit rating two notches above the investment grade. Consistent with the PR19

[2] Ofwat, 'PR19 final determinations: Yorkshire Water – Outcomes performance commitment appendix', December 2019

methodology and our approach at previous price reviews, our financeability assessment was made on the basis of the notional capital structure and before taking account of reconciliation adjustments for past performance.

1.12 As a result of our determination, Yorkshire Water's average residential bill was set to decrease from £383 in 2019-20 to £349 in 2024-25. Taking into account inflation we would have expected to see average bills remain stable across the five years and remain broadly consistent with those in 2019-20.

Our determination in context

1.13 Yorkshire Water is a highly geared company having carried out a whole business securitisation and increasing gearing to well above the notional level. Yorkshire Water's current financial structure is the result of restructuring carried out more than a decade ago where the company took out loans at the level of the regulated business and issued loans to its holding companies which total £967 million as at 31 March 2019. Yorkshire Water reported gearing of 75.8% as at 31 March 2019. Yorkshire Water's credit ratings and levels of financial resilience under its actual structure are a consequence of its past financing and capital structure choices, which also include long-term inflation swaps entered into as part of its financial restructuring which carry a mark to market loss.

1.14 As we noted in our introduction to the CMA,[3] the company's September 2018 business plan aimed to reduce its gearing to 70% by 2021. However in its representation on the draft determination, Yorkshire Water delayed its commitment to reducing gearing to 70% to 2025. Yorkshire Water aimed to reduce gearing by retaining dividends, and injecting £625 million of capital, in three tranches starting in 2020-21, through the repayment of loans that it has previously made to another group company. It proposed to fund the cash injections through a parent company to the regulated business.

1.15 We provide further detail on the company's actual financial structure and present information on the company's historical dividend payments and credit ratings in chapter 2 of 'Risk and return common issues'.

1.16 Yorkshire Water has been **cost efficient in previous price reviews**. As we explain below we can confirm that if it continued with similar levels of base costs in 2020-25 as in earlier price review periods, it would still be efficient according to our PR19 models. However, its forecast higher wastewater base

[3] Ofwat, 'Reference of the PR19 final determinations: Explanation of our final determination for Yorkshire Water', March 2020, p. 11, paragraphs 134-135

costs, as well as poorly evidenced enhancement proposals that we were unable to fully accept, caused Yorkshire Water to **fall in efficiency ranking at PR19.**

1.17 Although it has met most of its PR14 performance commitments, Yorkshire Water is also a relatively poor performer on some of the measures of critical importance to customers, such as internal sewer flooding and leakage.

Meeting our duties in the round

1.18 In reaching our final determination, we are satisfied that we acted in accordance with our statutory duties in the round. We ensured that the company had adequate funding properly to carry out its regulated business, including meeting its statutory and regulatory obligations, and to deliver the outcomes within its final determination.

1.19 We set out the duties, and provide more detail on how we complied with them, in chapter 2 below and in chapter 3 of our 'Introduction and overall stretch' document. In particular, we explain why the points made by Yorkshire Water are not hard-edged questions of law, but rather disagreements as to the merits of decisions that Ofwat made in its final determinations. We address the ways in which Yorkshire Water wrongly tries to present some of its arguments as breaches of duty in summary form in chapter 2 below, and further develop those points in the following chapters of this document.

Key issues for Yorkshire Water

1.20 We set out below the key issues raised by Yorkshire Water in its statement of case and in its presentation to the CMA on 15 April 2020, and summarise our response to each. We cover these issues in further detail later in this document and/or in our accompanying documentation, and indicate this below where appropriate.

Yorkshire Water's historical efficiency and performance record

1.21 Yorkshire Water implies that **since it was assessed as efficient in previous price reviews it should also be assessed as efficient in PR19**. We disagree. In our analysis Yorkshire Water's historical cost data demonstrates it has been efficient as shown by our PR19 cost models. We set an efficient level of base

costs using a benchmark derived from historical outturn performance, adjusted for frontier shift and real price effects. It is when we compare that efficient level of costs with the proposed increase in base costs in Yorkshire Water's PR19 business plan that the company's efficiency falls. High future costs for the same activities when compared with historical costs inevitably mean it is less efficient.

1.22 We also note that **Yorkshire Water has typically not spent its cost allowance in previous price reviews.** Although this could be due to efficiency it may also indicate a failure to fully invest in providing long term and resilient services. We consider this to be a likely explanation. Table 1.1 below shows Yorkshire Water's consistent underspend of its cost allowances by a considerable margin even in its most recent expenditure, when, as the company says itself,[4] it was investing additional total expenditure (totex) and substantial outcome rewards to prepare for the performance challenge of 2020-25. We discuss this outperformance of cost allowances further in 'Introduction and overall stretch' chapter 6.

Table 1.1: Yorkshire Water's cost underspend over the last four five year regulatory periods

Company	2000-05	2005-10	2010-15	2015-19
Yorkshire Water	11.9%	0.8%	6.4%	1.9%

1.23 When compared with its peers, **Yorkshire Water's performance in key measures of importance to customers, including sewer flooding, is poor.** We discuss performance issues further in chapter 4 below. Despite this poor performance Yorkshire Water met many of its PR14 performance commitments. We consider the levels set at PR14 for some performance commitments were not sufficiently stretching and discuss this more in 'Outcomes – common issues'. At the 2014 price review, all companies benefitted from a cost allowance set using benchmark cost models. However, companies were not held to account for the same levels of service from that cost allowance and set their performance levels themselves. In PR19 we aligned service expectations and cost efficiency on a consistent basis for all companies.

[4] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 29, paragraph 90

Relationship between costs and outcomes

1.24 Yorkshire Water suggests that the final determination stretch on its performance meant it would have to divert funding from maintaining its long-term resilience to short-term measures in order to minimise performance penalties. It deems the funding allowance was insufficient to meet both its long-term commitments and AMP7 performance commitment levels. It considers the efficiency challenges on costs and the stretch on performance larger than ever before and considers they were derived in isolation from each other, and ignoring regional specific factors.

1.25 We disagree. Our final determination set performance targets at stretching levels but ones we considered achievable based on our analysis of historical improvements in the sector. We recognise that the stretch is large when viewed against Yorkshire Water's current performance but we consider **its current performance reflects low levels of performance ambition and delivery in the previous five year period.** Improving asset health and service performance are important both now and to ensure performance in the long term.

1.26 Our final determination made considerable cost allowances for statutory enhancement proposals as well as an efficient base cost allowance, a total of £4,442 million. Our cost assessment approach used robust benchmark models where possible and we consider the gap between our view and Yorkshire Water's view of costs is due to the company's inefficiency.

1.27 We considered company representations to the draft determination and explored possible differences through new cost drivers in enhancement models where appropriate. We did not make additional allowances for Yorkshire Water to fund performance improvements that could have been achieved through previous price control allowances. Nevertheless, we set performance levels in some areas, such as leakage, lower than the company's business plan. This means that if the company were to perform in line with the levels it proposed in its business plan, it would earn outperformance payments.

1.28 Yorkshire Water claims that we 'forced customers to accept a lower leakage target than companies had been prepared to commit to'. However, there was nothing in our final determination to stop Yorkshire Water from reducing leakage by 25%, in line with what it claims are its customer preferences. If it were to do so, it would earn outperformance payments for the reduction it made above the 15% which we set as the efficient reduction to be made within our base cost allowance.

1.29 Yorkshire Water also claims that in the final determination we ignored regional factors, such as the high number of cellared properties it serves impacting its sewer flooding costs or performance. However, the company fails to demonstrate that cellared properties was the material factor affecting its poor performance, even in the evidence it provides with its statement of case. Nor is it clear why setting lower performance levels in the 2020-25 period will benefit customers in the longer term.

1.30 Overall, the methodology we have used in PR19 means that Yorkshire Water's past performance is now demonstrating just how much it has to deliver to align with its peers. As explained above, despite meeting its PR14 performance commitment levels, it is providing a relatively poor service compared with its peers in measures important to customers who cannot choose their supplier, such as internal sewer flooding. Our move to benchmark comparisons in both costs and a wider set of outcomes demonstrated the gap between Yorkshire Water and the rest of the sector. There is evidence that Yorkshire Water has a taken a short-term approach in previous review periods, underspending allowances and under maintaining assets. Yorkshire Water considers customers should pay for it to catch up with its peers. It has not fully spent its benchmark PR14 allowance and has earned outperformance payments, paid for by its customers, in areas such as internal sewer flooding performance due to the low bar it set itself at PR14. **We needed to step in at PR19 to protect customers' interests.**

1.31 We note that Yorkshire Water – a relatively poor performer – says it needs more money than other companies to make the improvements needed to meet its PR19 performance commitment levels whilst another of the disputing companies, Anglian Water, says it needs more money than other companies because it is a high performer. Both companies state that they require higher costs because their performance varies from that of the benchmark performance company. It is worth considering if either position, in the light of the particular facts for each company, means that customers should pay more than our benchmark efficient costs.

1.32 Our final determination for Yorkshire Water recognised and rewarded efficient forecast costs where they were submitted, including allowing almost £49 million more than the company requested for its residential retail services. Our final determination protects customers from paying more than they should.

Allowed return

1.33 Our final determination set an allowed return of 2.96% (in CPIH terms), which we consider provided a reasonable return for an efficient company based on the market evidence at the time. While accepting that required returns have fallen since PR14, Yorkshire Water states that we set the allowed return too low. In its statement of case, the company sets out a number of aspects of the calculation of the allowed return where it disagrees with the approach we took in the final determination and suggests alternative ranges for many of the parameters used in the calculation.

1.34 **Our allowed return provides a reasonable return for an efficiently-financed company**, based on up-to-date evidence of prevailing financing conditions over 2020-25. This is supported by data on listed company share prices following final determinations, which implies investors expect outperformance on the cost of capital as well as other elements. Recent evidence on the risk-free rate, cost of new debt, and equity beta supports our view that the allowed return is not understated.

1.35 **Our approach is balanced and consistent with previous price reviews.** For estimating the cost of equity we used the established capital asset pricing model (CAPM). Our index-based approach to setting the allowed cost of debt is also similar to that used for PR14. For less observable parameters (total market return, and equity beta) we reflected uncertainty and company views by considering a wide range of evidence and selecting from the middle of the plausible range. For more observable parameters (risk-free rate, and cost of debt) we were guided by more recent market data, on the grounds that evidence for mean reversion or convergence to equilibria is weak.

1.36 We provide more detail on this in chapter 6 below, and in our 'Risk and return – common issues' document.

Balance of risk and return

1.37 Yorkshire Water argues that the final determination results in a disconnect between risk and return and an asymmetric package of measures which means the notionally efficient firm is not investable. The company claims our approach

to incentives and rewards means it is facing significant penalty exposure in that encourages the avoidance of penalty rather than service improvement.[5]

1.38 We disagree with the company's assertions. The final determination provided a reasonable allowed return for an efficient company, based on the application of an established methodology and using the market evidence available at the time we made our determination. It provides Yorkshire Water with significant scope to earn upside from outperformance with slight positive skew overall to its risk range. **We are satisfied that our final determination for Yorkshire Water provides an appropriate balance of risk and return**.

1.39 Recent reviews of the sector highlight the need for regulators to explicitly account for information asymmetry.[6] Yorkshire Water had significant opportunity through the PR19 process to convince us of the need for the costs requested in its business plan, which it failed to do. In our view it has not corrected these evidential deficiencies in its statement of case to the CMA.

1.40 Yorkshire Water outperformed the cost allowances we set in all of the last four control periods. Yorkshire Water, if efficient, can continue to deliver its commitments and obligations to customers within the cost allowances we set, with incentives to outperform. We discuss these issues further in the 'Risk and return – common issues' document.

Financeability

1.41 Yorkshire Water claims our determination fell short of providing assurance the company needs that it would be able to raise the necessary finance because its covenants exclude the benefit, and two credit rating agencies disregard, accelerated revenue. This means its interest cover remains well below the threshold for a Baa1/BBB+ credit rating.[7]

1.42 **Our final determination provided Yorkshire Water with a reasonable return if it met the cost allowances and performance commitments** set out in our determination. The allowances and performance commitments were set on the basis of a notional, efficient company and were intended to be stretching but

[5] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp. 2-3, paragraph 11
[6] For example, the National Infrastructure Commission (NIC) stated in 2019 that regulators 'should take direct account of information asymmetries' when setting cost allowances and the allowed return on capital. See National Infrastructure Commission, 'Strategic investment and public confidence', October 2019
[7] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp. 79-80, paragraph 265

achievable. Evidence since our determination supports our view that a company with the notional capital structure could maintain a credit rating that is two notches above the minimum of the investment grade.

1.43 Yorkshire Water **objects to the use of revenue advancement in order to meet a notional financeability constraint**. The financeability constraint arises as result of the cash flow profile in Yorkshire Water's determination and **the £85 million cash flow profiling adjustments we made more fairly balanced customer interests** than increasing costs to customers through raising the allowed returns.

1.44 The company claims our determination restricts the appetite of debt investors, increases the sector wide cost of debt and adversely affects the sector's financial resilience.[8] Evidence from the traded value of listed company share prices supports that there is clearly an appetite for investment in the sector. To the extent that Yorkshire Water's claims are influenced by its past financing choices, this is a matter for the company and its investors.

1.45 We set out our response to Yorkshire Water's arguments around financeability in chapter 6 below, 'Aligning risk and return', and cover key issues around financeability raised by multiple disputing companies separately in the 'Risk and return – common issues' document.[9]

Gearing outperformance sharing mechanism

1.46 Yorkshire Water claims that introducing a gearing outperformance sharing mechanism was an error. Its arguments include that it is incorrect that high gearing generates outperformance[10] and that the gearing outperformance sharing mechanism is harmful to Yorkshire Water and its customers because of the pressure it adds to the company's investability. [11]

1.47 The gearing outperformance mechanism aims to address a long held concern that companies and their investors enjoy all the benefits of adopting financial structures where gearing levels are well in excess of the notional level, with little evidence of benefits to customers. We consider that in the absence of

[8] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 80, paragraph 268
[9] Ofwat, 'Reference of the PR19 final determinations: Risk and return – response to cross-cutting issues in companies' statements of case', May 2020, chapter 4.
[10] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp. 76-77, paragraph 251
[11] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp. 78-79, paragraph 259

benefit sharing, the regulatory arrangements could distort company incentives on choosing financing structures without full consideration of the potential impacts on customers and wider stakeholders.

1.48 We set out our response to Yorkshire Water's arguments around the balance of risk and return in chapter 6 below, 'Aligning risk and return', and cover common key issues around the balance of risk and return raised across the disputing companies separately in the 'Risk and return – common issues' document.

Wholesale revenue forecasting incentive mechanism

1.49 Yorkshire Water claims the implementation of our PR14 wholesale revenue forecasting incentive mechanism (WRFIM) was unsound. It asks the CMA to overwrite the WRFIM inputs due to an error it says it made in its PR14 business plan submission, allowing it £44 million more revenue as a result.

1.50 The PR14 WRFIM was an incentive for forecasting accuracy, the reward or penalty of which was derived by comparing outturn revenues with those forecast at the time of the PR14 business plan. Yorkshire Water argues it made an error reporting forecasts in its PR14 business plan data. During each of the years of AMP6 Yorkshire Water provided the annual outturn data in a way that shows the extent of the alleged error. However, at no point did it provide business plan forecasts for those outturn values to be compared with, hence the solution proposed by Yorkshire Water annuls all power of the incentive. As we said at the final determination,[12]

> 'To ensure a level playing field with other companies, we can only use forecasts, and therefore errors, that can be proven with data made available at the time of the submission of PR14 business plans'.

1.51 Yorkshire Water proposes a solution that increases its revenues by £44 million which it considers to be the impact of the error. However, it takes no account of the knock on consequences of the alleged error in the PR14 final determination. We calculate the allowed revenues would have increased, but by a lower amount (£27 million) and that the final 2019-20 regulatory capital value (RCV) would have reduced by £10 million. Yorkshire Water's proposition does not protect customers from the full impact of the alleged error it made in its PR14 business plan. Our approach in the final determination was not to overwrite the inputs to WRFIM and not to allow the additional £44 million

[12] Ofwat, 'PR19 final determination: Yorkshire Water – accounting for past delivery additional information', December 2019, p. 7.

revenue the company requested. Neither did we reduce the closing RCV value for 2019-20. We considered our approach to be a straightforward and appropriate way of dealing with this issue and protecting customers. We provide further information in chapter 7 below.

Conclusion

1.52 We consider that Yorkshire Water is misguided in asking for a redetermination of its PR19 price review. It seeks to characterise Ofwat as over focused on reducing bills and the short term, and suggests that, in doing so, we have made unreasonable demands on its performance with an inappropriately low cost allowance.

1.53 As we set out in this document and elsewhere, this is a gross mischaracterisation of our approach and the outcome of our price review decisions. In its statement of case, the company takes many points out of context and wrongly invites the CMA to look at them in isolation. It also seeks to portray reasonable and multi-factorial decision-making by Ofwat, in the proper exercise of its discretion, as hard-edged errors. It is wrong to do so. In each case, we have good reasons for stepping in on behalf of Yorkshire Water's customers. They deserve a better service and continued efficiency from their water company, and our final determination aims to deliver that. And customers should not be left to bear the consequences of the company's risky and complex highly geared financing arrangements, which were used to fund dividends and loans to shareholders.

1.54 In their statements of case, companies do not have an incentive to draw attention to instances when we may have made decisions which lean in their favour. This creates a risk that aspects of our determination which were comparatively generous, and make the determination appropriate in the round, will lose the prominence they need amidst the detail of the numerous issues raised by the company. We encourage the CMA to consider Yorkshire Water's redetermination in the round.

Structure of our Response to Yorkshire Water's statement of case

1.55 This executive summary is structured so as to address Yorkshire Water's points in the order in which the company has raised them. The remainder of the document is structured broadly to group issues in the way Ofwat has done in its

final determination. Chapter 2 addresses some general issues, before chapters 3 – 7 address securing cost efficiency (chapter 3), outcomes for customers (chapter 4), overall stretch across costs and outcomes (chapter 5), aligning risk and return (chapter 6), and past delivery (chapter 7).

1.56 We provide a summary table at the beginning of each of chapters 3-7, listing Yorkshire Water's arguments, and indicating where these are dealt with in this document and, where relevant, in other documents which form part of our response. We hope that this provides the CMA with the most helpful way in which to navigate through and group together the issues Yorkshire Water has raised. We also seek to provide the CMA with a consistent structure across our responses to the four disputing companies.

Additional comment

1.57 As we submit our response we continue to recognise the ongoing situation regarding Covid-19. We note that Yorkshire Water acknowledges its potential impacts on the redetermination process in its statements of case. We consider the potential impacts on the process in more detail in chapter 1 of our 'Introduction and overall stretch' document.

2. General issues

Meeting our duties in the round

2.1 In its statement of case[13] Yorkshire Water argues that we were focussing on reducing bills, and in doing so have failed to meet our primary and secondary duties. It claims we have failed in our primary duty to protect both current and future consumers. It further claims we have failed in our resilience and sustainability duties by focusing on short-term cost reductions which will have long-term detriment. It also claims we have failed our financing duty, as it considers the final determination to be not financeable.

2.2 Our statutory duties require us, in summary, to set price controls in the manner we consider is best calculated to:[14]

- further the **consumer objective** to protect the interests of consumers, wherever appropriate by promoting effective competition;
- secure that **companies properly carry out their functions**;
- secure that the companies are able (in particular, by securing reasonable returns on their capital) to **finance the proper carrying out of those functions**; and
- further the **resilience objective** to secure the long-term resilience of companies' systems and to secure that they take steps to enable them, in the long term, to meet the need for water supplies and wastewater services.

2.3 These are our primary duties. They are equal in weight and we must satisfy them all in the decisions we make. Subject to those duties, we also have duties to, among other things, promote economy and efficiency and contribute to sustainable development.[15]

2.4 We must also determine price controls for Yorkshire Water in accordance with the statement of strategic priorities and objectives for Ofwat from the UK Government.[16]

[13] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp.15-18, paragraphs 42-57
[14] Section 2(2A) of the Water Industry Act 1991.
[15] Section 2(3) of the Water Industry Act 1991.
[16] UK Government, 'The government's strategic priorities and objectives for Ofwat', September 2017. We set out more detail on how the PR19 final determinations delivered the UK Government's strategic priorities in UK Government priorities and our 2019 price review final determinations.

2.5 In reaching our final determination we are satisfied that we acted in accordance with our statutory duties and that our final determination ensures that the company has adequate funding to properly carry out its regulated business, including meeting its statutory and regulatory obligations, and to deliver the outcomes within its final determination. In chapter 3 of our 'introduction and overall stretch' document we set out in more detail what the duties comprise and how, in our submission, they are to be interpreted. We also address there the main common issues which the disputing companies wrongly seek to portray as raising a breach of duty. These are:

- the duties and strategic priorities;
- time frame (short term v long term);
- prioritisation of objectives (consumer v resilience);
- cost allowance v outcomes;
- the financing duty and financeability; and
- the role of customer preferences.

2.6 We do not consider that it is helpful or accurate to characterise each such disagreement as a 'hard-edged' question whether we have failed to meet our statutory duties. The reality is that these are **simply disagreements as to the merits of decisions that Ofwat made in its final determinations**. The decisions in question were taken in the light of all of the circumstances (including our experience of the sector and the evidence submitted to us), and as part of the balance that we struck between various interests and policy considerations; in short they were the result of an exercise of discretion.

2.7 The CMA, too, will be exercising its discretion in a way it considers is best calculated to meet the statutory duties, and which accords with the UK Government's strategic priorities and objectives. The CMA will have before it information that was not available to us at the time of our final determinations, and will have to take that into account. It may be that the CMA, after considering all of the information and circumstances, reaches a different view on certain points to that which we reached, or decides to strike a different overall balance. That is simply a reflection of the nature of the many (and complex) decisions that are taken in reaching a final view on each company's price controls. It does not detract in any way from the fact that we have given careful and conscientious consideration to our statutory duties and are confident that we have fulfilled all of them.

2.8 **Time frame (short term versus long term)** Yorkshire Water's suggestion that our objective was 'focusing on reduction in customer bills' over long-term resilience

and sustainability'[17] is ill-founded. We did not have any overriding short-term aim as Yorkshire Water claims, but took a balanced view of our duties as a whole. In particular, affordability was only one of our key themes for PR19, which also included great customer service, long-term resilience in the round, and innovation,[18] and the public statements made by Ofwat throughout the PR19 process were consistent with this balanced approach to meeting our objectives in the round. For instance, David Black, our Senior Director of Water 2020, said:

> 'Bills aren't the only thing that matter to customers. We look at resilience in the round, which includes operational, financial and corporate resilience.'[19]

2.9 It is also a blatant mischaracterisation of our position to imply that we treated resilience as if it were not a necessary element of the price control settlement ('furthering the resilience objective is not discretionary').[20] Resilience is not a novel issue and we have always treated resilience as an important element of our other duties, and embedded it in decision making. As noted above, **long-term resilience in the round** was one of our four key themes for PR19, and our methodology and each of our decision documents provide a clear audit trail of how the need for resilience has been recognised and given effect throughout the process.[21] Nothing in the resilience objective relieves the companies from the requirement to demonstrate efficiency, or offers a blank cheque for future expenditure.

2.10 **Efficiency and evidence** It is a false dichotomy to suggest that the choices available to Ofwat (and now, therefore, to the CMA) are between achieving short-term savings and delivering long-term investment. **Customers both now and in future are entitled to expect that they should fund only expenditure that is efficiently incurred**. We agree with the statement by the CMA in the Bristol Water determination of 2015 that:

> '…we considered that the duty of securing that the functions and activities of a water company are properly carried out and the duty to further the consumer objective themselves implied that we should

[17] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp. 17-18, paragraph 55.
[18] Ofwat, 'PR19 Final Determinations: Policy Summary', December 2019, p. 19
[19] Ofwat, Speech by David Black, Westminster Energy, Environment and Transport Forum, June 2018
[20] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp. 15-16, paragraph 45.
[21] For example, see Ofwat, 'Reference of the PR19 final determinations: Overview', March 2020, pp. 45-46.

> consider the need for these functions to be carried out efficiently, irrespective of the further duty to actively promote economy and efficiency.'[22]

2.11 This provides the answer to any suggestion that by focusing on the requirement for companies to evidence the efficiency of their expenditure, Ofwat elevated a secondary duty to promote efficiency and economy[23] over its primary duties.[24] Challenging companies to demonstrate that their proposed expenditure is efficient is **intrinsic to our primary statutory duties**.

2.12 **Finance duty and financeability** Yorkshire Water seeks to interpret the financing duty in section 2(2A)(c) of the Water Industry Act 1991 as a two-stage test expressed in the language of profits, cash flows and investment grade credit ratings – 'Failure to meet at least one of these limbs would mean that the efficient firm is not 'financeable''.[25] The company claims that its two-stage test is 'the established interpretation of this primary duty'.[26] But no legal precedent 'establishing' the interpretation is cited and none exists. In fact, this interpretation is subject to two errors.

2.13 First, it seeks to read into the statute things which are not there. The wording of the financing duty has not changed materially since the Water Act 1989 under which the water industry was privatised.[27] There is no evidence that Parliament, at the time of privatisation, was thinking of the application of interest cover ratios or alternative financeability metrics to the water sector. Nor was it likely to have done so. The use of those metrics came later, as regulatory methodologies developed. There is no basis for reading them into the statute as if they reflected Parliamentary intention. The words of the financing duty mean what they say in plain English – no more and no less.

2.14 Second, this interpretation seeks to reconstitute the financing duty as a sequence of binary pass or fail tests, editing out the need for regulatory judgement that is made explicit in the statutory language. The intended

[22] CMA, 'Bristol Water plc – A reference under section 12(3)(a) of the Water Industry Act 1991 – Report', October 2015, p 38, paragraph 3.4.
[23] Section 2(3)(a) of the Water Industry Act 1991.
[24] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp.17-18, paragraph 55.
[25] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 16, paragraphs 46-47.
[26] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 16, paragraphs 46.
[27] Section 7(2)(b) of the Water Act 1989, which was subsequently carried forward into the Water Industry Act 1991.

implication is clear: if a financeability ratio appears under strain by reference to a credit rating agency's expectations, it means that we have failed one or other of the tests and must be in breach of the duty. There is no basis for this approach in the statute. It is misconceived, and it would be inappropriate for the CMA to adopt it.

2.15 Yorkshire Water's criticisms, including the argument that there should be a 'fair bet',[28] amount in substance to disagreement with the use of our discretion in relation to the cited components of our final determination. We respond to these criticisms in more detail in relation to:

- cost allowances in chapter 3 and 'Introduction and overall stretch', chapter 4;
- the balance of risk in chapter 4 and our 'Risk and return – common issues' document; and
- financeability and the cost of capital in chapter 6 and 'Risk and return – common issues'.

Engaging customers

2.16 In our PR19 methodology we set out our expectations that companies should demonstrate ambition and innovation in their approach to engaging customers as they develop their business plans. This included direct engagement with customers to develop a package of performance commitments and outcome delivery incentives.

2.17 We expected customer challenge groups to provide independent challenge to companies and independent assurance to us on: the quality of a company's customer engagement and the degree to which this is reflected in its business plan. As we explained in our Reference of the PR19 final determinations,[29] we did not expect customer challenge groups to endorse a company's overall business plan, nor did we expect them to act as a substitute for the views of customers. We are currently considering the future role of customer challenge groups (or equivalent) for PR24, including how to better promote the independence of customer challenge groups from companies.

[28] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020; April 2020, p. 83, paragraph 280.
[29] Ofwat, 'Reference of the PR19 final determinations: Overview', March 2019, p. 33

2.18 In its statement of case,[30] Yorkshire Water outlined its approach to customer engagement, noting that at the initial assessment of business plans we assessed the company's customer engagement to be 'high quality'. The company stated that it was therefore 'surprised and disappointed' that we changed our approach of 'reliance on customer feedback' and disregarded its previous recognition of regional differences arising as a result'.[31]

2.19 We do not agree that our original approach was based on a 'reliance on customer feedback.' As we set out in our Final Methodology,[32] the customer research provided by companies is just one of the inputs we asked companies to consider in setting stretching performance commitment levels (including cost benefit analysis, comparative and historical information, minimum improvement possible, maximum level attainable and expert knowledge). Accordingly, in assessing companies' proposed performance commitment levels we have applied a wider set of tests than just evidence of customer support.

2.20 This approach recognises that there are areas where customers are not best-placed to determine whether a company's business plan is appropriate. This is particularly the case for determining whether companies' proposed performance commitments are stretching but achievable. In particular, customers do not have access to the in-depth analysis of comparative and historical performance information and engineering expertise that we applied to assess performance commitment levels.

2.21 In its statement of case Yorkshire Water claims that its performance commitments and outcome delivery incentives (ODIs) are in line with customers' expectations and that we intervened to produce a performance commitments and ODI package that does not meet the needs of Yorkshire Water's customers, present or future.[33] Similarly it argues that our approach to intervening is flawed because it moves ODI rates 'arbitrarily' close to the industry average and replaces the views of Yorkshire Water's customers with our own view.[34]

2.22 Firstly, we note that in some cases **our interventions were made to better align the company's ODI rates with the results of its own valuation research** ie. to

[30] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp. 24-27, paragraphs 76-84
[31] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 27, paragraph 84
[32] Ofwat, Final Methodology Appendix 2 Delivering Outcomes for Customers, December 2017, p. 50
[33] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 80, paragraph 152.
[34] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 58, paragraph 177.

remedy cases where the company misrepresented the results of its underlying research, for example due to poor quality triangulation.

2.23 Secondly, it is important to recognise that companies' customer research varies in quality and can only ever imperfectly capture customers' actual preferences. It would therefore be a derogation of our responsibility as a prudent regulator not to scrutinise and, where appropriate, challenge the results of companies' customer research, based on the wider set of information available to us (such as historical and sector comparative information). We also consider the extent to which the company has used the information as the basis for its business plan.

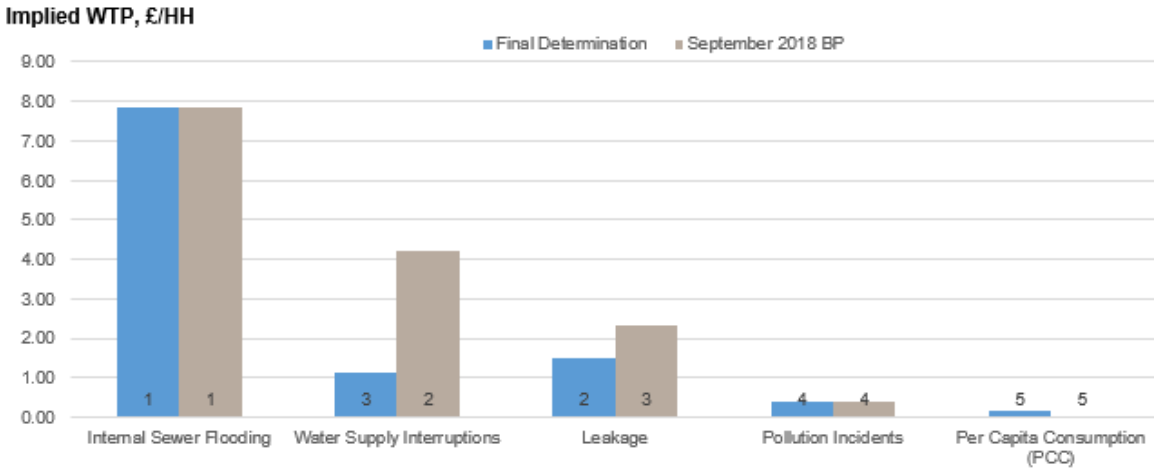
2.24 We do not accept that our interventions were arbitrary. We consider the interventions we made were targeted and proportionate based on the wider set of information available to us (such as comparative information) that was not available to either the company or its customers.

2.25 Accordingly, we observe that our interventions have largely preserved the pattern of preferences implied by the ODI rates in Yorkshire Waters' September 2018 business plan. For example, figure 2.1 below compares the ranking of customers' willingness to pay across the five key customer-facing common performance commitments as inferred from ODI outperformance rates.[35] This shows that contrary to Yorkshire Water's assertions that our interventions have undermined the ODI package it developed with customers, **the pattern of preferences across customer facing performance commitments is in fact largely respected by our interventions**.

2.26 Whilst we did make a material downward adjustment to the company's proposed water supply interruptions rates, this intervention was driven by our assessment of the companies' triangulation of the marginal benefit component of its ODI rate for water supply interruptions, in which the use of outlier willingness to pay appeared to be driving a high triangulated value. Our intervention here was simply to set the company's ODI rates using the willingness to pay value from the company's own main stated preference customer research. As such we consider the resulting rate is in fact a better reflection of its customer preferences than the rate originally proposed by Yorkshire Water.

[35] Using the standard formula for ODI outperformance rates of ODI rate = Marginal benefit x 0.5

Figure 2.1: Comparison of implied willingness to pay between Yorkshire Water's September 2018 business plan and final determinations.



* Data labels denote implied preference ranking across five customer facing common PCs.

2.27 Similarly our intervention in Yorkshire Water's per capita consumption ODI was driven by the fact that it was not at all based on its customers' valuation for reducing per capita consumption. Instead the company applied its water supply tariff to a litre/head/day of water consumption. As such it cannot be the case that our intervention supplanted the views of Yorkshire Water's customers.

2.28 Yorkshire Water argues that a clear example of where we disregarded customer views was with respect to its ODI underperformance and outperformance rates for leakage.[36]

2.29 We do not accept that we disregarded the views of Yorkshire Water's customers in intervening in the company's proposed ODI rate for leakage. We observed that, despite proposing the most stretching leakage reduction performance commitment level in the sector, the company's proposed underperformance ODI rate was materially below the industry average. The proposed underperformance rate was also below its corresponding ODI rate for the 2015-20 period, implying a lower level of customer protection for the 2020-25 period, despite a more stretching leakage reduction target.

2.30 The rate we set in our final determination was derived by triangulating across the company's proposed rate in its September 2018 business plan, its ODI rate for the 2015-20 period and the sector average rate. It therefore continues to make use of the results of the company's customer research, but also

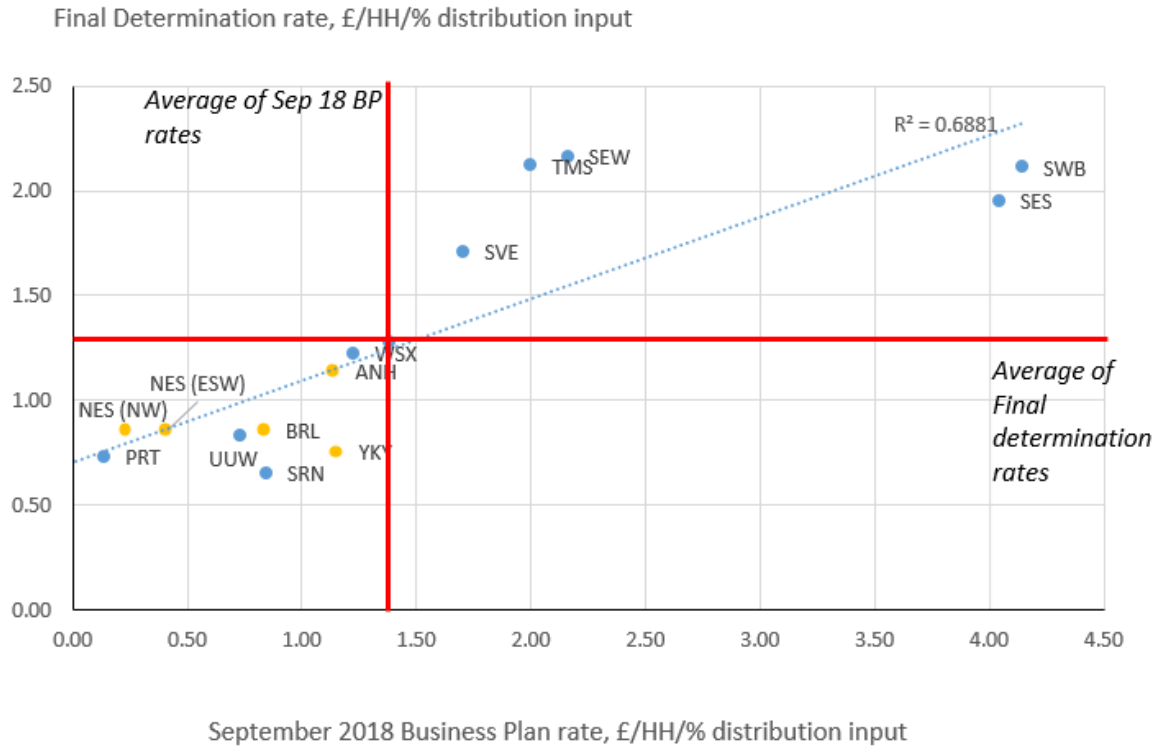
[36] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 59, paragraph 181.

incorporates a wider set of information which we consider increases the robustness of the rate.

2.31 As set out in figure 2.1 above, our intervention broadly respects the relative ranking of customer preferences for leakage reduction compared to the other customer-facing common performance commitments as implied by the rates in the company's September 2018 business plan.

2.32 Our intervention also respects the relative distribution of customer preferences across companies for leakage (see figure 2.2 below). The company's ODI rate remains below the industry average both before and after our interventions (as depicted by its position in the bottom left quadrant of the chart). It is therefore not the case that we disregarded the views of Yorkshire Water's customers. Similarly, where companies proposed ODI rates which were above industry average in their September 2018 business plans, the ODI rate in the final determinations remains above industry average (as depicted by the top right quadrant of the chart). There are no cases where a company proposed a rate below industry average but received a rate above industry average and vice versa (as depicted by the empty quadrants in the top left and bottom right of the chart).

Figure 2.2: comparison of distribution of implied willingness to pay for leakage across companies, before and after our final determination interventions



Notes: (1) We use 'YKY' to denote Yorkshire Water in figure 2.2 above.

(2) As per our construction of 'reasonable ranges', we exclude companies which have not appropriately used customers' valuations as the basis for setting their ODI outperformance rates, on the grounds that the resulting rates are neither comparable across companies nor representative of underlying customer preferences.

2.33 Finally, we note that recent research by CCW revealed that (88%) of Yorkshire Water's customers found our draft determination plan and bill reductions acceptable, comparable to the results of the company's research findings on overall plan acceptability (86%).[37]

Setting bills for customers

2.34 In December 2017, we set out our early view on cost of capital in our PR19 methodology. We identified that the significant reduction in the cost of capital provided headroom for bill reductions and more investment in resilience and service improvement.

2.35 We did not have an end position on bills in mind when we applied our PR19 methodology. Bills, or more properly total revenues as we set revenue controls and not price controls, are a function of the decisions we took on expenditure, allowed return and the amount of money recovered in period and over time. Bills are therefore a product of the other decisions and not an end in themselves.

2.36 We set out in figure 2.3 below how the different aspects of Yorkshire Water's bills changed between 2019-20 (year five of AMP6) and 2024-25 (year five of AMP7) according to our final determination before taking into account inflation. Here we show that some aspects of our determination have increased bills since 2019-20 and these are balanced by other aspects of our determination that have decreased bills.

2.37 For Yorkshire Water, the upwards impacts on bills between 2019-20 and 2024-25 were due to:

- an increase in average totex and natural PAYG rate; and
- a larger RCV and increased runoff of that larger RCV.

2.38 Its bills decreased in 2024-25 primarily due to:

- a lower allowed cost of capital;
- a higher number of customers to share the costs between;

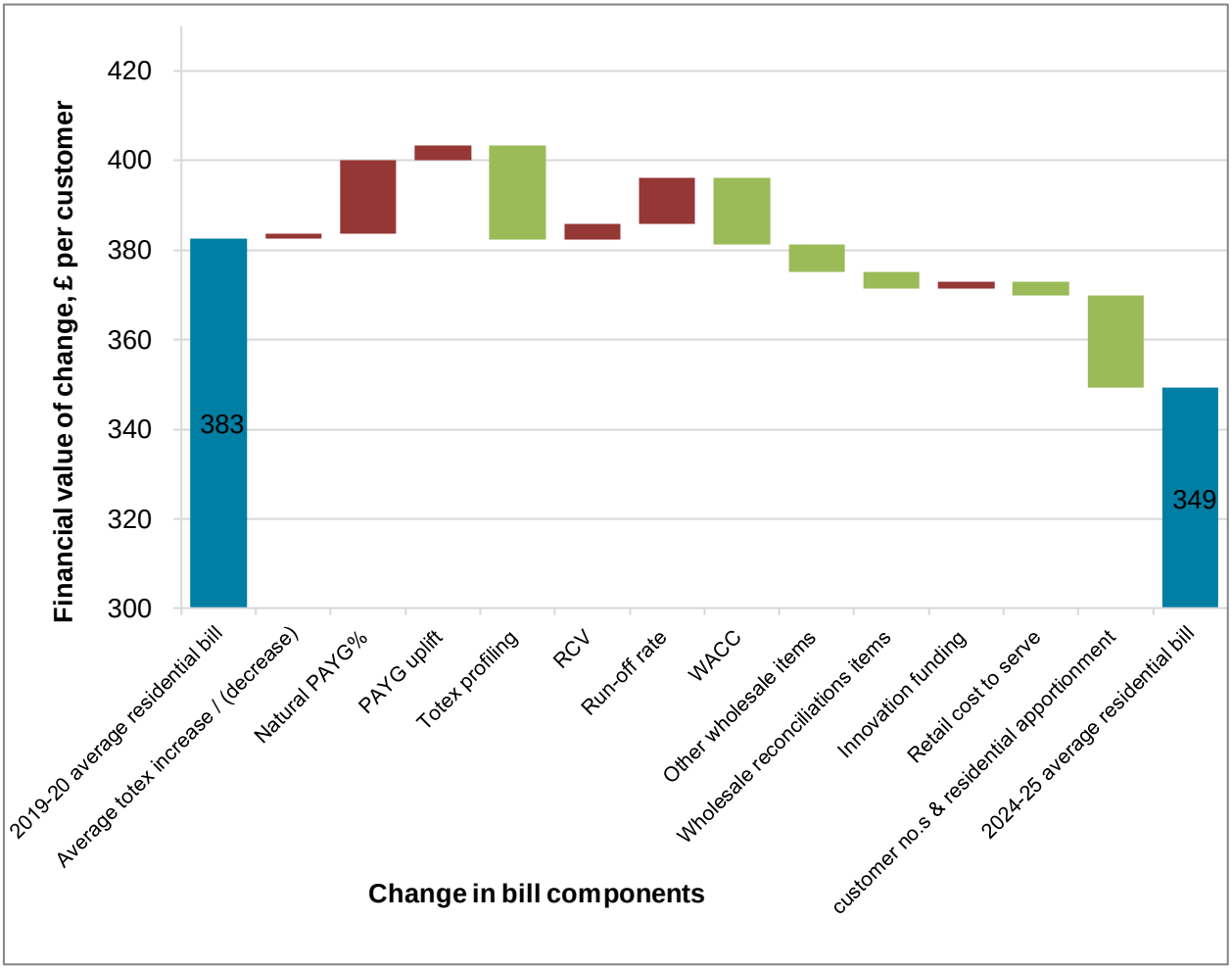
[37] CCW, PR19 – Draft Determination Research, February 2020

- profiling of the 2020-25 expenditure in line with company proposals making 2024-25 the lowest cost year out of the five; and
- a reduction in tax the company expects to pay between 2019-20 and 2024-25.

2.39 So, in spite of Yorkshire Water arguing that we have focused on bill reduction at the expense of investment, we have increased the allowance for investment at PR19. The bill reduction is driven by a lower cost of capital, the increasing number of customers and profile of spending over the period.

2.40 After taking into account inflation we would expect to see average bills remain stable across the five year period and remain broadly consistent with those in 2019-20.

Figure 2.3: A breakdown of the factors in Yorkshire Water's bill changes between 2019-20 and 2024-25 in our final determination



Note: we calculate the return on RCV using a real allowed return on capital. We used allowed return on capital expressed in real RPI terms for PR14, while we expressed it in real CPIH terms for PR19.

Using real CPIH terms allowed return on capital reduces the fall in bills at PR19 from lowering the nominal allowed return on capital. This is because the real CPIH terms allowed return on capital is around 1% higher than the allowed return on capital expressed in real RPI terms.

3. Securing cost efficiency

Summary

3.1 Our final determination allowed efficient costs for all but two very small items in Yorkshire Water's business plan submission, as we explained in our introduction to the CMA.[38] We have not otherwise reduced scope from the company's plan. Our final determination cost allowance was **derived from benchmark models and a thorough review of the evidence the company provided** in support of claims for funding in addition to modelled allowances. It was, in our view, an **efficient allowance for Yorkshire Water to meet the performance measures we set in the final determination**.

3.2 As we set out in our introduction to the CMA,[39] our final determination allowed wholesale and retail total expenditure (totex) of £4,442 million. This was:

- £119.1 million higher than in our draft determination and
- £304.0 million lower than requested in the company's representation on our draft determination.

3.3 Our final determination allowed Yorkshire Water £905 million to invest in improvements to service, resilience and the environment. Key parts of this allowance are:

- £772 million to improve the environment by efficiently delivering its obligations as set out in the whole Water Industry National Environmental Programme (WINEP) including providing phosphorus removal at treatment sites treating wastewater from more than 4 million people. This includes £36 million to handle the additional wastewater bioresources resulting from its WINEP;
- £51 million to address the impact of deteriorating raw water quality;
- £22 million to install new water meters; and
- £16 million to address Hull (resilience) sewer flooding.

3.4 Table 3.1 highlights the key issues raised by Yorkshire Water in its submission in relation to costs and a summary of our response to each of those points.

[38] Ofwat, Reference of the PR19 final determinations: Explanation of our final determination for Yorkshire Water, April 2020, paragraph 1.15.
[39] Ofwat, Reference of the PR19 final determinations: Explanation of our final determination for Yorkshire Water, April 2020, paragraphs 2.11 and 2.12

Table 3.1: Key issues on costs raised by Yorkshire Water in its submission

Key issue in Yorkshire Water's submission	Summary of our response
Cost models do not control for performance. Yorkshire Water argues that our cost models are flawed because they do not account for performance measures (Statement of Case, paragraphs 32-35,146-148). It claims that we materially underfunded the company for not sufficiently controlling for outcomes in the cost models.	Our base cost econometric models do not include a specific driver for service quality. This is because service quality is under management control and including it as a driver would lead to perverse incentives. We do not find that Yorkshire Water's alternative model specifications are robust nor sufficiently justified with engineering and operational understanding. We explain further below, and further details are outlined in chapter 3 of 'Cost efficiency – common issues', and in paragraphs 3.16-3.30 below.
Econometric cost models use inappropriate benchmarks and efficiency assumptions. In its statement of case, (paragraphs 143, 190-194, 197 a, b, and Annex 10) Yorkshire Water states that our models are unable to distinguish inefficiency from other factors. It argues that it was wrong of us to move its choice of benchmark from the upper quartile company to the fourth ranked company in water and the third ranked company in wastewater.	We have set the catch-up benchmark at a comfortably achievable level. The move was supported by clear evidence that the upper quartile company was no longer providing a stretching enough challenge, and reflected better information disclosed by companies on their efficient costs. 8 out of 17 companies are still forecasting more efficient costs than our efficient benchmark, which indicates there is significant scope for outperformance of our cost allowance. We explain further below, and further details are outlined in chapter 3 of 'Cost efficiency – common issues' and in paragraphs 3.31-3.54 below
Enhancement models use inappropriate benchmarks. Yorkshire Water states in paragraphs 195-196 that our choice of upper quartile benchmark in enhancement is also problematic due to the models we used which were simple and with a low number of observations.	Using an approach more challenging than average efficiency for enhancement costs was upheld as an appropriate way to set cost allowances at PR14 by the CMA. Our approach protects customers from paying more than they should for enhancement programmes. We explain below in paragraphs 3.112-3.118.
Enhancement: WINEP In its statement of case (paragraph 197 c) Yorkshire Water states that the WINEP phosphorus removal model we used to set allowances for companies does not adequately account for differences between the reasons for requiring investment. Some of these reasons require greater investment than others, It also states (paragraphs 300-306) that our final determination potentially has negative environmental consequences, some of those being that it would have to use chemical rather than biological treatment processes risking	We consider that the increase in our allowance for phosphorus removal between draft and final determinations favoured Yorkshire Water and remain of the view that the remaining cost gap is a measure of the company's inefficiency. Yorkshire Water's environmental concerns appear to us overstated. Chemical phosphorus removal is the 'norm' in the UK with the risk of pollution being effectively managed through the permitting process. The seven additional sites where Yorkshire Water claims it will be forced to install chemical removal facilities will increase the total number of sewage treatment works in the country by less than 1%. We provide further information below in paragraphs 3.119-3.139

pollution of watercourses and requiring more chemical delivery tankers on the road.	
Base costs: business rates Yorkshire Water states in paragraph 197 (d) that it has a limited degree of influence over business rates and that we underestimated the value of its wastewater assets when setting the allowance for 2020-25.	We considered that the effects of revaluations and asset additions on business rates were too uncertain to accurately reflect in our allowance. Therefore we allowed a symmetrical uncertainty mechanism to reconcile business rates based on 75/25 (customer/company) sharing rates. We provide more information in paragraphs 3.55-3.60 below.
Forecast of cost drivers. Yorkshire Water states that we did not account for future changes in cost drivers (paragraph 198). In particular, the company argues that we should have adopted the company's forecast of new connections, new mains and booster pumping stations.	Developing independent cost drivers is a fundamental step of our approach to setting efficient allowances. We applied some weight on companies' forecasts during the price review process where we became more confident in the reliability of their forecast, but we do not consider this would be appropriate for drivers such as new connections. We also find that Yorkshire Water's representations on our forecast of cost drivers are selective and do not extent to those drivers where our independent forecasts are benefitting the company. We explain further below in paragraphs 3.61-3.72.
Frontier shift is too high and applied to the wrong costs. Yorkshire Water states that our frontier shift is too high,[40] based on unsustainable historical outperformance[41] and that applying frontier shift to WINEP and unmodelled costs is unjustified.[42]	Our frontier shift of 1.1% is based on a wide range of evidence of frontier efficiency in comparator sectors, reflects uplift from the outperformance companies have achieved through the totex and outcomes framework, and our selection of frontier shift considers embodied technical change. 1.1% is within the range of frontier shifts applied by other UK regulators in recent years, and there is justification including past regulatory practice to apply the frontier shift to unmodelled and enhancement costs. We explain further in paragraphs 3.73-3.94 below.
Real price effects are not all accounted for. Yorkshire Water states our real price effects assessment framework does not account for all real price effects and that we have failed to account for energy, chemicals costs and materials, plant and equipment costs.[43]	Water companies benefit from indexation of price controls to CPIH inflation. We consider that allowances for real price effects should only be made where there is sufficient evidence, given the risk of a negative impact on customers if overestimated and the unreliability of previous forecasts. There is insufficient evidence that a real price effect for energy prices, chemicals or

[40] Yorkshire Water's Annex 09, Oxera, 'Issues with Ofwat's frontier shift assessment in PR19', March 2020, paragraphs 199-200
[41] Yorkshire Water's Annex 09, Oxera, 'Issues with Ofwat's frontier shift assessment in PR19', March 2020, paragraphs 133, 199
[42] Yorkshire Water's Annex 09, Oxera, 'Issues with Ofwat's frontier shift assessment in PR19', March 2020, paragraph 201
[43] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p.67, paragraph 202

	materials, plant and equipment costs is required and an adjustment will weaken company incentives to manage these costs. We explain further in paragraphs 3.95-3.99 below
Flooding investment in Hull and Haltemprice. In Yorkshire Water's statement of case paragraphs 307-319, it states that its proposals to invest in innovative partnership work in Hull and Haltemprice could not go ahead within our final determination cost allowance.	Yorkshire Water does not provide any cost build-up evidence behind its proposal to spend £28.6 million. In our final determination we accepted the evidence of unusual conditions in Hull and Haltemprice which results in customers being at greater risk of sewer flooding. We acknowledge, and are supportive of, the innovative partnership approach to promote new ways of multi-agency collaboration to tackle these local challenges. We made an efficient additional allowance of £16.4 million for the increased risk. We provide more detail in paragraphs 3.100-3.107 below

Considerations for the CMA

3.5 It is important to recognise that the price review is a process affected by asymmetry of information between the companies and Ofwat. Companies can provide evidence to draw attention to areas where they deserve an allowance, but they do not have an incentive to draw attention to aspects of their service which are lower cost than our allowance. During the price review process we received numerous representations and cost adjustment claims from companies for additional costs. We would expect there to be numerous cases where a negative adjustment is warranted, however, we have not received any such representations from companies.

3.6 Similarly, the issues raised in companies' references to the CMA will be focused on areas where companies are arguing for a higher allowance. There is therefore a significant risk that aspects of our final determination which were generous for the company, and make the determination appropriate in the round, will lose the prominence they need amidst the detail of the many issues raised.

3.7 These are therefore flagged here. We also list the decisions which Yorkshire Water is not disputing, and highlight certain other key points which we consider it would be appropriate for the CMA to take into account:

- in residential retail, we assessed the company as efficient and made a final allowance of £321.9 million, £48.7 million (18%) greater than requested in this area;

- in wholesale base water, we assessed the company as relatively efficient and made a final allowance of £1,553.3 million, £17.6 million greater (1%) than requested in this area;
- we made a £35.6 million allowance for a cost adjustment claim to accommodate sludge produced due to WINEP sewage treatment requirements;
- we made a £16.4 million allowance for the company's proposed investment to reduce flooding risk in Hull and Haltemprice, in addition to our sewer flooding base allowance, despite the limited evidence on the scope of its proposed work;
- the company makes representations on some of our forecast of cost drivers in water, but it does not dispute our independent forecasts in wastewater. We calculated that our independent forecasts benefit the company of an additional £17 million allowance in wastewater, compared to a scenario where we used the company's business plan forecasts; and
- for enhancement costs, we allowed the full requested cost on metering (£22.1 million), and made efficient allowances for reducing lead in drinking water (£11.1 million), and water WINEP (£46.2 million).

3.8 We set out the expectation to water companies that they would need to make a step change in efficiency by 2025.[44] We do not consider that customers should pay for inefficiency where their company needs to catch up to an efficient level of performance, or that companies should easily outperform their allowances so that investors could earn higher returns at the expense of customers.

3.9 We suggest that the CMA should approach the final determination for Yorkshire Water in the round, weighting the company's arguments as part of the broader final determination package, which we consider is funding the efficient cost and is stretching but achievable.

Our response to key issues raised by Yorkshire Water

Base costs

3.10 Throughout the price review process, we developed our wholesale econometric models following a robust, transparent and inclusive process. We drew on lessons learned from PR14, and ran working groups with the industry on cost modelling during 2016 and 2017. In March 2018 we published a consultation,

[44] Ofwat, Delivering Water 2020: Our final methodology for the 2019 price review, December 2017, p. 4

which included a wide range of models proposed by us and water companies, as a joined-up industry effort to develop better econometric models for the price review. We took account of the responses and feedback we received when developing our models at the initial assessment of plans, and later reviewed and refined our models following companies' responses to the initial assessment of plans and draft determinations. We published our data, Stata do-files and feeder models transparently during this process, so that companies and other stakeholders could replicate our findings and provide meaningful feedback.

3.11 In its statement of case, Yorkshire Water implies that since it has been judged to be efficient and high performing in previous price reviews it should also be in PR19.[45] We disagree. Our analysis of Yorkshire Water's historical cost data shows that the company has been efficient in water, and its proposed costs for the period 2020-25 are also relatively efficient. However, while the company was relatively efficient in wastewater in the past, the company's forecast expenditure in this area is significantly above the efficient cost.

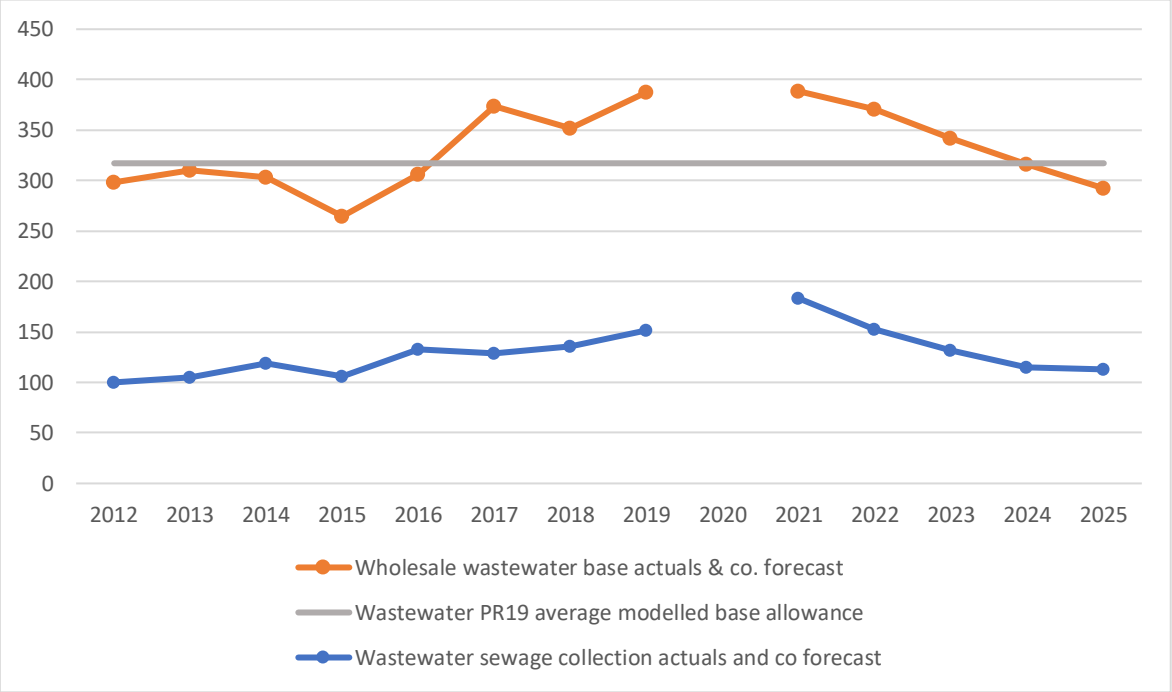
3.12 In figure 3.1 below we show the increase in wholesale wastewater base costs that demonstrate why Yorkshire Water has been efficient in the past but is not in future. We note that this appears to be a temporary increase before the company forecasts costs to return to efficient levels at the end of the business plan period, driven mostly by an increase in sewage collection base costs.

3.13 In our draft determination we used seven years of reported actuals, shown as 2012 to 2018 in the graph above as the input data for developing our econometric models. At this stage Yorkshire Water was shown to be the third most efficient company in our wastewater models, with an efficiency score of 0.99, which means its input costs were 99% of our efficient modelled costs over the same seven year period. However, when we added another year of data, reported to us in 2019, into our models, then Yorkshire Water's efficiency ranking dropped to seventh most efficient of ten, with a score of 1.03. All other companies' rankings were stable, moving by typically one place if at all. This drop is due to the step up in expenditure in the years immediately leading up to the PR19 process and aligns with Yorkshire Water's statement of case which

[45] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp.6-11,13-14, paragraphs 21-27; 38-39

explains that it stepped up investment to prepare for the performance challenges it saw in the PR19 methodology.[46]

Figure 3.1 Yorkshire Water's wholesale wastewater base costs and our base allowance, £m (2017-18 prices)



3.14 We explain more about the performance of the company and how it has lagged behind its peers in chapter 4.

3.15 In the following sections, we cover the issues the company raised on our approach to modelling base expenditure. Where the issue is cross-cutting among companies, we provide a brief summary here and refer to a more detailed response in our 'Reference of the PR19 final determinations: Cost efficiency - response to common issues in companies' statements of case'.

Key issue – Service quality in base models

3.16 Yorkshire Water claims that, because our base cost econometric models did not take into account service quality, our results are biased and lead to an

[46] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 30, paragraph 92 states 'YWS … began improvements in key areas such as internal sewer flooding and leakage in AMP6, going beyond the targets set in PR14, funded through outperformance, with customer and shareholder support'

efficiency challenge that is not achievable.[47] The company provides an additional report by Oxera in support of its claim, stating that there is evidence that Yorkshire Water's allowance is materially understated, as its alternative models provide the company a further £139 million allowance.[48]

3.17 In this report, Yorkshire Water claims that including service quality cost drivers would allow for better estimates of historical efficiency, and allow to account for the higher costs associated with improving service quality. To remedy this issue, the company presents a set of alternative models which include two service quality cost drivers, namely, leakage volumes measured by deviations from the sustainable economic leakage level per property, and water quality contacts per 1,000 people, which is a measure of the volume of customer complaints relating to specific characteristics of water, such as taste, odour and discoloration

3.18 Overall, we do not find any credible evidence to justify the company's claim that our models inappropriately capture its efficient cost and that its efficient allowance is understated.

3.19 Our econometric models do not include service quality cost drivers for valid economic and statistical reasons, which we discuss at length in chapter 3 of 'Cost efficiency – common issues'.

3.20 In summary, service quality is under management control, which can lead to **perverse incentives**. For example, if higher costs are associated with lower performance levels, then companies will be rewarded, and incentivised to continue underperforming, through the model's cost allowance. Service quality variables also have an **ambiguous relationship with costs.** Further, we tested a number of service quality variables during our modelling development process, but found that these were either not significant or led to perverse incentives.[49]

3.21 We further note that, as part of our March 2018 econometric modelling consultation, companies submitted over 220 models in water and wastewater.[50] **None of the models submitted by the companies included a service quality variable.** We think that this is quite revealing, in particular given that at that early stage of the process, in contrast to the current stage, companies were

[47] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp. 46-47, paragraphs 140-141.
[48] Yorkshire Water's Annex 08, Oxera, 'Integrating cost and outcomes', March 2020.
[49] CEPA for Ofwat, 'PR19 Econometric Benchmarking Models', (March 2018).
[50] Ofwat, 'Cost assessment for PR19: a consultation on econometric cost modelling', March 2018.

much more likely to propose their objective view of models, rather than be motivated to search a model that would close their final determination cost gap.

3.22 The CMA also highlighted reasons for not including service quality cost drivers in econometric models in its 2015 redetermination for Bristol Water.[51] In particular, the CMA made the decision not to include service quality variables such as percentage of mains renewed or relined, number of properties below reference pressure level, leakage, and number of properties affected by unplanned and planned interruptions more than 3 hours, for the reasons outlined above. The CMA stated, "given these issues, it seemed safer to exclude this variable altogether than to include it in the econometric analysis."[52]

3.23 Yorkshire Water's alternative leakage models provide **contradictory results and incentivise perverse behaviours**. The company's leakage variable (distance from the sustainable economic level of leakage) has a positive elasticity, which suggests that higher levels of leakage are associated with higher costs, or in other words **it suggests that lower quality is related to higher costs**.

3.24 This is in contrast with the behaviours and targets that the sector needs to achieve on leakage. This result is also contrary to our alternative leakage modelled specifications, the results from PwC's leakage report,[53] and the arguments from Anglian Water and Bristol Water that marginal costs increase as leakage levels decrease.

3.25 The difference in results may be due to the different approach in which we measure leakage performance. We do not use distance from the sustainable economic level of leakage in our alternative specifications which model leakage, because the sustainable economic level of leakage is a measure influenced by companies' own determinations of costs and benefits and does not represent an objective and homogenous approach across the industry.[54] Instead, we measure leakage relative to a normalised upper quartile performance level. This is a more appropriate and consistent measure of leakage performance and is not affected by a company's assessment of its costs of reducing leakage which may be inefficient.

[51] CMA, 'Appendix 4.2: Supporting information on alternative econometric models', March 2015, pp. 27-29
[52] CMA, 'Appendix 4.2: Supporting information on alternative econometric models', March 2015, pp. 27, paragraph 131.
[53] Ofwat, Final determination models, Base adjustments model, and PwC, 'Funding approaches for leakage reduction', December 2019
[54] Further discussion on inappropriateness of using the sustainable economic level of leakage is in Ofwat, 'Cost efficiency - common issues', chapter 5.

3.26 The models presented by Yorkshire Water may be quite **selective.** Yorkshire Water is one of the poorest performers on leakage in the sector. **A model that has a positive relation between leakage volumes and costs is therefore bound to provide material additional costs for the company.**

3.27 We note that the leakage evidence from the PwC leakage report shows that including leakage reduces Yorkshire Water's allowance by £1 million. In our suite of alternative specifications, which include two leakage models, we also observe that the company receives a lower allowance when controlling for leakage levels. However, we did not make a downwards adjustment in our final determination.

3.28 Finally, we note that where appropriate, and in customers' interests, we provided additional expenditure for companies to improve service. For example, we provided an additional allowance to reduce leakage for high performing companies. We also provided an allowance for Thames Water to improve its performance on unplanned interruptions and for Welsh Water to improve its network water quality. In addition, where companies improve service beyond their performance commitment level they can receive outperformance payments under our outcomes framework. In chapter 2 of 'Outcomes – common issues' we explain why we consider that our base allowance is sufficient for companies to deliver some improvements in service.

3.29 Overall, we find that the company's claim that its allowance is materially understated is not supported by credible evidence. Our set of alternative modelling specifications, which include additional variables based on issues raised by companies, suggest that **our allowance to the company may have been generous, rather than understated.**[55]

3.30 We provide further details on our views on service quality drivers in 'Cost efficiency – common issues', chapter 3.

Key issue – Catch-up efficiency challenge

3.31 Yorkshire Water does not agree with our choice of catch-up efficiency benchmark, which was set beyond the upper quartile level.[56] It argues that our econometric models do not distinguish inefficiency from noise, and that the

[55] Ofwat, Final determination models, Base adjustments model.
[56] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp. 61-62, paragraphs 190-194.

models are likely to result in data errors, omitted variables and other inaccuracies. The company provides additional analysis from Oxera to show that there is a significant level of uncertainty in our econometric models.[57]

3.32 The company also claims that our choice of a more stretching catch-up efficiency challenge was not based on any empirical evidence. It argues that we could have used other approaches such as stochastic frontier analysis to identify true inefficiency.

3.33 To protect the interest of customers, we aim to set cost allowances that are efficient. Benchmarking analysis allows us to identify relatively efficient companies within the sector, and we can use this information to set a catch-up challenge to the less efficient companies in the sector. This replicates a competitive market, where less efficient companies would be unable to charge a premium to customers to cover their inefficiency.

3.34 At any point during the price review process, it is our role to take a step back and reflect on whether our cost allowances are efficient and in the best interest of customers. In particular, in the light of new information that is revealed, or becomes available, during the process.

3.35 After the draft determinations, new information came to light. In particular, we received outturn data for the year 2018-19, which we incorporated to our econometric models. This significantly increased cost allowances as the 2018-19 year is an atypically high cost year, both in comparison to historical data and forecast data (in particular, the sector's annual forecasts in water are 16.2% lower than base costs in 2018-19, and 5.2% lower in wastewater). We also removed non-section 185 diversion costs from our base models. This removed lumpy expenditure and slightly improved the accuracy of our models.

3.36 In addition, **companies reduced their requested costs in their representations to our draft determinations.** We acknowledge that there could have been different reasons for the reductions in companies' requested costs. However, these reductions may be a response to information revealed to the companies during the process, for example information on other companies' costs and our benchmarking assessment, which allowed them to better understand their efficient costs.

3.37 Further, at draft determinations we changed our approach to the calculation of cost sharing rates. We said that we would put 50% weight on companies'

[57] Yorkshire Water's Annex 10, Oxera, 'Issues with Ofwat's approach to determining the cost benchmark', March 2020

August 2019 cost forecasts to determine their cost sharing, so **companies were incentivised to disclose better information about their efficient costs in response to our draft determination**. It would be wrong for us not to act on information disclosed through our incentives, in particular given that it is in essence customers who pay for this improved information.

3.38 Following the new information that came to light after draft determinations, we reviewed whether our base allowances are efficient. We identified that **most companies (12 out of 17) were already outperforming the modelled base cost allowance under the historical upper quartile**. This compared to six companies out of 17 at the draft determinations.

3.39 In addition, the level of the historical upper quartile challenge steadily decreased from the initial assessment of plans to draft determinations, and again following the incorporation of the 2018-19 data after draft determinations, as shown in table 3.2:

Table 3.2: Comparison of the upper quartile challenge at different price controls and different stages at PR19

	Wholesale water	Wholesale wastewater
PR14 final determinations	6.5%	10.4%
PR19 initial assessment	4.8%	3.7%
PR19 draft determinations	4.2%	1.4%
PR19 final determinations	**3.9%**	**1.2%**

3.40 In light of these considerations, we considered that the historical upper quartile challenge no longer provided a suitable challenge to companies' proposed base costs.

3.41 In addition, only Thames Water expressed a concern with the upper quartile catch-up efficiency challenge that we applied in our draft determinations. This suggests that all four disputing companies considered the draft determination catch-up challenge to be appropriate and achievable. Our final determination catch-up challenge, although set at a more stringent level than the upper quartile, is **lower than that applied at the draft determinations** (table 3.2).

3.42 We consider that our decision to move to a more stringent catch up than the upper quartile is not only appropriate, but also completely in line with our PR19 methodology. In our PR19 methodology we said that we would look to strengthen the efficiency challenge of PR14. We said that we would expand the

set of evidence we use to inform our efficient cost baselines and that we would use historical and forward-looking cost performance to identify the most efficient companies in the sector, which will set the benchmark for the rest of the companies. By using all available information to set our cost baselines, we ensure that our baselines are stretching, so that customers do not pay more than necessary for the services they receive. We also said that we would determine the appropriate level of efficiency challenge for the five years of 2020-25 when we set draft and final determinations.

3.43 Overall, our choice of catch-up efficiency challenge for final determination is set at a **comfortably achievable level**. The catch-up challenge was strengthened by only 0.7 percentage points in water compared to the upper quartile level, and by 0.8 percentage points in wastewater. As a result, **eight out of 17 companies are still forecasting more efficient costs than our efficient benchmark.** This suggests that our choice is likely to be conservative.

3.44 We also note that both the water and wastewater catch-up challenges are considerably lower than the upper quartile benchmark set at PR14 (table 3.2 above).

3.45 Yorkshire Water argues that our choice of benchmark was not based on any empirical evidence. We fundamentally disagree with this statement. **Our choice of benchmark was informed, amongst other things, by better information companies disclosed on their efficient costs** in the light of new cost sharing incentives after the draft determinations. It would be wrong for us not to act on information disclosed through our incentives, in particular given that it is customers who pay for this improved information.

3.46 In addition, while model performance alone is not an argument to dismiss evidence in the round, there is **evidence that our models performed better at final determination.** Our analysis indicates that the range of efficiency scores between companies narrowed between draft and final determinations.[58] Therefore, model performance supports our decision.

3.47 However, **we consider that the setting of the catch-up challenge is not only a function of model quality.** The fact that 2018-19 was a high cost year, unrepresentative of historical and forecast costs, and as a consequence our base cost allowance was above that of most companies' forecasts is something that we need to take into account. Rather than not using the 2018-19 data, we

[58] We provide full details of this analysis in Ofwat, 'Reference of the PR19 final determinations: Cost efficiency - response to common issues in companies' statements of case', May 2020, chapter 6

accepted companies' view that we ought to use the latest data but amended the catch-up challenge to address the issue.

3.48 We also have to consider that our benchmarking is done amongst long standing monopolies. Even the relatively efficient companies within this sector are unlikely to be as efficient as companies facing competitive pressure. Our comparative assessment is unlikely to identify maximum achievable efficiency. This relates to the concept of x-inefficiency, which is that that in non-competitive sectors there is a level of inefficiency due to lack of competitive pressure.

3.49 Yorkshire Water considers that we could have used a different modelling approach, such as stochastic frontier analysis, to check whether the catch-up efficiency challenge was appropriate.

3.50 While in theory stochastic frontier analysis is appealing for efficiency analysis, in practice, **stochastic frontier analysis has had limited use in regulatory applications**. Stochastic frontier analysis models are complex and non-transparent for stakeholders who have to engage with our proposals. Stochastic frontier analysis models also require large amounts of data to produce high quality results and are sensitive to assumptions related to the distribution of inefficiency.

3.51 CEPA recommended that stochastic frontier analysis models should only be used when other, simpler, models do not provide sufficiently robust estimates.[59] This view was shared by the CMA in Bristol Water's 2015 redetermination, which also found that stochastic frontier analysis models provided limited additional value.[60]

3.52 Following CEPA's advice, we were able to develop robust, simpler, econometric models using random effects estimation. We therefore did not consider stochastic frontier analysis as part of our PR19 modelling. **The industry welcomed the simplicity and transparency of our PR19 models** as they are easier to understand and assess compared with the PR14 models whilst also capturing a wide range of cost drivers.

3.53 Overall, we consider we have set a catch-up efficiency challenge which is conservative and comfortably achievable, and that our decision was supported

[59] CEPA, PR19 Econometric Benchmarking Models', March 2018
[60] CMA, 'Bristol Water plc – A reference under section 12(3)(a) of the Water Industry Act 1991 – Report', October 2015, pp.110, paragraph 4.193

by clear evidence and reflected the most updated information on companies' efficient costs.

3.54 We provide a more detailed response to this issue, as well as a more detailed response to the technical arguments presented in the report by Oxera, in 'Cost efficiency - common issues', chapter 6.

Key issue - Business rates

3.55 For wholesale water, we calculate each company's expected 2017-18 business rates using the 2017 rateable values supplied by the Valuation Office Agency and the 2017 multiplier set by central government.

3.56 For wholesale wastewater, we calculate each company's expected 2017-18 business rates using the 2017 rateable values supplied by the companies and the 2017 multiplier set by central government.

3.57 We do not take the revaluations due in 2021 and 2024 into account in our allowances. We also do not take into account increases in business rates due to changes in wastewater asset stock in the period 2020-25. Yorkshire Water states[61] that it has a limited degree of influence over business rates and that we underestimated the value of its wastewater assets when setting the allowance for 2020-25.

3.58 In its April 2019 revised business plan, Yorkshire Water stated that the existing estimate for asset extensions equated to a business rates liability of £3.2 million per year.[62] The company had included that liability from 2021-22.

3.59 In its representations to the draft determinations Yorkshire Water stated[63] that a full pass through to customers would not create an incentive for companies to manage business rates effectively. However, since business rates are a form of taxation, a true-up based on 50/50 sharing would do as long as the baseline were corrected.

3.60 We considered that both impacts of revaluations and the liability arising from asset additions had a degree of uncertainty. Therefore we allowed a

[61] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp. 63-65, paragraph 197 (d)
[62] Yorkshire Water, Exhibit 067-081 - IAP response - YKY .CE.A1 Securing cost efficiency, pp. 23-28
[63] Yorkshire Water, Exhibit 033 – YWS DD Representation Cost Efficiency, pp. 45 -50

symmetrical uncertainty mechanism to reconcile business rates based on 75/25 (customer/company) sharing rates.[64]

Key issue – Forecast of cost drivers

3.61 Developing independent cost drivers is a fundamental step of our approach to setting efficient allowances. It is important that we protect customers from the risk that potentially inflated forecasts of cost drivers will feed into our cost estimates and customer bills.

3.62 Yorkshire Water argues that we did not account appropriately for changes in future cost drivers. It argues that, while we relied less on our own forecasts throughout the price review process, we still adopted independent forecasts of new connections, new mains and booster pumping stations.[65] It further argues that we should have used its forecasts of new connections in our growth adjustment.

3.63 We consider that **the company is misrepresenting the rationale of our decisions**. While at the initial assessment of plans we used completely independent forecasts of drivers, throughout the rest of the PR19 process we placed some weight on companies' forecasts where we had more confidence in the reliability of their forecasts, and where we considered this was appropriate.[66]

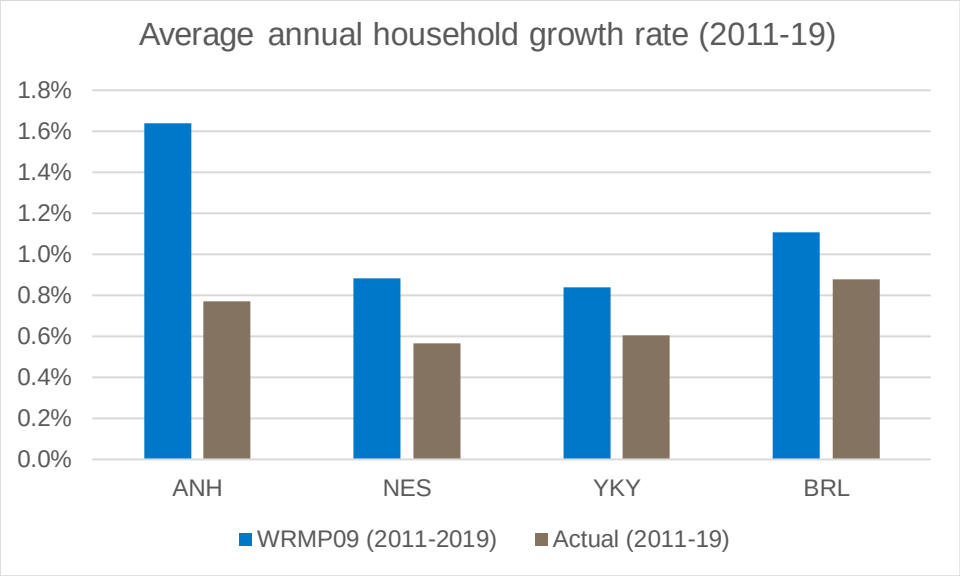
3.64 This is not the case for the forecast of new connections. Companies' forecasts are based on Local Authority data which is a requirement when they develop their water resources management plans (WRMPs). These forecasts tend to be at the upper range of possible estimates of growth rates, as they are used to identify long-term capacity requirements. While this may be appropriate for long-term plans such as water resources management plans, **on a short-term five-year period the use of these forecasts would expose customers to a risk of over-forecasting population growth**. If we were to adopt these forecasts, this would in turn risk overfunding companies for growth that may not materialise.

3.65 Our analysis shows that water resources management plans have historically over-estimated households' growth rates (figure 3.2). We therefore adopted

[64] Ofwat, 'PR19 final determinations: securing cost efficiency technical appendix', July 2019, section 3.2.2
[65] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 65, paragraph 198
[66] Full details on our approach to forecasting cost drivers are given in Ofwat, 'PR19 final determinations: Securing cost efficiency technical appendix', December 2019, pp. 23-25

independent forecasts from the Office for National Statistics, which is a widely recognised source for population projections.

3.66 **Figure 3.2: Comparison of forecasts in water resources management plans and actual average annual household growth rates, 2011- 2019**



3.67 **Our regulatory framework offers companies considerable protection against the risk that our forecasts of new connections might be underestimated**, through the re-set of the price control every five years, the cost sharing mechanism, and in particular the developer services reconciliation mechanism, which is an additional protection companies did not have at PR14. This will reconcile the difference between our forecast and outturn new connections, providing companies with additional revenue for any outturn new connection in excess of our forecast.

3.68 Overall, we do not consider it would be appropriate to adopt companies' forecast of new connections. For similar reasons, we also do not agree that we should have adopted Yorkshire Water's forecast of new connections in our growth cost allowance adjustment. The growth adjustment mitigates for the risk that our models may be overfunding companies with lower expected growth, and Yorkshire Water's area is expected to be a region with relatively low growth (which is also confirmed by the latest evidence from the Government on population growth).[67]

[67] See more detailed discussion on this in Ofwat, 'Reference of the PR19 final determinations: Cost efficiency - response to common issues in companies' statements of case', May 2020, chapter 4

3.69 Yorkshire Water argues that our decision to use our own forecasts for new connections, new mains and booster pumping stations has reduced its cost allowance by £14 million.[68]

3.70 While Yorkshire Water makes representations on the forecasts of some of our water cost drivers, it **does not dispute our forecasts of wastewater cost drivers, despite these drivers having similar forecast approaches**. For example, we forecast sewer length by placing 50% of weight on the company's forecast, as we do for length of water mains. However, Yorkshire Water does not make representations on the forecast of sewer length, nor on any wastewater cost driver, despite challenging our forecast of length of water mains.

3.71 We consider **this is clear evidence that companies' representations tend to focus on areas where they consider they deserve a higher allowance**, but do not reveal areas where our allowance might have favoured them. Our analysis shows that Yorkshire Water is benefitting from our independent forecasts in wastewater, by getting an allowance £17 million higher compared to a scenario where we used the company's forecast.

3.72 This fundamentally undermines the credibility of the company's claim on our forecasts of cost drivers in water and reinforces the need for independent views of cost drivers over the forecast period.

Key issue – Frontier shift

3.73 Yorkshire Water states that our frontier shift of 1.1% per year is too high.[69] Yorkshire Water raises six concerns with our frontier shift assessment which we reject as set out below. We note that Yorkshire Water appears to have changed the basis for its frontier shift estimate and is now referencing work from Oxera (rather than Economic Insight which it used in the PR19 process). Oxera references earlier work that it carried out on behalf of South East Water. It is unclear how this change has affected Yorkshire Water's cost proposals in its statement of case. We consider that there is a strong case for going beyond Yorkshire Water's productivity growth estimate of 0.75 to 0.8% per year. In particular: productivity growth in comparator sectors has been stronger than this in both the pre and post financial crisis periods; to take some account of value added measures which tend to be well above 1% per year; the additional impact of embodied technological change, which can increase productivity

[68] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 65, paragraph 198
[69] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 66, paragraphs 199-200,

growth estimates by 60%; and a one-off uplift to reflect the potential for additional efficiency improvement from the totex and outcomes framework.

3.74 **Our productivity estimate takes appropriate account of both pre and post financial crisis periods**. Yorkshire Water[70] and Oxera[71] (on behalf of Yorkshire Water) considers Europe Economics over-weights pre-financial crisis performance and disregards performance over the last 13 years, which introduces an upward bias in productivity estimates. Europe Economics considers both the more recent growth in the post crisis period, and also growth over a number of past full business cycles. In assessing total factor productivity growth Europe Economics considered productivity growth from EU KLEMS[72] for both the NACE[73] 1 dataset which covers 1970 to 2007 and the NACE 2 dataset which covers 1999 to 2014.[74]

3.75 Europe Economics did not include 2008 and 2009 when productivity growth was strongly negative. First, if the crisis period were to be included in these figures, then they would not genuinely be "pre-crisis" and "post-crisis" figures. More importantly, inclusion of these crisis years would make the figures severely downward biased, since the figures would then include a full economic contraction but only an incomplete part of the period of economic expansion either side of the crisis.[75]

3.76 The Europe Economics range takes into account both the pre and post crisis period as well as data from complete business cycles from the NACE 1 dataset. We note that Oxera's choice of time period for its estimates of 1996 to 2014 might not represent the entirety of complete business cycles.

[70] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 66, paragraph 199
[71] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 66, paragraph 199
[72] The EU KLEMS database provides data on measures of economic growth, productivity, employment, capital formation, and technological change at the industry level for all European Union member states, Japan, and the US. Productivity measures have been developed using growth accounting techniques.
[73] NACE is the acronym used to designate the various statistical classifications of economic activities developed since 1970 in the European Union. It provides the framework for collecting and presenting a large range of statistical data according to economic activity in the fields of economic statistics and in other statistical domains. Statistics produced on the basis of NACE are comparable at European and, in general, at world level. The use of NACE is mandatory within the European statistical system.
[74] Europe Economics, 'Real Price Effects and Frontier Shift – Final Assessment and Response to Company Representations', December 2019, p. 7, Table 3
[75] Europe Economics, 'Real Price Effects and Frontier Shift – Final Assessment and Response to Company Representations', December 2019, pp. 118-119

3.77 Overall, Europe Economics' forecasts of frontier shift are based on an appropriate time period as they consider both growth over more recent years and a number of past full business cycles. Performance in the post crisis period has been considered as the lower bound of Europe Economics' range (0.6%).[76] The upper bound of 1.2% is based on the stronger performing comparator sectors over both the pre and post crisis period and is for full business cycles.[77]

3.78 **It is appropriate to take into account embodied technological change.** Oxera on behalf of Yorkshire Water states that we should not consider embodied technological change due to risk of double counting and limited evidence of uplift.[78]

3.79 Disembodied technological change, as measured by total factor productivity, is the increase in output after taking account of increases in the quantity and quality of inputs. For example, it captures increases in output due to improved management processes.

3.80 Embodied technological change is the change in output from improvements in the quality of inputs (eg from technologically more advanced machines).

3.81 At a theoretical level, embodied technological change could represent frontier shift or catch-up efficiency. For example, the purchase of entirely new capital goods technology will represent a movement of the frontier rather than catch-up efficiency. The frontier shift analysis carried out by Europe Economics focused on competitive comparator sectors where we would not expect catch-up efficiency to be an issue, as inefficient firms will not survive in a competitive market (or if they can survive due to imperfections in competition, we would not expect the dispersion in efficiency levels to vary through time). Given that the reasoning in Europe Economics' report applies the percentage uplift for embodied technical change to total factor productivity estimates from competitive sectors, we would expect this uplift to represent frontier shift. Catch-up efficiency is dealt with below. We therefore reject Oxera's argument that embodied technological change equates to catch-up efficiency and that there is double counting.

[76] Europe Economics, 'Real Price Effects and Frontier Shift – Final Assessment and Response to Company Representations', December 2019, p. 79
[77] Europe Economics, 'Real Price Effects and Frontier Shift – Final Assessment and Response to Company Representations', December 2019, p. 79
[78] Yorkshire Water's Annex 09, Oxera, 'Issues with Ofwat's frontier shift assessment in PR19', March 2020, pp. 6-7

3.82 Europe Economics' recommendation to account for embodied technical change when selecting our frontier shift is based in part on evidence from peer reviewed academic research.[79] This research indicates that total factor productivity might need to be uplifted by as much as 60% to account for embodied technical change. While Europe Economics accepts that this research is limited, it notes it does 'not consider the fact that the articles [they] used by Uri and Hulten were published ten years apart represents a flaw in our approach. There is no reason why results from articles with different publication dates must necessarily be incompatible. Hence, in our view, this represents a wholly spurious criticism on the part of Oxera.' Europe Economics also notes it does not quantitatively apply an uplift for embodied technological change but simply states it should be accounted for by taking a value from towards the upper end of the range. Additionally, Oxera does not provide any alternative, better quantification of embodied technical shift.

3.83 Further details and response to Oxera's comments in relation to embodied technical change can be found in 'Europe Economics note responding to Oxera's arguments on embodied technical shift - 30 April'

3.84 **Our productivity estimates take account of the potential for catch-up efficiency.** Oxera (on behalf of Yorkshire Water) states that our frontier shift estimates do not incorporate a downward reduction in estimates of total productivity growth to reflect catch-up efficiency in historical estimates.[80] Our frontier shift range is based on productivity in competitive sectors only. This limits the effect of catch up on total factor productivity estimates. We do not consider that we need to adjust productivity estimates for competitive sectors for three reasons:

- In a reasonably competitive industry, inefficient firms will not survive in the long run, meaning that surviving firms may only have small efficiency differentials.
- Alternatively, in a reasonably competitive industry, even if efficiency levels of individual producers vary, on average, they might tend to cancel out across the sector and over time. For example if a firm makes a step forward in terms of frontier shift efficiency and other firms catch up over time, the average efficiency across the sector will reflect the frontier shift improvement that is made across the sector average efficiency across the sector will reflect the frontier shift improvement that is made across the sector.

[79] Europe Economics, 'Real Price Effects and Frontier Shift – Final Assessment and Response to Company Representations', December 2019, p. 7
[80] Yorkshire Water's Annex 09, Oxera, 'Issues with Ofwat's frontier shift assessment in PR19', March 2020, p. 7

- Even if there were variations in efficiency across companies there is no reason for expecting the degree of dispersion to change over time.

3.85 **We did not ignore data from the construction sector and Oxera's estimate significantly over weights this sector.** Oxera (on behalf of Yorkshire Water) states we ignored productivity data from the construction industry and suggested to use a composite measure which implicitly weights data from different industries to provide a single estimate frontier shift.[81] Europe Economics' frontier shift range of 0.6% to 1.2% is based on growth in comparator sectors and explicitly includes data from the construction sector. We do not consider that the share of totex that companies spend on construction necessarily makes it a closer comparator than other sectors which have a similar nature of activity to the water sector.[82]

3.86 In response to Oxera's suggestion to use a composite measure which implicitly weights data from different industries to provide a single estimate frontier shift, we consider a composite measure could lead to spurious accuracy and that it is better to consider productivity improvements of all comparator sectors in the round, as has been used by Europe Economics. This spurious accuracy is illustrated by Oxera's own estimates of productivity growth using this approach. Oxera's own composite measure of frontier shift significantly over-weights the construction sector, with construction accounting for around two thirds of the productivity growth for operating expenditure and half of capital expenditure. Since Oxera estimated a low total factor productivity growth rate for its time period of 0.2% per year for the construction sector, this over-weighting of construction significantly downward biases Oxera's estimates for frontier shift.[83]

3.87 **Our uplift from the totex and outcomes framework is appropriate.** Yorkshire Water states that we continued to apply an uplift from the totex and outcomes framework based on flawed evidence.[84] Our price control framework is designed to reward and encourage efficiency and innovation. At PR14, we introduced a totex and outcomes framework which has given companies the flexibility to decide how best to deliver their services, and to come up with the most cost-efficient and innovative solutions. In PR19, we expect that water

[81] Yorkshire Water's Annex 09, Oxera, 'Issues with Ofwat's frontier shift assessment in PR19', March 2020, p. 1
[82] Europe Economics, 'Real Price Effects and Frontier Shift – Final Assessment and Response to Company Representations', December 2019, p. 116
[83] South East Water, 'Wholesale efficiency assessment – PR19 Supporting Appendix 13', September 2018, p. 28, Table 4.9; and Europe Economics, 'Real Price Effects and Frontier Shift – Final Assessment and Response to Company Representations', December 2019, p. 117
[84] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 66, paragraph 200

companies, as well as the supply chain, will have better embedded the totex and outcomes frameworks in their business planning process.

3.88 In making our assessment of the potential for additional efficiency improvement from the totex and outcomes framework we drew on work from KPMG and Aqua consultants that forecast that there could be an additional 0.2% to 1.2% per year improvement in efficiency from the totex and outcomes framework over the next control period.[85] KPMG's range was based on three factors:

- **Outperformance:** KPMG examined outperformance from the totex and outcomes regime in the water and energy sectors and based on experience from the electricity distribution control (which is in its second totex control), made assumptions on the degree to which this was likely to continue in future controls.
- **Case studies:** 48 case studies provided by the water companies give examples of how they have been able to use the totex framework to realise greater efficiencies. These case studies varied across companies, and on their own, represented 3.8% of totex. KPMG found an average of 35.4% of efficiency savings, which by themselves translated to an overall efficiency improvement of 1.3% over 5 years.[86] These were drawn from a subset of over 180 examples provided by water companies and the supply chain.
- **Experience of other regulatory sectors:** KPMG reviewed performance improvements associated with structural or regulatory changes in 21 other settings, and found the upper bound of comparable performance gains to be 6.7% per year.

3.89 We reject the assertion that we have not provided sufficient evidence to justify an uplift from the totex and outcomes framework. We provided a significant body of evidence to support an uplift, including case studies put forward by the companies themselves together with evidence from both water and energy controls. Our uplift is small in comparison to upper quartile company outperformance of 2.4% per year. The case studies themselves suggest that there is substantial scope for all companies to learn best practice from their peers. KPMG's estimate was for the second control period for a totex and outcomes regime and therefore took into account that cost models were based on historical expenditure data. The alternative that Yorkshire Water appears to be suggesting is that no account should be taken of the totex and outcomes

[85] KPMG LLP and Aqua Consultants LTD, Report for Ofwat, 'Innovation and efficiency gains from the totex and outcomes framework', June 2018, p. 95, Table 31
[86] KPMG LLP and Aqua Consultants LTD, Report for Ofwat, 'Innovation and efficiency gains from the totex and outcomes framework', June 2018, p. 95, Table 31

regime going forwards. We do not consider that this is a credible position and does not reflect the balance of evidence.

3.90 **Frontier shift should be applied to all base expenditure.** Yorkshire Water states we incorrectly applied frontier shift to unmodelled costs including business rates, abstraction charges and traffic management act costs.[87] The frontier shift estimates identified for comparator sectors are based on productivity growth across all costs, including both base and enhancement costs. Given that the frontier shift estimate was based on all costs in comparator industries (including costs that might be regarded as 'fixed'), we therefore applied frontier shift to all wholesale base expenditure. Water unmodelled base expenditure includes business rates, Traffic Management Act costs and abstraction rates which in combination accounted for 7.9% (£3,653 million) of allowed totex.[88] We consider that there is some scope for companies to reduce these costs, in particular Traffic Management Act costs for example through the use of innovative or non-invasive ways to make repairs. If the frontier shift estimate was not being applied to these costs, then either comparable costs should have been removed from other sectors before productivity estimates are made; or the frontier shift on other costs should be increased as it is only being applied to a smaller proportion of costs in the water sector.

3.91 **Frontier shift should be applied to some enhancement expenditure.** Yorkshire Water states we incorrectly applied frontier shift to enhancement costs including WINEP which results in double counting.[89] In our final determinations,[90] we considered that we should apply frontier shift (and real price effects) to elements of enhancement costs which are more common across companies including the wastewater water industry national environment programme (WINEP) and metering costs. This is because the potential gains from productivity improvements are likely to be more significant for large, relatively homogenous programmes of work that are more common across companies. Other regulators have also applied frontier shift to enhancement costs.[91]

[87] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 67 paragraph 201.
[88] In our 'Reference of the PR19 final determinations: Cross-cutting issues' submission to the CMA we erroneously stated this was £40m over the price control period rather than £40m per year. Across the 2020-25 period and net of real price effects allowances this is equivalent to £96 million, or 0.2% of totex.
[89] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 67, paragraph 201
[90] Ofwat, 'PR19 final determinations: Securing cost efficiency technical appendix', December 2019, p. 116
[91] Ofwat, 'Reference of the PR19 final determinations: Cost efficiency - response to common issues in companies' statements of case', May 2020, Chapter 7, Table 7.5

3.92 We accept that enhancement costs are based on company estimates of future costs. Therefore to the extent that enhancement costs are included in future efficiency improvements due to frontier shift then there could be scope for double counting. As noted in our final determinations and 'Reference of the PR19 final determinations: Cross-cutting issues', we reviewed company forecasts of frontier shift on enhancement costs. In general, we found that frontier shift assumptions on enhancement expenditure tended to be limited and were often offset by real price effect adjustments (where these are explicit). We therefore considered there was a case to apply frontier shift (and real price effect) adjustments to specific areas of enhancement costs - to WINEP and metering costs where costs were more common and/or are part of large programmes of work.

3.93 The WINEP efficient cost benchmark is defined by the third and fourth companies (United Utilities and Dŵr Cymru).[92] It is therefore frontier shift and real price effect adjustments on these companies that are most relevant when considering whether there has been double counting. As we set out below there is no evidence that the upper quartile companies applied a net frontier shift challenge to WINEP enhancement expenditure, ie. a frontier shift estimate that is greater than the corresponding real price effect adjustment. We therefore consider our application of frontier shift does not double count efficiency gains.

3.94 We provide a more detailed response to these issues in 'Cost efficiency – common issues chapter 7'.[93]

Key issue – Input price - real price effects

3.95 **A real price adjustment for energy prices is not appropriate**. Yorkshire Water states we failed to account for all real price effects and that we should have allowed for a real price effect for energy.[94] We consider that we adequately assessed the potential need for an energy real price effect allowance and there is insufficient evidence to make such an allowance. We outlined the key reasons we did not include a real price effect allowance for energy in our final determination[95] and do so again in 'Cost efficiency – common issues' chapter 8.[96] We continue to consider a real price adjustment for energy is not

[92] Ofwat, Feeder model: Enhancement aggregator, December 2019, WINEP in-the-round tab.
[93] Ofwat, 'Reference of the PR19 final determinations: Cost efficiency - response to common issues in companies' statements of case', May 2020, Chapter 7
[94] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 67, paragraph 202
[95] 'PR19 final determinations: Securing cost efficiency technical appendix', pp. 196-198.
[96] Ofwat, 'Reference of the PR19 final determinations: Cost efficiency - response to common issues in companies' statements of case', May 2020, Chapter 8

appropriate as it would weaken company incentives to minimise energy costs. In addition we continue to consider that there is a lack of consistent evidence of a wedge between energy costs and CPIH measured inflation; significant uncertainty about forecasts of energy prices; no clear theoretical link between energy costs and productivity growth; energy costs are partially within management control; some water companies do not assume a real price effect adjustment or assume that any adjustment would be very small; companies are introducing a number of energy efficiency measures in their move towards net zero carbon emissions; and energy costs are partially captured by CPIH.

3.96 We note that uncertainty over energy prices has increased with Covid-19, with recent falls in oil prices putting significant downward pressure on energy prices. While the expected impacts for the 2020-25 period are still unclear, this may result in falling real energy costs over the period and further reduce the case for a positive real price adjustment for energy.

3.97 **A real price adjustment for chemicals is not appropriate.** Yorkshire Water states that we should have allowed for a real price effects allowance for chemicals.[97] In our final determination we stated that there was insufficient evidence for a real price effect adjustment for chemical costs.[98] Based on advice from Europe Economics there was no historical statistical significant wedge and wide variation in company forecasts and lack of robust independent forecasts.[99] In the PR19 process Yorkshire Water stated that the Office of National Statistics producer price inflation index used to assess chemical costs covered a wider range of chemicals than the ones actually used by companies and hence it may not be the most accurate index to use. At the time we stated that other water companies had used the same index ("Chemicals and Chemical Products" producer price index) and Yorkshire Water did not suggest an alternative. We also highlighted that another independent third party forecast on chemicals, the World Bank commodities price forecast implied negative wedges ranging from 1.1% to 2.7% for the chemicals sector globally. However, as these were global estimates by the World Bank and only available for a few specific types of chemicals, we placed less weight on these forecasts than the historical wedge analysis. Yorkshire Water does not provide specific evidence in support of a real price effect allowance for chemicals in its statement of case.

[97] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 67, paragraph 202
[98] Ofwat, 'PR19 final determinations: Securing cost efficiency technical appendix', December 2019, pp. 199-200
[99] Ofwat, 'PR19 final determinations: Securing cost efficiency technical appendix', December 2019, p. 192

3.98 **A real price adjustment for materials, plant and equipment is not appropriate**. Yorkshire Water states that we should have allowed for a real price effect for materials, plant and equipment prices. In our final determinations,[100] we stated that there was insufficient evidence that a real price effects allowance for materials, plant and equipment was required. While there was mixed evidence across the relevant indices for materials, plant and equipment input costs,[101] half of the indices indicated a lack of a material wedge in water company forecasts. Additionally, some companies had proposed a zero or negative real price effect for this cost component, suggesting companies can limit input prices in this area to no more or less than CPIH. We continue to consider that a real price effect adjustment is not required for material, plant and equipment costs.

3.99 We provide a more detailed response to this issue in chapter 8 of 'Cost efficiency – common issues', chapter 8.[102]

Key issue - Flooding investment in Hull and Haltemprice

3.100 In its statement of case Yorkshire Water claims that our final determination approach to funding its proposal to invest to reduce flooding risk in Hull and Haltemprice was stifling innovation being deployed to enhance resilience.[103]

3.101 In our final determination out of the requested £28.6 million for the innovative partnership approach to address greater risk of flooding in the Hull area, we made an efficient additional allowance of £16.4 million on top of our modelled allowance for reducing sewer flooding improvement.

3.102 At draft determination we did not adjust our base allowance because Yorkshire Water provided little evidence as to the scope and schemes that would be delivered for customers benefit with the money it requested.

3.103 In response to our draft determination Yorkshire Water, rather than set out any detail of the schemes it proposes to deliver, described how the natural topography of the area inhibits natural drainage and increases the risk of

[100] Ofwat, 'PR19 final determinations: Securing cost efficiency technical appendix', December 2019, p. 200
[101] Europe Economics, 'Real Price Effects and Frontier Shift – Final Assessment and Response to Company Representations', December 2019, p. 45
[102] Ofwat, 'Reference of the PR19 final determinations: Cost efficiency - response to common issues in companies' statements of case', May 2020, Chapter 8
[103] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 90-91, paragraphs 307-319

flooding.[104] We are very supportive of innovative partnership approaches to promote new ways of multi-agency collaboration to tackle such local challenges, but need evidence of where any additional funding on top of a modelled base allowance will be efficiently invested.

3.104 However, Yorkshire Water did not provide compelling evidence to justify the scope and cost build-up that came to the requested £28.6 million total. In none of its business plan documents[105] nor in its response to the draft determination did it itemise what customers can expect to receive as a result of this proposed capital investment. We were therefore unable to assess the scope and costs through any bottom up approach.

3.105 In such cases of a lack of evidence we would normally reject the claim outright and make no additional allowance. However, since we are supportive of innovation and partnership working and understand the drainage constraints in Hull we made an allowance in our final determination. The lack of detailed evidence left us with no alternative to making a top down calculated allowance in addition to the implicit allowance for flood risk reduction in Hull that was within our base modelled allowance. To calculate our additional allowance we estimated the implicit allowance for reducing sewer flooding risk in the Hull area and multiplied it by the increased risk, deducting from the total calculated the implicit allowance, which was already included in our base models. This means that our total allowance for Hull is £20.5 million as there is another £4.1 million of implicit allowance which we calculated based on the proportion of the company's total length of sewer that is in Hull and Haltemprice.

3.106 We expected Yorkshire Water to use our £20.5 million total allowance to develop a long-term plan for Hull area, and implement solutions to significantly reduce flooding risk to properties in the area. We also expected the company to use its wider base allowance to reduce internal sewer flooding within its operating region by 47% and therefore meet our stretching performance commitment. If the company delivers a more stretching sewer flooding performance, it will be able to earn outperformance payments under the outcome delivery incentive framework.

3.107 We consider that our total allowance of more than 70% of that requested by Yorkshire Water, in the face of no detail of schemes to be delivered is relatively generous and would in no way stifle innovation or appropriate investment in Hull and Haltemprice.

[104] Yorkshire Water, Exhibit 033 – YWS DD Representation Cost Efficiency, pp. 85-90
[105] Yorkshire Water, Exhibit 01, YWS PR19 Business plan page 145, Exhibits 066-097 and 066- 098

Enhancement costs

3.108 Our business plan tables include different categories of enhancement investment. We assessed the costs of some of these categories using benchmarking analysis across the industry. For enhancement categories that were not suitable for benchmarking analysis, we made an allowance based on the quality of the evidence companies put forward in their business plans.

3.109 In such cases our evidence assessment followed a similar process as that for cost adjustment claims, which we published in our price review methodology.[106] For enhancement proposals in particular we assessed evidence for the need to invest, whether the best option was adopted to address the need, and the robustness of the cost estimate. We also ensured customers were protected against non-delivery of the investment, usually through the ODI framework.

3.110 We accepted the need for a number of proposals, but where we found insufficient evidence that the company had undertaken a full options appraisal before putting forward the solution in its business plan, we challenged the proposed costs. We often see evidence of significant cost savings achieved through delivering an alternative solution to that first proposed,[107] and so in order to protect customers we applied a cost challenge. If a company provided evidence that a lower cost option was available but gave no reasons as to why it was rejected, we use the lower cost option as our allowance. Where a company does not provide evidence that the selected option is optimal, we protect customers from a potentially sub-optimal solution by applying a standard 20% challenge to proposed costs. We applied such challenges to some of Yorkshire Water's proposals.

3.111 Throughout the process we were very transparent about our assessment of companies' proposal. Yorkshire Water had three opportunities to provide the appropriate evidence to us. We expect the water companies to carefully consider their options, just as a competitive company would, so that customers do not pay for an inefficient investment.

[106] Ofwat, 'Delivering Water 2020: Our final methodology for the 2019 price review; Appendix 11: Securing cost efficiency', December 2017, pp. 14-15, Box 2
[107] For example a recent Anglian Water project where the built solution was less than 50% of the cost of the solution previously considered.

Key issue - Enhancement model benchmarks

3.112 In its statement of case,[108] Yorkshire Water argues that using an upper quartile efficiency challenge to derive our enhancement allowances is not appropriate because the models are relatively simple, are based on forecast data with limited observations and may not include all explanatory drivers.

3.113 We explained in our draft determination documentation[109] our different approaches to setting efficient costs for base and enhancement. There we explain that it is more difficult to estimate enhancement costs than base costs due to their irregular nature. We explain that for enhancement allowances we were focusing less on incentives for submitting efficient costs and more on protecting customers from paying for inefficient costs. There is a greater risk that companies overstate their enhancement costs, as we do not have robust historical benchmarks and so we are more dependent on company forecast information. As a result we typically set the allowance to be the minimum of our view of efficient costs and the company's view of efficient costs. For some aspects of work we made this 'minimum of' allowance at a programme level, so that apparent efficiencies in one cost area within a programme could offset inefficiencies in other areas of the same programme. We took this programme wide approach to the large wastewater environmental programme (WINEP) costs due to potential differences in cost allocation between different cost drivers within the programme.

3.114 We considered using reported actual costs to derive our enhancement models, for example outturn phosphorus removal costs, but we concluded that due to the tightening of phosphorus standards, future costs may be different to past costs. For this reason we used forecast costs, and no response to our draft determination suggested we should have done otherwise.

3.115 We also tried a number of modelling approaches for each area to seek for appropriate statistical relationships, using engineering and economic rationale in choosing an appropriate model, as well as statistical fit diagnostics to decide on the best model to use. Where a number of models were appropriate we used a triangulation of the answers each of the possible models gave. In areas with poor models we rejected the modelled approach and instead considered the detailed evidence each company provided in support of its enhancement proposals.

[108] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 62-63, paragraphs 195-196
[109] Ofwat, 'PR19 draft determinations: Securing cost efficiency technical appendix', July 2019, pp. 35-37, Section 4.1

3.116 We considered it appropriate to use the upper quartile level of costs for our benchmark. We consider this a reasonable approach to setting efficient allowances for enhancement where the extent of cost information provided is limited. We did not tighten our enhancement challenge to that of the third wastewater company or fourth water company as we did in our econometric models in recognition of the limitation of the data sets we were using in enhancement cost assessment.

3.117 It should be noted that we used an upper quartile approach to making cost allowances, including enhancement allowances, in our 2014 price review with simpler enhancement models and our total cost models. An approach to setting cost allowances on a basis that requires a greater level of efficiency than industry average basis was upheld by the CMA in its 2015 Bristol Water final determination. The CMA cites regulatory examples from other sectors on use of the upper quartile.[110]

3.118 We discuss below the specific issues Yorkshire Water has raised with our approach to setting an efficient environmental programme allowance and in particular its critique of our phosphorus removal model.

Key issue - Water industry national environment programme (WINEP)

3.119 Yorkshire Water considers that our phosphorus removal cost model does not give an appropriate allowance for the programme of improvements proposed because it does not take adequate account of all relevant cost drivers.[111] The company claims that a consequence of this is that it will be forced to follow a less environmentally friendly strategy relying on the use of chemicals.[112]

3.120 We recognise that the discussion in this section about the intricacies of Yorkshire Water's environmental programme is technical and complex, requiring a detailed knowledge of wastewater treatment and environmental regulations. We are able to provide more information if this is required.

3.121 Ahead of each price review the Environment Agency draws up a list of actions it expects each of the water companies operating in England to deliver in the 5 year period covered by the review in order to comply with environmental

[110] CMA, Bristol Water, A reference under section 12(3)(a) of the Water Industry Act 1991, Report, paragraphs 4.205 – 4.225
[111] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp 64-65, paragraph 197(c)
[112] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp 88-89, paragraphs 300-306

legislation and government policy. This list is termed the Water Industry National Environment Programme (or WINEP) for PR19. Actions include environmental improvement projects, investigations or monitoring.

3.122 Yorkshire Water included all the actions listed in WINEP in its business plan for 2020-25. In terms of the investment required, Yorkshire Water's environmental programme for 2020-25 is the largest of any water company. The programme is dominated by requirements to reduce the amount of phosphorus in sewage treatment works discharges. As a proportion of its overall wastewater WINEP costs, at 73% Yorkshire Water's phosphorus removal programme is the largest of any water company.

3.123 **Our cost allowance provided Yorkshire Water with the efficient costs of meeting the Environment Agency's requirements for first time or additional phosphorus removal** in the 2020-25 period as specified in the March 2019 release of WINEP. This programme comprised schemes at 82 sewage treatment works (STWs) as follows:

- 10 STWs with where the requirement is driven by the Urban Waste Water Treatment Directive 91/271/EC (UWWTD),
- 32 STWs where the driver is to meet improved river water quality under the Water Framework Directive 2000/60/EC (WFD) and
- 40 STWs where both UWWTD and WFD apply.

3.124 At 77 of the STWs a first time phosphorus consent limit is being imposed, while an existing phosphorus consent limit is being tightened at all but one of the remaining five sites. At the other (Skipton STW), no investment is required as the existing WFD consent is tighter than the new UWWTD driven requirement.

3.125 However, the most recent release of WINEP (dated March 2020) requires Yorkshire Water to deliver a significantly smaller phosphorus removal programme in 2020-25 than we assumed in our final determination.[113] The revised programme comprises schemes at 56 sites as follows:

- no STWs where the driver is the UWWTD,
- 25 STWs where the driver is the WFD, and
- 31 STWs where both drivers apply.

[113] Environment Agency, 'Environment Agency - WINEP3 March 2020 National Full Data Set Public Version', March 2020

3.126 The difference is accounted for by the Environment Agency having shifted the required completion dates for schemes at 26 STWs from AMP7 into AMP8 (either 22 December 2027 for 'WFD only'-driven schemes or 12 May 2026 for the remaining schemes). We understand it made these changes having agreed in August 2019[114] to the company's proposals for re-phasing its phosphorus removal programme over a longer period (set out in a Yorkshire Water paper dated 14 May 2019[115]). The Environment Agency then opted not to revert to the original deadlines once the company had decided not to re-phase its programme after all.

3.127 Had the most recent version of WINEP been available at the time of the final determination our allowance for Yorkshire Water's phosphorus removal programme may well have been correspondingly reduced. That said, the allowance would need to have taken some account of the deferred schemes. A number of the deferred schemes are at some of Yorkshire Water's largest STWs and we accept that some capital expenditure would be needed on these in the 2020-25 period to enable the May 2026 deadline to be met.

3.128 In determining this aspect we consider that the CMA has two options:

- Option 1 - It can effectively ignore the re-phasing of Yorkshire Water's phosphorus removal programme incorporated in the latest release of WINEP on the basis that Yorkshire Water was already aware that it had the EA's consent to spread its programme across AMP7 and into AMP8 and yet had made the choice, which it was entitled to do, not to do so; or
- Option 2 - It could decide it was in customers' best interests to take advantage of the flexibility offered by the deferred scheme completion dates in the latest version of WINEP and re-determine Yorkshire Water's cost allowance on the basis that the company only needs to deliver a proportion of its phosphorus removal programme by 31 March 2025.

3.129 We set out the relative advantages and drawbacks of these two options in table 3.3 below.

[114] Ofwat, Y001 Environment Agency letter PR19: Yorkshire Water WINEP3 (Phosphorus Removal) Amber Obligations re-phasing proposal for AMP7, August 2019
[115] Ofwat, Y002 Yorkshire Water WINEP3 (Phosphorus Removal) Amber Obligations Re-phasing Proposal for AMP7, May 2019.

Table 3.3 Advantages and drawbacks of options of making a cost allowance for phased phosphorus removal programme in redetermination.

	Option 1	Option 2
Advantages	• Delivers environmental benefits earlier • Simpler to administer in that it involves no change to current company plans	• Reduces customer bills in 2020-25, easing affordability pressures • Eases pressures on supply chain, again potentially reducing costs • Allows time for company to investigate and develop alternative, more cost effective and sustainable solutions • Allows time for company to develop partnership approaches • Would provide some 'slack' to mitigate against the disruption to the timetable and impact on costs caused by Covid-19, the full extent of which will not be known for some time.
Drawbacks	• Ignores impact of Covid-19 • Potentially stifles innovation and catchment approaches, thereby inhibiting long-term, sustainable investment in natural resilience	• May be seen as overriding the strategic decisions properly taken by the company's management • Adds complexity to the re-determination

3.130 Phosphorus is a nutrient which can cause eutrophication in freshwaters if present in sufficient concentrations. The UWWTD describes eutrophication as 'the enrichment of water by nutrients, especially compounds of nitrogen and/or phosphorus, causing an accelerated growth of algae and higher forms of plant life to produce an undesirable disturbance to the balance of organisms present in the water and to the quality of the water concerned'. To meet the requirements of environmental legislation, phosphorus removal has been carried out at a growing number of the STWs in England and Wales since the mid-1990s. The Environment Agency reports that measures taken at around 650 STWs in England have reduced the quantity of phosphorus being discharged to rivers from 21.4 kilotonnes in 1995 to 8.6 kilotonnes in 2015.[116] A large majority of this improvement has been achieved by chemical removal which the Environment Agency describes as the 'norm' in the UK. In fact, only around 20 of the 650 STWs rely on biological phosphorus removal. The

[116] Environment Agency, Phosphorus and Freshwater Eutrophication Pressure Narrative, October 2019, pp17, 35, 39, Section 2.2, Annex 3, Annex 6

Environment Agency considers the take up of biological phosphorus removal in the UK has been prevented by perceptions around cost, but also reliability, energy and carbon. A 2013 report by Atkins[117] notes that while an industry workshop identified chemical dosing as 'currently the most cost effective solution', some companies had had (unspecified) negative experiences with biological phosphorus removal.

3.131 This evidence contrasts with Yorkshire Water's enthusiasm for biological phosphorus removal, its proposed deployment at some larger STWs and its claimed advantages relative to chemical removal. Yorkshire Water's environmental concerns appear to us to be overstated. While we acknowledge that the phosphorus removal chemical, usually iron (II) sulphate, can be dangerous to aquatic health, the risk of it being discharged in the treated effluent can be managed, and such management is reinforced within the discharge permit which limits the concentration of iron in the treated effluent for example. The Environment Agency is clearly aware of the risk and is ensuring such protection. All but one of Yorkshire Water's 56 STWs at which first time or additional phosphorus removal is required in 2020-25 has a proposed iron limit set out in the latest version of WINEP.

3.132 We also acknowledge the increase in tanker movements that would result from chemical dosing but consider this should be viewed in the context of the overall level of chemical phosphorus removal carried out in the country. Yorkshire Water's April 2019 revised business plan proposes biological phosphorus removal at seven STWs. As indicated above, there are approximately 630 STWs in England where chemical phosphorus removal was being undertaken in 2015. Accordingly, if Yorkshire Water installed chemical dosing at these seven sites then the number of STWs receiving tanker deliveries of chemicals will increase, by 2027, by little more than 1%. Once all the STWs provided with chemical phosphorus removal before 2019-20 are taken into account, the increase becomes much less than 1%. The percentage becomes smaller still if water treatment works are also taken into account, particularly since iron (II) sulphate is widely used in the clarification process in drinking water production.

3.133 It is also pertinent to note, as Yorkshire Water acknowledges,[118] that biological phosphorus removal does not completely eliminate the need for chemical dosing or, consequently, storage tanks or tanker deliveries. Dosing

[117] Ofwat, Confidential report, Atkins – PR14 Investigations and trials to determine the feasibility of treating phosphorus at sewage treatment works down to or approaching 0.1mg/l within the UK – Trials Programme Final Report, provided as N002, June 2013, p3, Table 2 C
[118] Yorkshire Water Exhibit 066-049, PR19 Business Plan, Appendix 8g PR19 WINEP Technical Appendix, pp. 156-159, Sections 8.4 & 8.8

facilities are still required upstream of the tertiary solids removal process to polish effluents when the biological process is working sub-optimally, in cold or otherwise abnormal conditions or when the consent is low.

3.134 Yorkshire Water contends that the £113 million cost gap between the totex requested for its phosphorus removal programme in its revised business plan and our final determination allowance is not a measure of inefficiency.[119] Rather Yorkshire Water consider it is due to deficiencies in our cost models, notably their failure to take account of factors that cause Yorkshire Water's efficient costs to be higher than other companies. In particular Yorkshire Water notes that it is significantly more affected by the UWWTD than other companies and that the requirement of this Directive for on-site treatment precludes it from adopting potentially less costly alternative approaches such as catchment management that are open to other companies. As a result, its efficient costs may appear higher than the industry average. Yorkshire Water acknowledges that following its representations[120] on the draft determination we took some account of the impact of the UWWTD in a new cost model which predicted higher efficient costs for Yorkshire Water but then triangulated this with the results of the other two models used in the draft determination. Yorkshire Water argues that the result of this triangulation (or averaging) was that the positive adjustment to Yorkshire Water's allowance was not as great as it could or should have been because it was diluted and that our approach still did not adequately estimate Yorkshire Water's efficient level of spend on phosphorus removals.

3.135 **Yorkshire Water is not correct in saying that our new model took into account the impact of the UWWTD**. Our further analysis, prompted by Yorkshire Water's representation on the draft determination, investigated the impact of the legislative driver on phosphorus removal costs but found no evidence to support the company's contention that the UWWTD drives higher efficient phosphorus removal costs than other legislative drivers. This is not surprising since Water Framework Directive consent levels are usually significantly lower than the 1mg/l or 2mg/l annual average limits required by the UWWTD. Consequently, it may require more substantive and complex treatment interventions to meet them, at greater cost. In Yorkshire Water's WINEP the average consent limit at the 68 STWs where the limit is driven by the Water Framework Directive is 0.66mg/l while the average limit at the 12 STWs where the UWWTD is the driver is 1.92mg/l. Also, opportunities to implement cheaper, reliable solutions that do not rely on on-site treatment may not always exist. In

[119] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 38, paragraph 120(a)
[120] Yorkshire Water Exhibit 068-004-04 Cost Efficiency : Yorkshire Water Draft Determination Representation, pp. 23-28, Section 4

Yorkshire Water's WINEP the average consent limit at the 68 STWs where the limit is driven by the Water Framework Directive is 0.66mg/l while the average limit at the 12 STWs where the UWWTD is the driver is 1.92mg/l. Also, opportunities to implement cheaper, reliable solutions that do not rely on on-site treatment may not always exist.

3.136 However, our post draft determination analysis instead demonstrated that companies with a higher proportion of schemes with a Water Framework Directive 'No deterioration' driver may appear more efficient ie. lower cost. Since Yorkshire Water's phosphorus removal programme was unusual in containing no Water Framework Directive 'No deterioration' driven schemes, our final determination allowance for Yorkshire Water took account of this by triangulating the results of the three models. The effect of this was to reduce the cost gap by £16 million (pre-efficiency) or £14.5 million after applying the catch-up and frontier shift challenges.

3.137 Our rationale for taking account of the legislative driver was that as consent limits which are driven by the Water Framework Directive 'No deterioration' requirement average 2.5mg/l across the industry, very little, perhaps even no expenditure might be required to comply with the new consent. However, we have now reconsidered this issue. Specifically, we have looked for evidence that Water Framework Directive 'No deterioration' schemes are more likely to involve low or no cost solutions and have found none, thus casting significant doubt on the premise for the perceived need for the third model.

3.138 As mentioned above, the Water Framework Directive 'No deterioration' driver tends to have less stringent consent limits associated with it. In deriving a third cost model which reflects the finding that companies with more Water Framework Directive 'No deterioration' schemes tend to have lower costs, we may simply be acknowledging the fact that tighter consents drive higher costs. As one of our two models (in which the number of sites with a consent <=0.5mg/l is a variable) already controls for this fact, it would seem to further weaken the justification for introducing the third model.

3.139 We consider that the increase in our allowance for phosphorus removal between draft and final determinations was a **favourable increase for Yorkshire Water.** We consider that the remaining cost gap is a measure of Yorkshire Water's inefficiency.

Other issues raised by Yorkshire Water

3.140 Table 3.4 below sets out other issues raised by Yorkshire Water in its submission in relation to costs and our response to each of those points.

Table 3.4: Other issues on costs raised by Yorkshire Water in its statement of case

Key point in Yorkshire Water's submission	Summary of our response
Resilience Enhancement In paragraph 45 of its statement of case, Yorkshire Water suggests that during a teach-in to the CMA we had stated that furthering the resilience objective was discretionary and this was wrong.	We agree that furthering the resilience objective is not discretionary. However, proposals to invest to enhance resilience according to the definition of resilience enhancement in the business plan tables, are discretionary We explain further in paragraphs 3.135-3.158 below.
Paragraph 120 (e) – **Traffic Management Act costs** In Yorkshire Water's view costs to meet Traffic Management obligations were not adequately covered in our final determination and gave rise to a £21.6 million gap.	We considered that it was appropriate to apply a 50% reduction to proposed Traffic Management Act costs. We considered that the majority of the implementation costs were already included in our base allowance and that the evidence provided was not sufficiently convincing to justify that customers should pay for a large increase in expected costs. See paragraphs 3.145 to 3.150 for more detail.
Paragraph 120(f) - **Drinking water quality** Yorkshire Water states that cost challenges have been applied to other enhancement costs not related to WINEP. The main impact of this was a reduction in the drinking water quality programme where £15 million (c.20%) of costs were removed.	We identified insufficient optioneering and breakdown of scheme costs to justify the efficient allocation of base and enhancement costs and applied appropriate cost challenges to set an efficient allowance that protected customers for paying more than they should. See paragraphs 3.151 to 3.156 for more detail.

Resilience enhancement investment proposals

3.141 In its statement of case,[121] Yorkshire Water seeks to imply that during a teach-in to the CMA we suggested that furthering the resilience objective was discretionary. This is a blatant mischaracterisation of our position.

3.142 Furthering the resilience objective is a primary duty which we considered carefully when making our final determination decisions.

3.143 However, companies' investment proposals in their business plan are generally subject to company discretion. An exception would be investment proposals to deliver environmental obligations set out in the water industry national environment programme (WINEP). There are also investment whose need is not discretionary, but the type of solution is, such as investments to meet drinking water quality standards or to address drought resilience (where the need is identified in the water resources management plan). In the teach-in we specifically referred to the discretionary nature of investment proposals aimed to mitigate other low probability and high consequence events. This specific category of resilience investment has no statutory driver and both the need to invest and the type of solution is at company discretion.

3.144 Yorkshire Water, in its water services, made no investment proposals to mitigate low probability, high consequence events. However, it proposed to enhance resilience to sewer flooding and targeted maintenance programmes to maximise resilience benefits. We made efficient cost allowances for these proposals, thus furthering the resilience objective.

Traffic Management Act costs

3.145 The Traffic Management Act 2004 (TMA) places a duty on local authorities to make sure traffic moves freely and quickly on their roads and the roads of nearby authorities. Water companies who want to carry out street works must apply to the highway authority for a permit. Companies incur costs relating to the permits themselves as well as the administration of the permit schemes.

3.146 Given that these costs are incurred only by a subset of companies and are not well correlated with the cost drivers in our econometric models, we decided to exclude these costs from our models.

3.147 Yorkshire Water highlights[122] the £21.6 million gap between its final business plan and final determinations relating to Traffic Management Act costs. It states

[121] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp.15-16, paragraph 45
[122] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 36, paragraph 120 (e)

that significant elements of the costs are determined by local councils, and not by Yorkshire Water. In Yorkshire Water's view these costs are not adequately covered in the modelled allowance.

3.148 Yorkshire Water provided additional information in its representations on the draft determinations. After considering the additional evidence we retained our allowance as at draft determinations. We considered that it was appropriate to apply the 50% reduction to proposed Traffic Management Act costs for the following reasons:

3.149 Yorkshire Water's high Traffic Management Act forecast is mainly due to the inclusion of implementation costs and covered costs such as manned traffic lights and out-of-hours working. We considered that the majority of these costs were already included in our base allowance as these costs would be incurred for roadworks whether there was a permit scheme in place or not. We also did not consider that these implementation costs could be assumed for all roadworks.

3.150 The company's forecast costs were significantly higher than its historical and current costs. The evidence provided was not sufficiently convincing to justify that customers should pay for a large increase in expected costs. The company has sufficient protection through the cost sharing mechanism and the five-yearly re-set of the price control in the event of all highways authorities introducing further 'all street' permits. We note that even after our challenge, our Traffic Management Act allowance for Yorkshire Water is second highest in the sector, and significantly higher than other comparable companies.

Drinking water quality

3.151 In its statement of case[123] Yorkshire Water claims that we applied an inappropriate cost challenge to other enhancement costs, and it singles out its proposals to invest to meet drinking water quality standards. It proposed costs of £61.4 million to address deteriorating raw water quality, and £17.0 million for improving the taste odour and colour of drinking water. These are significant proposals for which we would expect a detailed explanation of the investment options the company considered, how it chose the investment that it did and a breakdown of its costs to demonstrate their efficiency and appropriate allocation between base and enhancement.

[123] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 39, paragraph 120 (f)

3.152 In its business plan we could not find details for all the schemes of options the company had considered nor a breakdown of the costs and in particular how costs had been allocated between base and enhancement. We challenged Yorkshire Water at the draft determination[124] [125] to provide further detailed information on the capital costs it was proposing. We challenged Northumbrian Water in a similar way on its expenditure to address deteriorating raw water quality at the draft determination. Northumbrian Water provided additional evidence in its representation which convinced us and we removed the draft determination challenge to costs for the final determination.[126] We received no further information from Yorkshire Water in its representations to the draft determination meaning we were not able to increase our allowance for the final determination.

3.153 For proposals to address deteriorating raw water quality we identified insufficient evidence of the options the company considered, and no breakdown of scheme costs to justify the efficient allocation between base and enhancement costs for three of the five schemes. We applied a standard 20% cost challenge to three of the five schemes to protect customers from poor optioneering resulting in an inefficient and costly capital solution being implemented.

3.154 For proposals to improve the taste, colour and odour of water, we identified insufficient evidence to justify the division between base and enhancement costs. We applied a standard 20% cost challenge to set an efficient allowance for enhancement capital costs.

3.155 We also did not make an enhancement allowance for the associated operating costs for these drinking water quality schemes because our approach of using company forecasts of treatment works complexity in our base models means we allowed for this additional opex in our base allowance at the final determination.

3.156 In our final determination we made enhancement allowances of £12.8 million for improving taste odour and colour of water, and £50.6 million for accommodating deteriorating raw water quality.

[124] Ofwat, 'PR19 final determinations: Securing cost efficiency technical appendix', July 2019, July 2019, section 4.8.1, pp. 72-74
[125] Ofwat, Draft determination Wholesale water raw water deterioration model, July 2019, 'Deep dive_YKY' tab
[126] Ofwat, Draft determination Wholesale water raw water deterioration model, July 2019, 'Deep dive_NES' tab

Conclusion

3.157 Yorkshire Water's business plan costs for the period 2020-25 were considerably higher than its historical costs. In coming to our view of efficient cost allowances for Yorkshire Water, we used comparative information and benchmarking wherever possible. This mitigates against the asymmetry of information and the risk of being subject to one-sided arguments from the company.

3.158 Overall, we do not find any additional credible and convincing evidence in the company's statement of case that demonstrates that Yorkshire Water's efficient cost allowance was understated.

3.159 Comparative information shows the company is inefficient on base costs. While the company argues that our base allowance is understated, it provides two counterintuitive leakage models in support of its statement. In fact, our alternative modelling specifications suggest that our base allowance may have favoured the company. The company also makes selective representations on our forecasts of cost drivers, but does not dispute those drivers where our independent forecasts benefit the company.

3.160 On enhancement costs, the majority of the disallowance relates to the company's wastewater WINEP, where we allowed the efficient cost. In those areas where we could not make use of benchmarking, the company's proposed expenditure was poorly evidenced and we did not allow the full amount requested.

3.161 We made generous allowances to the company in residential retail, wholesale water base costs, and a number of areas of enhancement expenditure (metering, raw water deterioration, water WINEP). We provided the company with an additional allowance for its proposed work in Hull and Haltemprice, despite the limited evidence of the detailed scope of its proposed work.

3.162 We are satisfied that we followed all necessary steps to ensure the company's cost allowance in our final determination was efficient and appropriate. We suggest that the CMA approaches the cost allowances for Yorkshire Water in the round and considers how our final determination weighed up the company's arguments as part of a broader final determination package.

4. Delivering outcomes for customers

Summary

4.1 At the final determination, we set an outcomes package for Yorkshire Water which included 43 performance commitments; 15 of these performance commitments were common to all water and sewerage companies. Financial outcome delivery incentives (ODIs) applied to 28 performance commitments.

4.2 The company is currently performing poorly on water quality contacts and is a lower quartile performer in terms of its comparative leakage levels when normalised by mains length and on a per property basis. In 2012-13 the company recorded its lowest level of leakage. Since then, its levels of leakage have increased 9.5%. The company is also currently performing poorly at a sector level on key wastewater metrics such as internal sewer flooding, sewer collapses and pollution incidents. Despite poor performance, the company is anticipated to earn notable outperformance payments for internal sewer flooding and pollution incidents.[127] The company has an average service incentive mechanism score for customer service. Its performance on asset health, in particular the four common asset heath performance commitments is poor.

4.3 In its September 2018 business plan, and its revised plan in April 2019, the company proposed stretching levels on some water performance commitments, but was less stretching on some wastewater performance commitments where the company had poor performance. In a number of cases, it sought significant additional funding to bring its performance up to upper quartile level such as for internal sewer flooding, water supply interruptions, and for its proposed leakage reduction. At draft determination we significantly increased the company's performance commitment levels on some common performance commitments to reach upper quartile, and we also significantly increased its performance commitment levels in asset health where the company is currently a poor performer.

4.4 Our final determination retained Yorkshire Water's proposed performance commitment levels where we considered these to be stretching but achievable and set at an appropriate level, for example water recycling, significant water supply events and low pressure. However, we also took account of wider

[127] Ofwat Service delivery report data – 2018-19, October 2019

evidence to assess achievability, including evidence provided by other companies where relevant (for example water supply interruptions).

4.5 Our final determination also retained Yorkshire Water's proposed ODI rates where the company had provided high-quality evidence that these reflected customers' preferences and would appropriately incentivise performance improvement; for example bathing water quality and surface water management. Where we did not consider the company's evidence to be sufficient, such as where they had not accurately reflected customer preferences, we intervened to set alternative ODI rates. The approximate financial value of each of the company's performance commitments is summarised in our final determination documentation.[128]

4.6 Table 4.1 highlights the key issues raised by Yorkshire Water in its submission in relation to outcomes and a summary of our response to each of those points.

Table 4.1: Key issues on outcomes raised by Yorkshire Water in its submission

Key issue in Yorkshire Water's submission	Summary of our response
Cost efficiency and performance The company states it manages its assets in a cost efficient way and that it has maintained a stable asset health position since 2005. The company also states it has a strong track record of meeting performance targets. The company states "The suggestion in Ofwat's YWS-Specific Paper that YWS's apparent cost efficiency may in fact reflect low activity levels in order to be low-cost instead of carrying out its activities efficiently is tantamount to suggesting that an underspend on costs amounts to underinvestment and therefore reflects poor performance." Statement of case, pp10-12, paragraphs 26-31	We agree with the company that its serviceability performance prior to 2015 has historically been largely 'stable'. However, we disagree with the statement that it manages its assets in a cost-efficient way. Yorkshire Water has the worst comparative sewer collapses performance. The company also has, on average, in the last 20 years, the joint lowest levels of sewer renewal and rehabilitation in the sector. We discuss this further in the paragraphs 4.13-4.23 below. The company has achieved 77%[129] of its performance commitment levels in the 2018-19 period although we consider in many cases levels were not stretching enough at PR14. We discuss this further in chapter 6 of our 'Outcomes – common issues' document.
Internal sewer flooding The company states that it has performed strongly in the area of internal sewer flooding and that its regional-specific factors (specifically	We do not agree that the company is a strong performer for internal sewer flooding. The company is currently the worst performer in the sector utilising the latest 'shadow reporting' information. In the current period, it has the highest number of internal sewer flooding incidents of any company. The

[128] Ofwat, PR19 final determinations: Yorkshire Water final determination, April 2020, chapter 2.2, pp. 25-26
[129] Ofwat, Service delivery report data – 2018-19, October 2019

the high proportion of cellars in Yorkshire) should not be disregarded when considering performance. Statement of case, pp13, 52-54, paragraphs 36-37, 160	company also states itself that it needs to 'significantly improve' its performance. We assessed the evidence provided by the company in relation to regional-specific factors as part of our price review process. The evidence attempted to demonstrate an apparent prevalence of cellars in the region and how this impacts service and costs for Yorkshire Water. We had significant concerns over the quality of evidence presented and its representativeness. We therefore rejected the claim on this basis. We discuss this further in paragraphs 4.24-4.49 below.
Costs and outcomes The company states that we set performance commitment levels interdependently [sic] of costs and that the stretch on outcomes was therefore an additional efficiency over and above that applied on costs. The company states that performance commitments are considerably more demanding compared to PR14 and that more revenue is at risk during the period. Statement of case, pp 22, paragraphs 67-68	We consider that our approach at PR19 examined the connection between costs and service. Our base models allow efficient companies to fund service improvements. The base expenditure incurred by companies in historical years (which is the input to our base models) include expenditure on previous performance improvement in areas such as supply interruptions, investment to address internal or external sewer flooding risk and pollution incidents. Therefore the modelled costs should reflect similar improvements. It is important that PR19 performance commitment levels reflect this. We think this is appropriate as some PR14 performance commitment levels were not demanding enough in some cases. However, the PR19 stretch is in line with what was achieved historically. We discuss the link between costs and outcomes further in chapter 2 of our 'Outcomes – common issues document', chapter 5 of this document and our 'Introduction and overall stretch document', chapter 4.
Changes to the performance commitment and ODI package The company states that we: materially changed the company's performance commitment and ODI package, that we had varied reasons for doing so that we replaced the views of the company's customers, and that the interventions were often large. Statement of case, pp 40-41, 50-51, paragraphs 123-126, 152-155, also Annex 05	Where we have intervened, we did so to protect customers' interests, noting that it is important that ODIs incentivise companies to improve in areas where historical performance has been poor. As we note in our 'Outcomes – common issues document', this includes setting asymmetric ODI rates for underperformance and outperformance where this is in customers' interests. Companies are funded to deliver performance improvements and mitigate external factors which may impede service delivery, so it is right that we set a stretching yet achievable package of performance commitments and ODIs. We discuss some of these issues further in paragraphs 4.50-4.57 below. We consider that our interventions related to customer engagement were based upon prudent and appropriate challenge of the results of the company's customer research and the extent to which it has used it to form the business plan, based on the wider set of information available to us. We discuss this further in the 'engaging customers' (chapter 2) above and our 'Outcomes – common issues' document, chapter 8.
Stretching and achievable The company states that our performance commitment level interventions are flawed because they don't align with the economically efficient level. The company	We consider that it was clear what we meant by 'stretching and achievable'. For a given level of costs, companies should not be able to easily achieve the level of service set. Rather, they should have to challenge themselves in the interests of their customers. However, we also said that performance commitment levels should be achievable, so

challenges the concept of 'stretching but achievable' levels which it states has no meaning in economic theory. Statement of Case, p 51, paragraphs 156-157	that the levels are realistic targets and companies can continue to finance their services. We consider that the level of service set should correspond to the level of cost allowance being spent in an economically efficient way. Customers should not pay extra costs to receive the efficient level of service nor should customers receive poorer service due to inefficiency of their monopoly provider. We also consider that performance commitment levels cannot be set purely on the basis of an analysis of marginal costs versus marginal benefits of service increments and decrements; it is generally not possible to identify an economically optimal performance commitment level for each performance commitment. We discuss this further in chapter 9 of our 'Outcomes – common issues' document.
Upper quartile performance commitments The company states that our approach to setting upper quartile performance commitments is unsound. It challenges our approach based on three key points. Firstly, that the forecast upper quartile is not equal to the economically efficient level, secondly that the approach does not take account of differences between companies and thirdly that companies are unlikely to be able to achieve upper quartile for multiple performance commitments. Statement of Case, pp. 52-54, paragraphs 158-161	**Forward looking upper quartile** We consider that cost benefit analysis in only one element to inform the setting of performance commitment levels. At PR19 we thought it inappropriate to set levels based solely on cost benefit analysis. We discuss this further in our 'Outcomes – common issues' document. **Company-specific differences** We have utilised the forward looking upper quartile for a limited number of performance commitments only. Furthermore, our approach and methodology enabled companies to submit evidence for consideration relating to unique circumstances. We considered the quality of evidence provided in relation to internal sewer flooding was insufficient and unconvincing and did not robustly demonstrate that the company was atypical. We discuss this further in the key issues section below (internal sewer flooding) and in our 'Outcomes – common issues' document. **Simultaneous achievement of upper quartile** We do not expect companies to be upper quartile on all performance commitments, as we are not expecting a company to be good at everything. We recognise that even an efficient company may be good in some areas and less good in others. We would, however, expect an efficient company, on average, to have net zero ODI payments. We discuss this further in our 'Outcomes – common issues' document.
Use of upper quartile The company challenges the appropriateness of utilising upper quartile performance targets by referencing the CMA redetermination for Bristol Water in 2015. 'Ofwat stated that it considered that (particularly for inefficient/poorly performing companies), the economic level was likely to be closer to the upper quartile performance level than the level	We consider that cost benefit analysis in only one element to inform the setting of performance commitment levels. We discuss these issues further in chapter 4 of our 'Outcomes – common issues' document.

proposed in the business plans. We considered this to be an overly simplistic representation of the circumstances. As was recognised in the assessment of leakage, local issues can significantly influence the true economic level of performance. Although the extent to which this is true will differ between metrics, we were not convinced that a blanket use of the industry upper quartile target was a superior method.' Statement of Case, p. 54, paragraph 161	
Leakage performance commitment levels The company states that our decision to set the performance commitment level for leakage at a 15% reduction was not supported by sound evidence. It states "it would appear that Ofwat used the fact that one company proposed a 14% reduction at PR14 as the basis for the PR19 15% leakage target for most companies. However, there is no economic or engineering rationale for why a 15% reduction is an appropriate target, or would coincide with the economically efficient level for YWS or indeed any other company." Statement of Case, p. 54, paragraph 164	Our policy direction with respect to leakage is in response to the future challenges faced by the industry and the limited progress made in driving down leakage levels over the past 15 years. The need to move to significantly reduce leakage levels has been accepted by other regulators, stakeholders and the industry. Yorkshire Water proposed a reduction of 15% with its base cost allowance in its representation on our draft determination. The company has not presented an alternative proposal for what could be achieved at no additional expense to customers. The challenge is similar to the highest proposed reduction at PR14 for the period 2015-20. In their business plans, all companies accepted the challenge and proposed at least a 15% reduction on an annual average basis. We discuss these issues further in our 'Cost efficiency – common issues' document, chapter 5, and in paragraphs 4.58-4.71 below.
Mains repairs and leakage The company states that we recognised the connection between leakage and mains repairs in our final determination but still imposed a 34% improvement for mains repairs over a five year period. It states that the probability of achieving this improvement in the context of the 15% leakage reduction target is 'low'. Statement of Case, p. 55, paragraphs 166-169	We consider that the performance commitment levels on mains repairs are challenging for the company due to admitted underinvestment in the asset base in previous periods. We also consider that the company's strategy of large increases in mains repairs to reduce leakage is not in line with the rest of the sector. The company did not use historical data showing the amount of leakage reduction from additional mains repairs to forecast the requirement of increased mains repairs to reduce leakage in the future. We discuss this further in paragraphs 4.72-4.78 below.
Company-specific circumstances and approach The company states that targets did not take account of the company's unique circumstances and that the approach in general relied on ill-thought out industry comparative assessments. It states that we could 'have undertaken its own robust	We consider that our methodology for the price review did clearly set out that company specific circumstances would be taken into account in setting our final determinations (for example through cost adjustment claims). We were clear that we would utilise comparative information in our assessments; especially for the common performance commitments. Comparative analysis is a key tool in setting performance commitment levels, analysing deliverability and assessing achievability. It would be remiss of us if we did

economic and engineering analysis (with suitable sensitivity checks) to form a view as to what the economically efficient level of outcomes could reasonably be expected to be.' Statement of Case, pp. 55-56, paragraphs 170, 174	not use comparative information available to us – we would be ignoring relevant information. We consider the onus should be on the companies to provide the data and evidence to demonstrate the appropriateness of the performance commitment level which we can then scrutinise; rather than us seeking to independently to determine the optimal level. We discuss these issues further in chapter 4 of our 'Outcomes – common issues' document. We provide further detail about company specific circumstances in the key issues sections below.
Water quality contacts The company states that the performance commitment levels for water quality contacts are extremely challenging due to the high proportion of upland water sources in its region and the type of pipes. The company states that our comparative assessments do not take account of Yorkshire Water's unique circumstances. The company also states that our approach fails to recognise the 'inevitable cost requirements' required to meet the targets we set. Statement of Case, pp. 56, paragraphs 171-173	We consider that our methodology for the price review did clearly set out that company specific circumstances would be taken into account in setting our final determinations. Our comparative assessments, and resultant performance commitment levels, challenged the company to catch up with its peers (based on 2018-19 data it is currently performing worse than the industry average) in an area that the company identified is of high importance to its customers. The company did not submit a corresponding cost adjustment claim or provide any quantitative cost information to support its case. We note that our final determinations allowed the company £51 million to address raw water quality and £13 million to address taste and odour issues. We discuss this further in paragraphs 4.79-4.91 below.
ODI rates The company states that our interventions on ODI rates are flawed because they move the company's rates arbitrarily closer to the industry average. It states that our interventions effectively replace the views of its customers. It further argues that our approach of making incentive rates 'more similar' implies variation is down to measurement error and that this could have been addressed through undertaking a single set of cross-company research. The company further states that our approach on rates assessed their appropriateness based on an arbitrarily defined reasonable range; that we intervened on the basis of PR14 rates despite a lack of comparability; and that our approach on rates is inconsistent on whether ODI rates around better levels of performance should be lower than	We consider that our interventions related to customer engagement were based upon prudent and appropriate challenge of the results of the company's customer research and the extent to which it has used it to form the business plan, based on the wider set of information available to us. We discuss this further in the 'engaging customers' (chapter 2) above. Variation between companies does not necessarily reflect genuine difference in customer's views, as opposed to differences in research methodologies or companies' approaches to triangulation. In fact we explicitly set out in our final methodology that we would compare companies' ODI rates at PR19 for the same performance commitment and challenge companies proposals where appropriate.[130] Our cross-check against equivalent ODI rates for the 2015-20 period is just one of seven tests that we apply to assess companies' rates. We consider this test provides a useful indication of whether a company is proposing a materially lower level of customer protection against incremental underperformance relative to the 2015-20 period. With respect to the company's claim that our approach to ODI rates should reflect diminishing returns, we note that the company does not explain why it considers our approach to be inconsistent nor provide any examples of this alleged inconsistency.

[130] Delivering Water 2020: Our final methodology for the 2019 price review, December 2017, Appendix 2, p. 90

those around worse levels of performance, in line with the concept of diminishing marginal returns. Statement of Case, pp. 58-59, paragraphs 177-181	We discuss this further in paragraphs 4.92-4.101 below.
Caps and collars The company states that our interventions in relation to caps and collars are flawed because they are based on misleading risk analysis and are designed to give rise to asymmetric risk. The company states that our general approach to intervening in caps and collars was based around 'transposing' and adjusting risk ranges estimated by companies. This approach has no sound evidential basis. In some cases, we set caps deliberately 'tighter' than it set collars. This contributes to the asymmetric risk that the company faces from our interventions. Statement of Case, pp. 59-61, paragraphs 182-187	Our approach to setting caps and collars was not designed to be asymmetric. Indeed, we imposed a collar wherever we imposed a cap, specifically to help counterbalance the cap. We did set caps differently from how we set collars, but this was to provide appropriate incentives. We discuss this further in chapter 11 of our 'Outcomes – common issues document'.
Downside skew The company states that our changes to performance commitment levels, incentive rates, caps and collars affects the financial risk that the company faces. It states that the company now faces a material downside skew. Statement of Case, pp. 59-61, paragraphs 183-187	We disagree that there has been an increase in the downside skew that Yorkshire Water faces. We consider that downside skew has reduced since PR14. We discuss this in chapter 2 of our 'Risk and return – common issues' document. Table 2.2 in that document shows there has been a reduction in the number of Yorkshire Water's ODIs where the underperformance rate is greater than the outperformance rate. The reasons that there is, and has been, downward skew in the ODI package is discussed out in chapter 11 of our Outcomes - common issues document However, based on our risk analysis Yorkshire Water is one of only two companies whose final determination ODI RoRE range implies greater scope for outperformance payments than underperformance payments. We therefore do not accept the company's argument that its ODI risk is asymmetrically tilted towards the downside. The company's experience from PR14 shows that it has been able to perform at the top end of its PR14 ODI RoRE range. We therefore consider that there is a fair chance of Yorkshire Water achieving positive overall ODI returns over 2020-25. We discuss further these points in relation to Yorkshire Water in our key issues section below on changes to the performance commitment and ODI package, paragraphs 4.50-4.57.

Considerations for the CMA

4.7 Our final determination set performance targets at stretching levels for Yorkshire Water but we considered these were achievable based on our analysis of historical improvements in the sector. In some cases the performance improvement required is significant (for example internal sewer flooding) but this is a reflection of the comparatively poor performance of the company in an area that is important to its customers.

4.8 The company is currently a poor performer on asset health metrics in particular. Our analysis also indicates that the company's historical low rate of sewer replacement and rehabilitation has resulted in the highest rate of sewer collapses in the sector. This has the potential to impact performance of sewer flooding and pollution incidents, both of which impact customers and the environment directly and both are areas where the company has comparatively poor performance. In its business plan the company acknowledges its poor performance on asset health and that it has not replaced the asset base at the rate it deteriorates.[131]

4.9 While we did make a significant number of changes to Yorkshire Water's performance commitment levels and ODIs over the course of the PR19 process, this does not mean that we overrode customer preferences. Rather, our interventions were designed to better align the company's outcomes package with customer interests, including ensuring performance commitments were in line with the costs the company was allocated.

4.10 We also do not consider that our interventions have created a material negative skew in Yorkshire Water's ODI risk exposure, as the company claims. Overall there is more opportunity to earn outperformance in the 2020-25 than the 2015-20 period. At PR14 a greater number of ODIs had underperformance rates that were greater than outperformance rates, than is the case at PR19.

4.11 In addition, we note that Yorkshire Water is one of only two companies where our analysis of the final determination implies there is greater scope for net outperformance payments than underperformance payments. This is considering the likely range on the return on regulatory equity (RoRE). We therefore do not accept the company's argument that its ODI risk is asymmetrically tilted towards the downside. The company's experience from PR14 shows that it has been able to perform at the top end of its PR14 ODI RoRE range. We therefore consider that there is a fair chance of Yorkshire

[131] Yorkshire Water, Exhibit 067-091 – IAP response - YKY.OCA1-A52 Delivering outcomes for Customers, chapter 1.5.3, p21

Water achieving positive overall ODI returns over 2020-25.It is important to note that, contrary to what the company claims, our process throughout PR19 did recognise and allow for company-specific circumstances in setting our outcomes package. Our final methodology was clear that we would consider such cases but that the evidential bar would be high. In outcomes, the company did not provide robust evidence that clearly and quantitatively demonstrated the uniqueness of the company's position.

4.12 Similarly, the company has focused on the challenging performance commitment levels we applied in our final determinations without recognising that in many cases it is performing poorly at a sector level and that customers should not have to pay for the company to catch up with its peers.

Our response to key issues raised by Yorkshire Water

Key issue – Cost efficiency and historical serviceability performance

4.13 Serviceability was a concept we used from 1995 to 2015 to monitor and incentivise high quality asset management, asset related performance and the service provided to customers. It was defined as 'the capability of a system of assets to deliver a reference level of service to customers and to the environment now and into the future'. It consisted of a set of standard measures aligned to company expenditure sub-service areas (water infrastructure, water non-infrastructure, sewerage infrastructure and sewerage non-infrastructure). We used infrastructure in this case to mean the underground network of pipes, and non-infrastructure to mean the above ground treatment works assets. An aggregation of the measures provided a sub-service assessment of serviceability which was either improving, stable, marginal or deteriorating. Companies were assessed against these criteria on an annual basis, with all companies required to maintain 'stable' serviceability. At PR09 and PR14 companies that failed to meet 'stable' serviceability were subject to regulatory financial penalties. At PR14, serviceability was discontinued, but most companies continued to include serviceability related measure(s) as performance commitments, albeit with alternative methodologies for determining individual measure performance and sub-service assessments.

4.14 Yorkshire Water disputes the suggestion that it conducted low levels of sewer replacement/rehabilitation activity to be low-cost rather than cost-efficient (the

reference is in relation to sewer collapses performance).[132] It states that it manages its assets in a demonstrably cost-efficient way and maintains stable levels of asset health and that this is demonstrated through its historical serviceability performance and its performance against its PR14 performance commitments.

4.15 We agree with the company that its serviceability performance prior to 2015 has historically been largely 'stable'.[133] However, we disagree with the statement that it manages its assets in a cost-efficient way.

4.16 We would like to draw the CMA's attention to these key points in relation to Yorkshire Water's historical serviceability and sewer collapses performance:

- the company's own serviceability methodology applied to its PR14 'Stability and Reliability' factors is complex and does not clearly set out how the performance of each sub-measure is assessed;
- against the PR19 common measure, Yorkshire Water has the worst comparative sewer collapses performance over the 2017-19 period; and
- the company also has on average, in the last 20 years, the joint lowest levels of sewer renewal and rehabilitation per kilometre of sewer in the sector.

4.17 We consider each of these points in turn below:

4.18 Between 2010 and 2015 the company maintained stable serviceability across all sub-services except for two years where water infrastructure serviceability was classed as 'marginal' due to mains bursts performance.[134] In the previous five year period (2005-10) it had deteriorating performance in sewerage non-infrastructure for two years and marginal performance for sewerage infrastructure in 2005.[135] Our analysis of Yorkshire Water's published annual performance reports shows that between the years of 2015 and 2019, it has reported stable service across all sub-services, although it has failed to meet its reference level of performance for individual measures 17 times over the four

[132] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp 10-11, paragraphs 26-27
[133] Serviceability was assessed as either 'Improving', 'Stable', 'Marginal' or 'Deteriorating'
[134] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020,p.11, paragraph 26, table 4
[135] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p.11, paragraph 26, table 4

years (out of a possible 80 – it reports on 20 individual measures every year).[136]

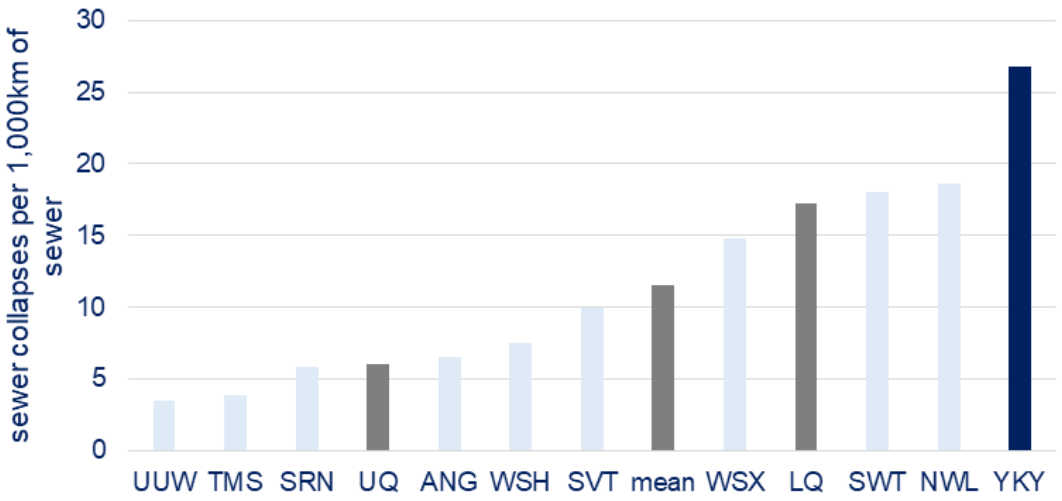
4.19 The company's PR14 document that sets out its methodology for assessing performance for its 'stability and reliability' factors does not set out how individual sub-measure assessments are undertaken; more detail on that particular process was provided in a document which was obtained through a query to the annual return assessments in 2019.[137] This document states that the assessment is aligned to our serviceability methodology, but there are clear differences, which mean its assessment is less stringent.

4.20 These include a reliance on breaches of the upper control limit (high level) to determine the assessment as opposed to our method which focused on deviation from the reference level. The process described is vague and open to interpretation. The company's process describes a complicated process for determining if a penalty should apply; it would only apply if a sub-measure was classed as 'deteriorating', whereas with our process penalties could apply for 'marginal' performance. There are also many mitigating factors that mean even if a sub-measure was deteriorating, a penalty may not apply. As a consequence it would take a very severe failure that the company had no plan to improve for a penalty to be applied. This can be seen in PR14 performance of mains bursts, which has failed the reference level two years in succession including 2018-19 where performance was above the upper control limit in one year, but does not trigger a penalty using the company's methodology.

4.21 The company's performance in sewer collapses has historically been comparable with the sector average using the serviceability definition. However, against the new PR19 definition, the company has by far the worst comparative performance in the sector. It provides charts in both its original business plan[138] submission and its response to initial assessment of plans to show this (see figure 4.1). It is not clear why its performance is comparatively worse using the new definition.

[136] Serviceability assessments are reported in the company's 'Annual Performance Reports' from 2014 onwards. Sub-service assessments are reported in Table 3A and sub-measure performance is reported in Table 3B.
[137] Y003, Yorkshire Water, The right outcome for Yorkshire (2015-2020) Stability and Reliability Factors, detailed response, September 2016
[138] Yorkshire Water, Exhibit 66-157, 33_Sewer Collapses_19c.pdf, Yorkshire Water business plan September 2018, pp. 3

Figure 4.1: Analysis from Yorkshire Water's September 2018 business plan showing comparative performance on sewer collapses for 2017-18



4.22 The company has the joint average lowest rate of sewer rehabilitation and renewal over the last 20 years. The average annual rate of renewal or rehab is 0.052% of the network, which is approximately half the 20 year sector average of 0.108%. The company's network is approximately 52,000km, therefore to replace the entire network at this rate would take approximately 1,900 years, which is considerably higher than the expected life of most sewers. The company states in its business plan that 'historically we have had very low sewer renewal rates, largely in the interests of affordability for customers.'[139]

4.23 The evidence suggests that the company's historical low rate of sewer replacement and rehabilitation has resulted in the highest rate of sewer collapses in the sector, which is an indication of the asset health of its sewer network. This also has the potential to impact performance of sewer flooding and pollution incidents, both of which impact customers and the environment directly and both are areas where company has comparatively poor performance (the company currently has the second worst pollution incidents performance and the worst internal sewer flooding performance).[140] In addition to this, its PR14 performance commitment levels and methodology for its 'stability and reliability' measures means that deterioration in performance has to be severe for penalties to apply, reducing the incentive to improve.

[139] Yorkshire Water, Exhibit 66-157, 33_Sewer Collapses_19c.pdf, Yorkshire Water business plan September 2018, pp. 3
[140] Ofwat, Service delivery report 2018-19, October 2019, pp. 21-24

Key issue - Internal sewer flooding

4.24 Internal sewer flooding is flooding with sewage that occurs within the boundaries of a customer's property. The internal sewer flooding common performance commitment measures the number of flooding incidents per 10,000 connections. Internal sewer flooding is one of three common performance commitments where we set a common performance commitment level across the industry; these were 1.68 incidents per 10,000 connections (2020-21) reducing to 1.34 incidents by the end of the period (2024-25).

4.25 The company states that our approach in setting the upper quartile performance commitment level takes insufficient account of Yorkshire's regional-specific factors and that its performance in this area is strong.[141]

4.26 We do not agree that the company is a strong performer in this area and the company acknowledges itself that it needs to significantly improve its performance.[142] We assessed the evidence provided by the company in relation to regional-specific factors as part of our price review process. We had significant concerns with the quality of evidence presented and its representativeness. We therefore rejected the claim on this basis.

4.27 We would like to draw the CMA's attention to three key points in relation to the company's arguments on internal sewer flooding.

- At a sector level, the company is currently the worst performer and, by its own admission, needs to significantly improve performance.
- We continue to have significant concerns with the quality of the evidence submitted in relation to cellars
- The company's proposed performance commitment levels have changed significantly over the course of the price review process raising concerns over the robustness of the approach adopted by the company in setting performance commitment levels.

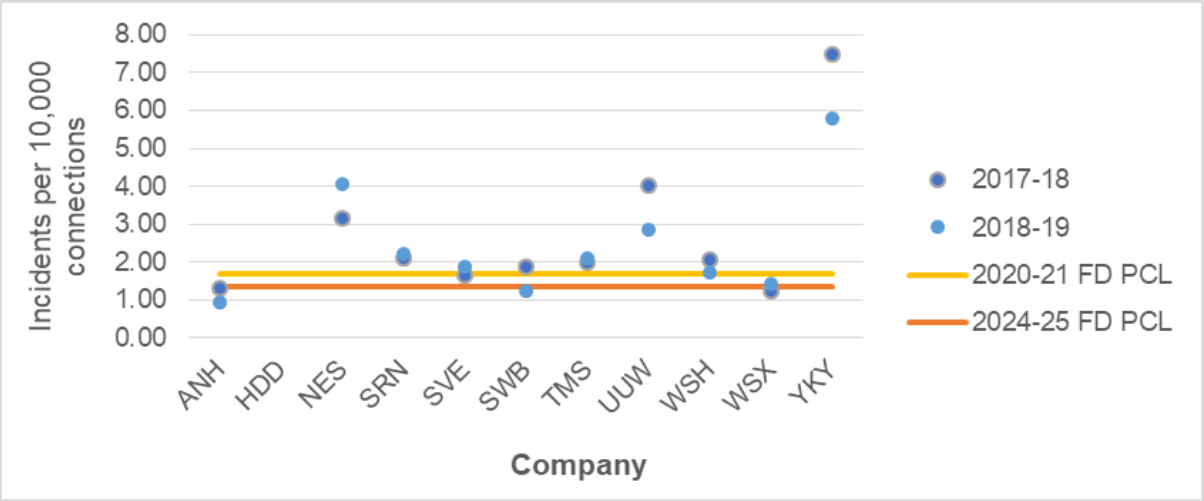
4.28 We consider each of these points in turn below.

[141] Yorkshire Water - PR19 redetermination Statement of Case, April 2020, pp.13, 52, paragraphs 36-37, 160.
[142] Yorkshire Water, Exhibit 66 - 155, 31_Internal Sewer Flooding_19c.pdf, Yorkshire Water, September 2018 business plan submissions, appendix 19c, internal sewer flooding, p.3

The company has the worst internal sewer flooding performance across the sector

4.29 Based on the most up to date data for the PR19 internal sewer flooding performance commitment the company is currently the worst performer across the sector (see figure 4.2). This information is based on 'shadow reporting' data so represents the most up to date view on company performance compared on a like for like basis with other companies.

Figure 4.2 Internal sewer flooding recent performance, proposed business plan (BP) levels and final determination performance commitment levels (PCLs).



4.30 The company states that its historical performance for internal sewer flooding is strong.[143] This is a misleading statement because it infers the company compares well against its peers and it does not take account of the outcomes framework in PR14. As noted in our 'Introduction to the CMA',[144] sewer flooding performance commitments were bespoke at PR14 and the adjustments we made in setting performance commitments levels made them less challenging for Yorkshire Water compared to other companies. The company acknowledges that these adjustments gave it a 'less demanding target'.[145] Therefore, while the company is achieving its current performance commitment

[143] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p.13 paragraph 36
[144] Ofwat, Reference of the PR19 final determinations: Explanation of our final determination for Yorkshire Water, paragraphs 1.12-1.13 including 'box1', also paragraphs 2.39-2.45
[145] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 53, paragraph 160(b)

levels, and earning outperformance payments, it is for performance that is poor at a sector level.

4.31 In its business plan the company submitted evidence (based on properties flooded) which clearly shows that Yorkshire Water is the poorest performer and a significant outlier when compared with the rest of the sector 'Our rate of flooding is 7.5 properties flooding per 10,000 connections, while half the sector is at or below 2.00 properties per 10,000'.[146]

4.32 In its submitted evidence the company states 'we note that historically when compared to other companies our performance is notably below average.' In other evidence the company also states 'we do not challenge the need to deliver improvement,'[147] and 'we know that we need to significantly improve our service to customers in this area.'[148]

4.33 The company's outturn performance in the most recent reporting year (2018-19) was 1,692 incidents. When compared against companies that also measure incidents (rather than properties) in 2015-20, this is more than double the next closest company in terms of poor performance (Severn Trent Water with 725 incidents in 2018-19).[149]

4.34 We consider the specific points raised by the company in relation to cellars in later paragraphs below, however, even if the impact of cellars is excluded, the company still seems to have the worst performance in the sector. This relationship can clearly be seen in the company's own business plan where, in 2017-18, the company delivered a performance of 7.5 properties flooded per 10,000 connections.[150] When the suggested impacts of cellars are removed, the company's performance is still the worst in the sector at approximately five properties flooded per 10,000 connections.[151]

4.35 The company's comparative poor performance is more concerning when costs are also considered alongside performance. At PR14, the company was allowed a sewerage totex allowance that was built up from a number of modelling approaches, including a unit cost allowance of £82.5 million to deliver

[146] Yorkshire Water, Exhibit 66 - 155, 31_Internal Sewer Flooding_19c.pdf, Yorkshire Water, September 2018 business plan submissions, appendix 19c, internal sewer flooding, p.3
[147] Yorkshire Water, Exhibit 070 -161019 Ofwat meeting YKY, p.15
[148] Yorkshire Water, Exhibit 66 - 155, 31_Internal Sewer Flooding_19c.pdf, Yorkshire Water, September 2018 business plan submissions, appendix 19c, internal sewer flooding, p.3
[149] Ofwat Service delivery report data – 2018-19, October 2019
[150] Yorkshire Water, Exhibit 66 - 155, 31_Internal Sewer Flooding_19c.pdf, Yorkshire Water, September 2018 business plan submissions, appendix 19c, internal sewer flooding, p.3
[151] Yorkshire Water, Exhibit 66 - 155, 31_Internal Sewer Flooding_19c.pdf, Yorkshire Water, September 2018 business plan submissions, appendix 19c, internal sewer flooding, p.4

improvements in sewer flooding performance. The company's actual costs for the 2015-20 period show that only £39.8 million has been spent. We consider that had the company spent its full allowance, the performance challenges in 2020-25 could be notably mitigated.

We have concerns with the quality of evidence provided in relation to cellars

4.36 We do not agree that our approach on upper quartile performance commitments did not take account of differences between companies. It was clear in our PR19 final methodology that we would consider atypical costs associated with regional specific variations.[152] We assessed the company's evidence (a cost adjustment claim) as part of our initial assessment of plans and considered it to be insufficient and unconvincing.[153] We rejected the claim and the company did not re-submit it in later submissions.

4.37 In its September 2018 business plan submission the company submitted a cost adjustment claim for £105.9 million in order to deliver a '70% reduction' in internal sewer flooding incidents.[154] The cost adjustment claim stated that: the company had a high proportion of cellars in its region; that the cellars were prone to flooding; and the costs required to meet upper quartile performance commitment levels, or a 70% reduction, were therefore atypical.[155]

4.38 The assessment of the claim is summarised in our published feeder model[156] but we would like to draw the CMA's attention to four key points:

- the evidence provided was out-dated and the company made no attempt to update it, validate any findings, specify how and why it was representative and presented inconsistent findings;
- the company did not set out quantitatively how and why it regards cellars in its region have a greater tendency to flood and what the root cause of the flooding is;
- the company did not provide evidence of a symmetrical assessment; specifically how the number of cellars in a region affects all companies to different degrees so as to increase and decrease our allowance for each

[152] Ofwat, Delivering Water 2020: Our final methodology for the 2019 price review, December 2017, p148
[153] Ofwat, Final determination models, 11 – cost adjustment claims feeder models, Yorkshire water
[154] Yorkshire Water, Exhibit 038.1 – Ofwat Proforma, September 2018 business plan submissions, appendix 8ki, pp. 2-3
[155] Yorkshire Water, Exhibit 038.1-3 - Yorkshire Water's September 2018 business plan submissions, appendix 8ki-vi
[156] Ofwat, Final determination models, December 2019, 11 – cost adjustment claims feeder models, Yorkshire water

company. We outlined our expectations of such a symmetrical approach in our final methodology[157] and this was to mitigate the risk, highlighted by the CMA in its 2015 re-determination of the Bristol Water's price control,[158] that without it, cost adjustment claims would be more favourable to water companies than consumers through the one direction of positive additions to a company's allowance; and

- the company did not provide evidence as to why its stated housing density distribution ('back-to-backs') exacerbated the issue.

4.39 We address each of these points in turn below.

4.40 The research provided by the company is over 20 years old and it is unclear how representative it is. The results appear to be based on a small sample size (110 interviews) of customers who had experienced flooding of either water or sewage and asks those who have experienced such flooding in 1998 whether they have cellars. The company provided limited information on how the sample and structure of the survey was representative of its own (or other companies') regions, nor how the survey demonstrated that it has more properties with cellars than other regions. We appreciate the history of UK house building, but in order to make an allowance we would expect high quality evidence of regional differences so we could apply any additional cost allowance or relaxation of performance commitment level in a fair and symmetrical way across the industry. The company also appears to state inconsistent values; it states both 63%,[159] 69%[160] and 70%[161] as estimates for the amount of flooding occurring in cellared properties.

4.41 In addition, we were concerned that the company had not attempted to validate the findings; an important point considering the date of the research. There was no evidence provided of recent work undertaken by the company to check that the original research is still valid and relevant. We consider this is a serious shortcoming given the scale of redevelopment in some of the northern areas of the country. Research from the English housing survey suggests that the proportion of dwellings with basements may be on the rise in post 1990 dwellings.[162] Similarly, the company provided limited evidence regarding why its

[157] Ofwat, Delivering Water 2020: Our final methodology for the 2019 price review, December 2017, p.149
[158] CMA, Bristol Water, A reference under section 12(3)(a) of the Water Industry Act 1991, Report, paragraphs 3.33, 4.63 and 4.256
[159] Yorkshire Water, Exhibit 038.2, Ofwat evidence, September 2018 business plan submissions, appendix 8kii, Ofwat Evidence, p.5
[160] Yorkshire Water Exhibit 038.1, Ofwat proforma, September 2018 business plan submissions, appendix 8ki, p.3
[161] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p.13, paragraph 37, 160(a)
[162] English housing survey 2008 housing stock report: chapter 1 annex tables

region is different to areas such as central London that are known to have a high population density and high proportion of properties with basements.

4.42 The company provided limited quantitative, engineering-based evidence of the link between cellars and the increased risk of internal sewer flooding instead relying on empirical statements and descriptions. There was limited information provided on the root cause of flooding in cellars (for example whether incidents were caused by blockages or hydraulic overload). Understanding root cause is critical since it will impact the type of solution offered, the timing over which it can be delivered and its cost. In some evidence, the company stated that across all incidents (therefore region-wide), over 50% are caused by blockages.[163] Jetting and customer education are some of the primary ways to resolve blockages. However, the company states that the performance commitment levels are unachievable because the company cannot gain access to cellars to install retrofit measures.[164]

4.43 Furthermore, the company fails to quantitatively demonstrate in its evidence what its sewer flooding performance would be, with and without the impact of cellars. We consider the company must be able to demonstrate that without the impact of cellars its performance would be in line with the rest of the sector. Our assessment summarised above suggests that even without the purported impacts of cellars, the company would still be an outlier. Additionally, the company provides no quantitative information on what proportion of cellars in its region are actually connected to the sewer and therefore potentially may represent an increased sewer flooding risk.

4.44 In addition, the company states that extreme weather creates a significant challenge in achieving the performance commitment levels as well as the high proportion of cellars.[165] The company provided insufficient evidence to demonstrate a relationship with extreme weather and what the commensurate impact is alongside cellars.

4.45 As stated in our final methodology we expected companies to provide a symmetrical view of atypical costs and consider factors that can increase and decrease costs. The evidence presented by the company in relation to cellars did not consider other factors that might increase the costs associated with

[163] Yorkshire Water, Exhibit 66-155, Yorkshire Water, September 2018 business plan submissions, 31_appendix 19c, internal sewer flooding, p4
[164] Yorkshire Water, Exhibit 040, Ofwat Annex Y001 letter NM to DB 01-11-19, November 2019, p. 2
[165] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp. 52-54, paragraph 160(c)

sewer flooding that other companies may experience; for example companies that experience higher rainfall than Yorkshire Water.

4.46 The company also states that the 'back-to-back' nature of properties in its region leads to multiple properties being impacted by flooding; an argument not emphasised in its original submission.[166] Limited quantitative evidence was presented to support this argument including why its region is different to a region such as central London with its density of basement properties. Furthermore, the company did not outline in its evidence why the apparent higher housing density did not make a single, area-based solution an option for consideration to address the flooding (for example a single hydraulic or educational solution to benefit these areas of back-to-back housing rather than a single solution per property).

4.47 The costs and benefits submitted by the company as part of its claim were predicated on the delivery of a 70% improvement in performance. In its late draft determination representation the company significantly reduced the ambition on its performance commitment levels (the 2024-25 performance commitment level deteriorated from 323 incidents to 550 incidents). The company has not reflected the revised performance commitments levels in either its atypical costs, customer research or cost benefit analysis.

We are concerned that the company does not fully understand and consistently evidence the factors driving its performance

4.48 We consider the company's approach to proposing performance commitment levels has been inconsistent and erratic which potentially raises concerns about the robustness of the company's approach. As discussed in our Introduction to the CMA[167] the company initially proposed a 2024-25 performance commitment level slightly higher than the upper quartile performance commitment level set in the final determination. In later submissions, the company did not propose new levels. It was only in November 2019, in a late representation, that the company updated the performance commitment levels to make them significantly less ambitious.

4.49 We note that companies were involved in developing the PR19 metrics and that they have three years to prepare for implementation. The company therefore knew at the time of its original business plan how challenging it would be and how poorly it was performing. We note at the time of business plan submission

[166] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p.53, paragraph 160(a)
[167] Ofwat, Reference of the PR19 final determinations: Explanation of our final determination for Yorkshire Water; April 2020, p.26, paragraphs 2.40-2.45 including figure 2.1

in 2018 that the company had only spent £24 million of its allocated £82.5 million enhancement funding to improve sewer flooding. We re-iterate again that the latest data shows that the company will only have spent £39.8 million by the end of the 2015-20 period.

Key issue – Changes to the performance commitment and ODI package

4.50 Yorkshire Water claims that we made a large number of changes to its performance commitment and ODI package, which together increased downside financial risk more than they increased upside financial risk. As part of its statement of case, the company provides a report from Economic Insight which analyses the nature of our ODI interventions and estimates their financial impacts.[168] This report argues that our interventions to performance commitment levels and ODI parameters were widespread and often highly material.

4.51 We did make a significant number of changes to Yorkshire Water's performance commitment levels and ODIs. But as we explain in chapter 5 of our 'Outcomes – common issues' document, we did this in order to better align with customers' interests and preferences rather than to move away from them.

4.52 The Economic Insight report highlights the number of changes we made to Yorkshire Water's ODI package, but it also acknowledges that our interventions were broadly balanced between increasing and decreasing the potential for Yorkshire Water to earn net positive incentive payments. As an exception, the report argues that our changes to performance commitment levels are 'heavily skewed towards 'more demanding' targets'.[169] However, the report fails to mention that two of our most financially material performance commitment level interventions were large reductions in the stretch applicable to water supply interruptions and leakage. The scale of these stretch reductions was significantly greater than almost all interventions where we increased stretch on other performance commitment levels. We therefore consider the quoted statement to be somewhat misleading. Contrary to the report's claims, we consider that our performance commitment and ODI interventions both increased and decreased the potential for net positive incentive payments.

4.53 Moreover, as the Economic Insight report acknowledges, our ODI interventions include a series of measures which collectively reduce Yorkshire Water's

[168] Yorkshire Water, Annex 05 – Economic Insight - Ofwat's approach to ODI interventions in the Final Determinations
[169] Yorkshire Water, Annex 05 – Economic Insight - Ofwat's approach to ODI interventions in the Final Determinations, p.20

exposure to extreme downside ODI risks. These include sizeable reductions to enhanced underperformance ODI rates, increasing the number of standard and enhanced ODI collars and loosening enhanced ODI thresholds (which restricts the performance range over which enhanced ODI rates apply). Taken together, these interventions have substantially increased Yorkshire Water's financial protection from extreme downside performance scenarios, such as severe weather events.

4.54 It should be noted that the above interventions were introduced in conjunction with similar interventions to outperformance ODI payments which restrict Yorkshire Water's upside ODI risk. These include the introduction of standard and enhanced outperformance caps, loosening enhanced ODI thresholds and reductions to enhanced outperformance ODI rates. We acknowledge that these interventions restrict Yorkshire Water's upside ODI potential, and they balance the interventions described above which limit extreme downside risk. Nonetheless, we consider it is important to emphasise that we have intervened to reduce extreme downside risk, given that Economic Insight considers Yorkshire Water's ODI risks from final determination to be heavily downward skewed.[170]

4.55 We disagree with the Economic Insight report's commentary on the financial impact of our ODI interventions, which we consider to be one-sided and misleading. In chapter eight of its report, Economic Insight estimates the financial impact of our ODI interventions in several ways. Section 8.2 highlights two performance commitments where we materially increased the stretch required to meet performance commitment levels to efficient levels – namely mains repairs and external sewer flooding – and Economic Insight uses this to argue that our interventions have a large negative impact on expected ODI returns. We find this commentary misleading for three key reasons:

- Firstly, the increase to the performance commitment levels was to better align them with what we consider an efficient company should achieve. This should not create a negative financial impact for an efficient company, although it may do so for an inefficient company. We discuss this further in the 'engaging customers' (chapter 2) above and our 'Outcomes – common issues' document;
- Second, Economic Insight omits to mention that, as well as increasing stretch for these two performance commitments, we also intervened to reduce its ODI rates by over 50%. We made these interventions in consideration of the balance of incentives across Yorkshire Water's ODI

[170] Yorkshire Water, Annex 05 - EI - Ofwat's approach to ODI interventions in the Final Determinations, pp.42-43

package (as well as a number of other factors), ensuring that the company's incentives are not disproportionately focused on a small number of performance commitments. We also introduced a collar for external sewer flooding, which Yorkshire Water had not proposed in its business plan, in line with other companies. Both of these interventions have materially reduced downside financial risk, and the overall impact of our ODI interventions for these performance commitments is much more balanced than Economic Insight implies and

- Thirdly, the analysis focuses on two selective performance commitments and does not consider the broader suite of interventions we made across Yorkshire Water's ODI package. There is a clear dissonance between the report's analysis of performance commitment and ODI interventions in chapter five, which finds that our interventions were broadly balanced in their impact on ODI returns, and chapter eight, which implies that our interventions have had a material negative impact on expected ODI returns.

4.56 Finally, we considered the overall impact of each companies' ODI package following our interventions. The approach we took to understand risk in our final determinations, while pragmatic, was sufficient to support our conclusion that no company faces undue downside risk. In chapter 12 of our 'Outcomes – common issues' document, we respond to the company's view that Ofwat should have conducted its own stochastic analysis (using techniques like Monte Carlo modelling) in order to quantify ODI risks for each company. As we explain, it would not have been practical for us to conduct such analysis robustly without deciding to do this (and consulting on this with companies) in advance of the price review. Moreover, this would not necessarily have resulted in a more robust view of ODI risk.

4.57 We do not think that Yorkshire Water's analysis of risk is accurate. Many of Yorkshire Water's P10 and P90 estimates were significant outliers compared to those of other companies. There was little or no evidence that this was due to factors outside management control. In our risk analysis we intervened to provide greater consistency in understanding risk across the industry. The result of our analysis is that Yorkshire Water is one of only two companies for which the final determination implies there is greater scope for net outperformance payments than underperformance payments.

Key issue - Leakage

4.58 As we set out in our 'Cost efficiency – common issues' document, chapter 5, leakage is a high profile and important issue for customers, companies and regulators. Reducing leakage levels is important for ensuring resilient future supplies as we are faced with challenges such as climate change and population growth. The need to make significant reductions in leakage is recognised by companies, regulators and other key stakeholders, including The National Infrastructure Committee and National Audit Office.

4.59 In its statement of case Yorkshire Water argues that it does not receive sufficient allowance to achieve its proposed leakage reductions and that the final determinations do not enable it to deliver to its customers priorities.[171]

4.60 In both its September 2018 and revised April 2019 business plans the company proposed a leakage reduction performance commitment level of 25% by 2024-25. While this was the highest leakage reduction proposed by any company it was accompanied by an enhancement funding claim of £250 million in September 2018 which it reduced to £137 million in April 2019. In its representations on our draft determinations the company withdrew its enhancement funding claim and proposed a less stretching leakage performance commitment level of a 15% reduction by 2024-25.

4.61 For Yorkshire Water, we accepted the company's proposal of a 15% leakage reduction on a three-year average basis to be delivered through its base allowance. This is expected to deliver at least a 15% improvement on 2019-20 levels on an annual average basis.

4.62 In its statement of case to the CMA the company raised the following issues with respect to its allowance for leakage reduction:

- Yorkshire Water has historically performed strongly in leakage reduction and included efficient costs for reducing leakage in its business plan. Our imputation that this was a recognition of relative poor performance has no basis and is simply misleading.[172]

[171] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 54, paragraph 162-165
[172] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 12, paragraphs 31-34

- Ofwat has forced customers to accept a lower leakage target than the company was prepared to commit to. The company set a target of 25% reduction to address customers stated requirements.[173]
- The company also raises the more general issues that the 15% leakage reduction target lacks rationale and that we made a significant change in policy by moving away from the sustainable economic level of leakage approach to leakage performance level setting.

4.63 We consider there is a need to challenge the industry to do more to deliver the reduction in leakage levels required to ensure future resilience for customers. Our policy aims to encourage companies to innovate, exploit new technologies and revise business processes to reduce leakage, rather than just doing more, using the same techniques as in the past. We do not consider that the continued use of sustainable economic level of leakage in setting performance commitment levels would drive the industry to deliver the reductions necessary in the long-term. We have set out this position in our PR19 methodology in 2017 to the industry. We discuss our setting of performance commitment levels and view of the sustainable level of leakage in further detail in our 'Cost efficiency – common issues' document, chapter 5.

4.64 We respond to the company-specific points raised by Yorkshire Water below.

4.65 With regards to the company's point about its current performance, while the company has met its 2018-19 leakage performance commitment level, its comparative performance on leakage is relatively poor. The company is currently a lower quartile performer in terms of its comparative leakage levels when normalised by mains length and on a per property basis.[174] Furthermore the company's leakage levels in terms of 3-year average have increased in the five year period leading to 2018-19. We therefore consider our statements about Yorkshire Water's current and recent historical performance to be well founded.

4.66 With regards to the company's argument that we have forced customers to accept a lower leakage target than the company was prepared to commit to, we recognise that leakage reduction is an important issue for customers. However, we do not consider that the company provided sufficient evidence that customers supported the 25% reduction across the five year period. We raised

[173] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 55, paragraph 165
[174] Based on 2018-19 annual performance report data, leakage normalised in terms of cubic meters per kilometre of mains per day (m^3/km/d) and litres per property per day (l/prop/d)

this issue in our representation on the company's water resources management plan in June 2018.[175] We challenged the company to provide evidence to demonstrate that a significant reduction in leakage over the short term, beyond the level of the 15% challenge, was most effective for customers and the environment considering there were other lower cost demand management options in its water resources management plan that the company had not selected.

4.67 From our review of the customer engagement information provided by the company in its water resources management plan, we observed that 59% of customers were not willing to pay more for leakage reduction or thought that leakage reduction should continue at its current rate (which is lower than 15%).[176] Therefore while customers recognised that leakage reduction was an important issue we did not consider that the company had demonstrated support for its significant reduction and related bill increase over the short term.

4.68 Furthermore, it is also notable that while Yorkshire Water proposed the highest leakage reduction, its own PR19 willingness to pay research suggests that leakage is a lower priority for its customers compared to those of other companies. Despite our intervention to increase Yorkshire Water's leakage ODI rate, in our final determination, it remained in the lower quartile of rates (on a normalised basis) across the industry. This is not commensurate with its customers wanting to fund the highest leakage reduction target in the sector (given Yorkshire Water states that it would require £137 million of enhancement funding to deliver the leakage reduction of 25%). We also note that the company only tested leakage reduction up to 15% in its willingness to pay research.

4.69 Similarly, the broader PR19 customer research results submitted by the company in its September 2018 Business plan do not unequivocally demonstrate that customers support a 25% leakage reduction target. The company's outcomes research (see excerpt in figure 4.3 below) shows that customers ranked leakage seventh out of 10 performance commitments tested with customers and we were unable to find any evidence of customer research that tested specific levels of leakage reduction with customers.[177] It is therefore

[175] Yorkshire Water draft WRMP19 consultation response, June 2018
[176] Yorkshire Water, Revised Draft Water Resources Management Plan 2019, September 2018, p. 315, table 17.2 (note link to the webpage containing the plan is included in Exhibit 66-100 - Appendix 16a - Water Resources Management plan)
[177] Yorkshire Water, Exhibit 066-017, Appendix 5a - Customer and Stakeholder Engagement.pdf, September 2018 Business Plan, Appendix 5a - Customer and Stakeholder Engagement, p. 81

not at all clear that Yorkshire Water's customers' supported the 25% reduction it proposed over the 15% reduction in our final determination.

Figure 4.3: Excerpt from Yorkshire Water's outcomes customer engagement results

Table 12 Relative ordering of importance for performance commitments

Rank	Performance commitment	
1	Drinking water quality: compliance risk index	
2	Drinking water quality: event risk management	
3	Taste/smell/colour	
4	Time taken to repair reported customer leaks	
5	Internal sewer flooding	
6	Water recycling	
7	Leakage	
8	Affordability	
9	Bad debt	
10	Helping customers in vulnerable circumstances	

4.70 The company identified a number of feasible options to reduce leakage within its water resources management plan. In the water resources management planning process, a company produces a least cost plan to deliver drought resilience by optimising between the available options. However, for Yorkshire Water there was limited evidence that its plan represented an optimised programme with respect to leakage. This is because to deliver the 25% reduction required it to select all possible options, so no optimisation was possible.[178] We note that after 2025 the rate of leakage reduction in the company's water resources management plan reduces significantly.[179] The company did not demonstrate that this profile of immediate and large scale leakage reduction represented the best value route to long-term leakage reductions for customers and the environment.

4.71 Finally, we note that the company can receive funding to deliver leakage reductions beyond its 15% performance commitment level in the form of cost sharing and ODI outperformance payments. While the company's ODI outperformance rate (before adjustment for totex sharing) is significantly lower

[178] Review of Yorkshire Water, Revised Draft WRMP19 Grid Surface Water Zone data table, Table 5. Feasible Options.
[179] Yorkshire Water, Revised Draft Water Resources Management Plan 2019, September 2018, p. 250, section 10.3.1

than its requested unit cost for leakage enhancement (£2.03 million compared to £0.278 million, respectively) it remains higher than Yorkshire Water's reported marginal cost of leakage reduction (£0.069 million) as submitted in support of its leakage ODIs. Furthermore, we note that the fact the company's ODI rate (based on willingness to pay) is less than its requested enhancement unit cost further undermines the company's argument that its customers support it being funded to deliver a 25% reduction in leakage.

Key issue - Mains repairs and leakage

4.72 Mains repairs is one of the four asset health performance commitments. The number of mains repairs is a long standing measure and an important indicator of the health of a water company's assets. An increase in the number of mains repairs over time can indicate a deterioration in the health of the network and underinvestment in (or poorly targeted) mains replacement and renewal. There is some evidence to suggest a link between mains repairs and leakage; this was reflected in our final determinations. We provided a summary of the mains repairs performance commitment and linkages to leakage in our 'Introduction to the CMA' documents.[180]

4.73 The company states that we recognised the connection between leakage and mains repairs in the final determination but still imposed a 34% improvement over a five year period. It states that the probability of achieving this improvement in the context of the 15% leakage reduction target as 'low'.[181]

4.74 At draft determination we considered that the evidence provided by companies of the link between leakage and mains repairs was unconvincing. Therefore, we made no allowance in the setting of performance commitment levels. In response to the draft determinations, companies provided further data and analysis. This additional evidence showed that there is a link between leakage and mains repairs activity. We therefore further increased the level of the mains repairs performance commitment levels in our final determinations for all companies by a reducing percentage in each year of the 2020-2025 period,

[180] Ofwat, Reference of the final determinations: Key elements of the methodology appendix, April 2020, chapter 4, pp. 9-12
[181] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 55, paragraphs 166-169

thereby reducing the degree of stretch.[182] We consider that we have recognised the link and made adjustments to performance commitment levels accordingly.

4.75 We provided a full summary of our assessment for Yorkshire Water's mains repairs performance commitment levels in our final determination.[183] However, we would like to draw the CMA's attention to the following key points.

4.76 The company indicated that during the 2012-13 to 2016-17 period it did not conduct enough mains repairs to maintain stable levels of leakage. It stated that it purposely increased its pro-active mains repairs rate in the last two years to help arrest this rise, but it had limited impact due to severe weather events.[184] The increased activity on mains repairs was around 30% higher from its PR14 performance commitment level, far higher than any other company forecasts, in order to reduce leakage (South East Water is the next highest at 14%). Moreover, there were limited incentives for Yorkshire Water to reduce its mains repairs because the PR14 mains repair performance commitment was a part of its 'basket' of associated service measures and failure of one measure in this basket did not automatically trigger an underperformance payment. It was therefore able to increase mains repairs (or deteriorate in performance) without triggering a PR14 asset health underperformance payment.

4.77 The 34% reduction quoted by the company needs to be understood in the context of the increase of 30% in mains repairs actual performance from its PR14 reference level of performance. We consider that the company failed a PR14 performance commitment because there was no prospect of short-term financial consequences. It continued to consider mains repair its main method to improve leakage performance, whereas other companies, such as Affinity Water, have stated that it no longer considers leakage reduction as a major factor in its mains repairs performance.[185] Other methods to improve leakage performance are available such as mains replacement, customer side pipe repairs/replacement and various operational methods. Furthermore, we consider the company has over-stated the performance improvement required. Based on the latest 2019-20 forecasts provided, the improvement required over 2020-25 is 28%.

[182] Ofwat, Reference of the PR19 final determinations: Key elements of the methodology appendix, April 2020, chapter 4
[183] Ofwat, PR19 final determinations Yorkshire Water – delivery outcomes for customers additional information appendix, chapter 2, pp. 6-10
[184] Yorkshire Water, Exhibit 040, Ofwat Annex Y001 letter NM to DB 01-11-19, November 2019, NM letter to David Black, p,11
[185] Ofwat, PR19 final determinations: Affinity Water – Delivery outcomes for customers final decisions, December 2019, p. 2

4.78 The company did not use historical data showing the amount of leakage reduction from additional mains repairs to forecast the requirement of increased mains repairs to reduce leakage in the future. It provided data to show the recent historical impact of additional mains repairs on leakage reduction, but did not use this data to forecast future additional mains repairs to meet leakage reduction requirements. Therefore the company does not demonstrate the leakage reduction it will gain from its forecast mains repairs levels.

Key issue - Water quality contacts

4.79 This performance commitment incentivises companies to improve the appearance, taste and odour of drinking water by measuring the number of consumer contacts the company receives in relation to the appearance and taste and odour of drinking water. It was an option for companies to select for their bespoke asset health performance commitments from the asset health 'long list' in our final methodology.[186] This performance commitment is one of five that the company's customers most want to see improvement against.[187]

4.80 Customers usually contact their company about the appearance, taste and odour of their water as a result of issues such as disturbance of deposits in the network, the use of chlorine as a disinfectant, seasonal water quality effects or a change in the source of water. Companies can mitigate customer contacts through a range of activities including: optimising drinking water treatment processes, utilising granular activated carbon in treatment, active water quality monitoring, proactive mains cleaning/flushing programmes, proactive education with customers on the causes of taste/odour variations and clear communication when work is happening which may temporarily affect supplies.

4.81 The company states that the performance commitment levels for water quality contacts are extremely challenging due to the high proportion of upland water sources in its region and the prevalence of cast iron mains in its network. The company also states that our comparative assessments do not take account of Yorkshire Water's unique circumstances, and that our approach fails to recognise the 'inevitable cost requirements' required to meet the targets we set.[188]

[186] Ofwat, Delivering Water 2020: our methodology for the 2019 price review; December 2017, Appendix 2: Delivering outcomes for customers, p. 28
[187] Yorkshire Water, exhibit 66-150, September 2018 business plan submissions, 26_appendix 19c, water quality contacts, p3
[188] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp. 55-56, paragraph 170-173

4.82 We consider that our methodology for the price review clearly set out that company specific circumstances would be taken into account in setting our final determinations. Our comparative assessments, and resultant performance commitment levels, challenged the company to catch up with its peers. Based on 2018-19 data it is currently performing worse than the industry average in an area that the company identified is of high importance to its customers.[189] The company did not submit a corresponding cost adjustment claim but we note that our final determinations allowed the company £64 million to address raw water quality and taste and odour issues.[190]

4.83 In its September 2018 business plan the company originally proposed a static profile of 11.3 contacts per 10,000 population in each year of the 2020-25 period. This represented only a 7% improvement to customer service based on the 2019-20 forecast outturn. We considered this did not reflect the importance its customers placed on improving performance, especially considering the company delivered a 40% improvement in contacts over a five year period between 2013-14 and 2018-19.[191] We asked the company to reconsider its performance commitments levels.[192]

4.84 In its April 2019 revised business plan the company stated it did not adjust its performance commitment levels because 'in the current reporting year, we are experiencing higher levels of customer contacts than expected due to increased activity on the network to address business pressures associated with Beast from the East, summer demand, moving GRID Water around for resilience, and improved leakage drive.'[193] The company provided no quantitative evidence explaining why the number of upland sources or the proportion of cast iron mains made further customer service improvements impossible.

4.85 The company also stated that 'both the winter and summer weather conditions have resulted in high levels of demand from our customers. This high demand has manifested in disturbance of historic sediment and occurrence of discolouration in areas not previously expected to be significantly impacted'.[194] Again, no references were made to upland sources and we were concerned

[189] Ofwat Service delivery report data – 2018-19, October 2019
[190] Ofwat, PR19 final determination models; section 7; enhancement feeder models; raw water deterioration; and taste, odour, colour, December 2019
[191] Ofwat Service delivery report data – 2018-19 October 2019
[192] Yorkshire Water: Delivering outcomes for customers detailed actions, p26
[193] Yorkshire Water, Exhibit 067-091, IAP response YKY.OC.A1-A52: Delivering outcomes for customers, p53
[194] Yorkshire Water, Exhibit 067-091, IAP response YKY.OC.A1-A52: Delivering outcomes for customers, p53

that this information indicated the company had poor knowledge of its network, its configuration, and the root cause of customer service impacts.

4.86 We understand that at times of high demand, and to ensure resilience, companies may want to move water around their network and that this can create customer contacts as the source/blend of water changes and flow changes potentially disturb sediment. However, these challenges are experienced by all companies and can be mitigated through robust systems knowledge and effective network operation and management. Furthermore, the company did not provide any quantitative engineering-based analysis of the impact of these events or analysis of root cause. The company only states 'using our resources in this manner to assure long term security of supply has resulted in some upward pressure on contact rate.'[195]

4.87 We considered the points the company raised were not company specific and impacted all companies. This was reflected in our draft determination intervention to set performance commitment levels on an improving profile from 11.4 contacts per 10,000 customers (2020-21) to 8.1 contacts per 10,000 customers (2024-25).[196] These performance commitment levels were based on sector-wide comparative analysis and we considered they reflected the importance and desire for service improvement expressed by the company's customers.[197] [198]

4.88 The company did not make any representation on this performance commitment following draft determination and we made no further intervention so the performance commitments levels were set at this level in our final determinations. The performance commitment levels require the company to deliver a 34% improvement in performance over the period. Five companies have a greater level of performance improvement to deliver and four companies have to deliver a similar level.

[195] Yorkshire Water, Exhibit 067-091, IAP response YKY.OC.A1-A52: Delivering outcomes for customers, p53
[196] Ofwat, PR19 draft determinations, Yorkshire Water – Delivering outcomes for customers actions and interventions, December 2019, p. 20.
[197] Ofwat, PR19 draft determinations: Delivering outcomes for customers policy appendix, December 2019, chapter 3.4.4, pp.40, 42-43
[198] Yorkshire Water, Exhibit 66-150, September 2018 business plan submissions, 26_appendix 19c, water quality contacts, p.3

Table 4.2 Levels of performance improvement required based on our final determination decisions

Type of performance challenge	Companies[199]	Change from 2019-20 to 2024-25
Less improvement required than Yorkshire Water	Affinity Water, Northumbrian Water, Portsmouth Water, SES Water, Severn Trent Water, South West Water, Thames Water	<34%
The same level of improvement required as Yorkshire Water	Anglian Water, Welsh Water, United Utilities, Wessex Water	=34%
Greater levels of improvement required than Yorkshire Water	Bristol Water, Hafren Dyfrdwy, Southern Water, South East Water, South Staffs Water	>34%

4.89 Our final methodology included a range of approaches companies could use to set performance commitment levels.[200] We also clearly stated that we expected performance to be stretching.[201] These elements of our methodology enabled companies to set challenging performance commitment levels that still took account of company specific circumstances. For example, the 'historical improvement' and 'expert knowledge' approaches enabled companies to analyse the impacts to service of any company specific circumstances and propose performance commitment levels on this basis. Furthermore, if stretching performance resulted in atypical costs, our methodology enabled companies to submit cost adjustment claims to ensure any costs to deliver the service levels were reflected in their allowances.[202]

4.90 The company did not provide any quantitative information to support its assertion that the number of upland sources and cast iron pipes made either its costs or achievable performance commitment levels atypical in any of the submissions noted above. In the absence of robust, quantitative information

[199] For companies with multiple performance commitments for water quality contacts we have selected the performance commitment with the greatest challenge for inclusion in this table.
[200] Ofwat, Delivering Water 2020: Our final methodology for the 2019 price review, December 2017, chapter 4.2.4, p.53
[201] Ofwat, Delivering Water 2020: Our final methodology for the 2019 price review, December 2017, chapter 4.2, pp. 45 (and throughout document)
[202] Ofwat, Delivering Water 2020: Our final methodology for the 2019 price review, December 2017, section 9.4.5, p.148

demonstrating the cause, service impact and uniqueness we therefore based our decisions on our detailed comparative assessments.

4.91 The company indicated that discolouration performance can be improved with reduced investment 'In AMP5, investment levels have been reduced, but performance has continued to improve. This performance improvement was due to targeting activity in the right areas of the network, along with addressing the risk of discolouration from trunk mains.'[203] Furthermore, we consider that our process for setting cost and service levels has provided the company with allowances to improve service. Our final determinations allowed the company £64 million to address raw water quality and taste and odour issues.[204]

Key issue – Outcome delivery incentive rates

4.92 The company states that our interventions on ODI rates are flawed because they move the company's rates arbitrarily closer to the industry average. It states that our interventions effectively replace the views of its customers. If argues that our approach of making incentive rates 'more similar' implies variation is down to measurement error and that this could have been addressed through undertaking a single set of cross-company research.[205]

4.93 We consider that that our interventions related to customer engagement were based upon prudent and appropriate challenge of the results of the company's customer research and the extent to which it has used it to form the business plan, based on the wider set of information available to Ofwat. We discuss this further in chapter 2 above and in 'Outcomes – common issues' chapter 5.

4.94 The company argues that we should have addressed any concern around significant variation in ODI rates across companies in our final methodology and that the fact that we did not do so 'seems consistent with its [our] view at the time being that variance would likely reflect genuine differences across companies.'[206] However, it is not the case that we assumed variation between companies would necessarily reflect genuine difference in customer's views. In fact we explicitly set out in our final methodology that we would compare

[203] Yorkshire Water, exhibit 066-096, Appendix 14a - Drinking Water Quality DWI Submission.pdf, chapter 4.6.2, p.53
[204] Ofwat, PR19 final determination models; section 7; enhancement feeder models; raw water deterioration; and taste, odour, colour, December 2019
[205] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp.58-59, paragraphs 177-181
[206] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 58, paragraph 180

companies' ODI rates at PR19 for the same performance commitment and challenge companies proposals where appropriate.[207]

4.95 The company further states that our approach on rates assessed their appropriateness based on: an arbitrarily defined reasonable range; that we intervened on the basis of PR14 rates despite a lack of comparability; and that our approach on rates is inconsistent concerning whether ODI rates around better levels of performance should be lower than those around worse levels of performance (reflecting diminishing marginal returns).

4.96 With respect to the company's point that our approach to assessing ODI rates is based on an arbitrarily defined reasonable range, we do not agree that our incorporation of wider sector information on ODI rates was arbitrary.

4.97 When we reviewed the ODI rates proposed by companies in their September 2018 business plans, we found substantial variation when comparing rates on a normalised basis. The extent of this variation in willingness to pay between households across companies' operating areas is neither explained by known factors which vary across companies, nor credible. Companies were similarly unable to provide an explanation for this variation.

4.98 We therefore attempted to reduce the influence of unexplained variations in survey results, and so better align ODI rates with actual customer preferences, by triangulating companies' proposed rates against other sources including industry average rates (and points in the distribution of rates around this) in the form of our 'reasonable ranges' (which are defined as ± 0.5 standard deviations around the normalised industry average rate).

4.99 While the reasonable ranges could be alternatively defined using other points in the distribution of rates we note that the definition of the range is not deterministic as we do not impose these ranges mechanistically. The reasonable range was just one of a series of cross-checks in assessing companies' proposed rates. Our actual interventions were based on a wider set of checks (including our assessment of the quality of a company's willingness to pay research and triangulation, comparisons against PR14 rates, past performance and the relative degree of stretch). Indeed, there were cases where companies' final determination rates remained outside our 'reasonable range'. We therefore do not agree with the company's assertion that our approach of applying reasonable ranges was arbitrary.

[207] Ofwat, Delivering Water 2020: Our final methodology for the 2019 price review, December 2017, Appendix 2, p. 90

4.100 With regard to the point about the PR14 rate, as we set out in our final determinations we performed a number of cross-checks as part of our assessment of companies' proposed ODI rates.[208] Our cross-check against equivalent ODI rates for the 2015-20 period was just one of seven tests that we applied to assess companies' rates. We consider this test provided a useful indication of whether a company was proposing a materially lower level of customer protection against incremental underperformance relative to the 2015-20 period. We did not assess the results of this test in isolation, in determining whether or how to intervene, and instead formed an in the round assessment based on the outcomes of the six other tests, and in particular whether they corroborated or allayed any concerns we identified. We therefore consider our approach made a targeted and proportionate use of the information revealed by companies' equivalent ODI rates for the 2015-20 period.

4.101 With respect to the company's claim that our approach to ODI rates was inconsistent with regards to the relative size of ODI rates around better versus worse levels of performance, we note that the company does not explain why it considers our approach to be inconsistent nor provides any examples of this alleged inconsistency.

Conclusion

4.102 Our final determinations decisions for Yorkshire Water reflected a detailed analysis of its outcomes package and submitted costs. The company is a poor performer in many key areas important to its customers and our decisions encouraged the company to deliver improvements to service for customers and the environment. Our decisions also ensured that the company's customers did not have to pay for the company to catch up with better performing companies.

4.103 Our analysis indicates that the company does not manage its assets in a cost-efficient way. Yorkshire Water has the worst comparative sewer collapses performance. The company has, on average, in the last 20 years, the joint lowest levels of sewer renewal and rehabilitation in the sector. The evidence suggests that the company's historical low rate of sewer replacement and rehabilitation has resulted in the highest rate of sewer collapses in the sector.

4.104 The company failed to provide robust evidence demonstrating that it is disproportionately impacted by the presence of cellars in its region. We

[208] Ofwat, PR19 final determinations: Delivering outcomes for customers policy appendix, December 2019, pp. 93-94

disagree that our final determination failed to recognise company-specific circumstances; our approach and methodology enabled companies to submit evidence for consideration relating to unique circumstances. We considered the quality of evidence provided in relation to internal sewer flooding was insufficient and unconvincing and did not robustly demonstrate that the company was atypical.

4.105 We disagree that our interventions on the outcomes package replaced the views of the company's customers. We consider that that our interventions related to customer engagement were based upon prudent and appropriate challenge of the results of the company's customer research and the extent to which it has used it to form the business plan, based on the wider set of information available to us.

4.106 We disagree that our leakage performance commitment levels were not based on sound evidence and that insufficient cost allowances were made in final determinations. Our policy direction with respect to leakage was in response to the future challenges faced by the industry and the limited progress made in driving down leakage levels over the past 15 years. We consider that our models provided an appropriate allowance for companies.

4.107 We do not agree that there was a disconnect between our approaches to mains repairs and leakage. The performance commitment levels on mains repairs were challenging for the company due to admitted underinvestment in the asset base in previous periods. We also consider that the company's strategy of large increases in mains repairs in order to reduce leakage is not in line with the rest of the sector.

4.108 We do not agree that our approach to assessing ODI rates was flawed or arbitrary. Our approach used a broad range of theoretically valid and practically implementable cross-checks to asses companies ODI rates and where required we made bespoke interventions for each company.

4.109 Our comparative assessments challenged Yorkshire Water to catch up with its peers in an area that the company identified is of high importance to its customers. As we explain in chapter 3 above, the company received an allowance of £51 million to address raw water quality and £13 million for address taste and odour issues in our final determinations.

5. Overall stretch across costs and outcomes

Summary

5.1 Our aim in the final determinations was to set a stretching but achievable level of overall challenge for the companies. If a final determination is too generous, a company will end up overfunded, and investors will enjoy high returns without appropriate incentives to deliver for customers. If the final determination is too harsh, a company may end up underfunded and investors may receive less than a fair return. In the final determination we considered the overall stretch on costs and outcomes individually and together, in the round.

5.2 Yorkshire Water and its consultants raise a number of issues on the overall stretch across costs and outcomes. These concerns are misplaced and appear to reflect Yorkshire Water's requirements for additional funding to catch up with the rest of the sector, rather than the genuine requirements for additional funding for an efficient company.

5.3 **Our overall level of stretch on costs and outcomes is achievable**. Our performance commitment levels reflect the stretch that has been achieved with base funding and take into account historical performance, cross company benchmarks and company forecasts. Our cost allowances take into account the requirements for performance improvements, in particular through enhancement funding, but also through additional funding for further improvements on leakage.

5.4 **Yorkshire Water's assessment of the level of stretch is misleading** – the overall level of stretch is the stretch on costs and outcomes – the reduction in the allowed return, equity risk and financial headroom do not represent changes in the level of challenge.

5.5 **Bill reductions do not reflect increased stretch**. Despite this the overall reduction in bills compared to company plans is similar to previous price controls.

5.6 **We are not attempting to reset historical outperformance.** Although we note Yorkshire Water's strong historical outperformance on totex and in PR14 Yorkshire Water received rewards for water supply interruptions, internal sewer flooding and pollution incidents (although it has more to do meet internal sewer flooding and pollution incidents performance commitments for 2024-25).

5.7 **Our stretch on outcomes is appropriate and achievable**. While Yorkshire Water's supply interruptions performance is strong, it is less strong on pollution incidents and internal sewer flooding. We do not consider that customers should suffer because a company has fallen behind the rest of industry and this should impact on the performance commitment levels set for Yorkshire Water.

5.8 **Companies can achieve both cost efficiency and good outcome performance**. The potential impact on costs should not be used as a cover for companies achieving a lower level of service quality than their peers. Some efficient companies are also upper quartile for performance commitments, and some of them have even already met their 2024-25 performance commitment levels. We do not expect companies to be upper quartile on all outcomes, as we are not expecting a company to be good at everything. We would, however, expect an efficient company, on average, to have net zero outcome delivery incentive payments.

5.9 **Our frontier shift does not double count efficiency gains**. Productivity analysis does not properly adjust for changes in quality. A number of companies have already met the 2024-25 performance commitments. We therefore do not consider that there is double counting of quality improvements.

5.10 **The stretch on many companies that accepted the determinations is greater than the disputing companies**. It seems reasonable to assume that those companies that accepted the determinations considered that the overall level of stretch was achievable and they could meet their performance commitments within the funding allowed.

5.11 Table 5.1 highlights the key issues raised by Yorkshire Water in its submission relating to the overall stretch across costs and outcomes and a summary of our response. We also discuss these issues in more detail in 'Introduction and overall stretch'.

Table 5.1: Key issues on the overall stretch across costs and outcomes raised by Yorkshire Water in its submission

Key issue in Yorkshire Water's submission	Summary of our response
Yorkshire Water states that we have increased the level of stretch	**Yorkshire Water's assessment of the level of stretch is misleading** – the reduction in the allowed return reflects market conditions and not increased stretch and neither does the change in financial headroom. Yorkshire Water's assumptions on the change in the balance of risk are not credible for an efficient company. The overall level of stretch on costs and outcomes in PR19 is similar to PR14,

Key issue in Yorkshire Water's submission	Summary of our response
compared to PR14, and it is greater than in the energy controls.[209]	with the key difference being that we have 'baked in' the performance improvements we expect companies to make in the price control.
Yorkshire Water states that, based on analysis by Economic Insight, the reduction in bills as part of PR19 increases the level of stretch, particularly when considered relative to the additional stretch on outcomes.[210] [211]	**Bill reductions do not reflect increased stretch.** Economic Insight compares bills in company business plans and our final determinations. This will therefore reflect whether the company submitted a challenging business plan rather than the level of stretch. Nevertheless the overall reduction in bills across the sector from PR19 is similar to previous price controls.[212] Our stretch on outcomes is similar to that which has been achieved in PR14.
Economic Insight[213] (on behalf of Northumbrian Water, Yorkshire Water and Anglian Water) suggests that there is not a case for a step change in performance as there has not been historical outperformance of price controls.	**We are not attempting to reset historical outperformance.** Our proposal for a step change is not based on whether there has been systematic outperformance of previous price controls. Rather it is based on stagnating performance on cost efficiency and outcome performance over recent years, the significant improvements made and proposed by some companies, the facilitating changes in the PR19 framework and our view that the sector can do much more to improve performance. Nonetheless, historical performance is informative in particular on how companies respond to the challenges that we set. We note that Yorkshire Water has outperformed (underspent) its totex allowances in the last four price control periods by an average of 5%.
Economic Insight (on behalf of Northumbrian Water, Yorkshire Water and Anglian Water) suggests that outcomes reflect a step change in the challenge for PR19, compared to PR14.[214]	**Our stretch on outcomes is appropriate and achievable.** Yorkshire Water made limited improvement on some common upper quartile performance commitments relative the industry average improvement during PR14. We do not consider that customers should suffer because a company has fallen behind the rest of industry. On water supply interruptions Yorkshire Water is

[209] Yorkshire Water, 'Overview of the reasons why we have rejected the Final Determination', April 2020, slide 21.
[210] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, April 2020, p. 17-18, paragraph 55.
[211] Yorkshire Water's Annex 06, Economic Insight, 'Top-Down Analysis of the Financeability of the Notionally Efficient Firm – A follow on report for Anglian Water, Northumbrian Water, and Yorkshire Water', March 2020, p. 4.
[212] Ofwat, 'Reference of the PR19 final determinations: Introduction, overall stretch on costs and outcomes – response to cross-cutting issues in companies' statements of case', May 2020, Chapter 6, Table 6.3; and Ofwat, 'PR19 final determinations: Securing cost efficiency technical appendix', December 2019, p. 186, Table A3.6.
[213] Yorkshire Water's Annex 06, Economic Insight, 'Top-down analysis of the financeability of the notionally efficient firm - A follow on report for Anglian Water, Northumbrian Water, and Yorkshire Water', March 2020, p. 9 and Chapter 4.
[214] Yorkshire Water's Annex 06, Economic Insight, 'Top-Down Analysis of the Financeability of the Notionally Efficient Firm - A follow on report for Anglian Water, Northumbrian Water, and Yorkshire Water', March 2020, p. 9 and Chapter 4.

Key issue in Yorkshire Water's submission	Summary of our response
	forecast to outperform its 2024-25 target in 2019-20, evidence that the level of stretch we are imposing in PR19 is achievable.
Yorkshire Water suggests that the reduction in the allowed return on equity, an increase in the equity at risk and a reduction in interest cover ratios all reflect an increase in the level of stretch.[215]	**Our allowed return on equity is based on market evidence.** The reduction in the allowed return reflects prevailing market evidence. If we were to follow what the disputing companies are suggesting, it would mean that we should add a premium to the allowed return to offset the increased level of stretch. It would be wrong to ask customers to pay more because disputing companies claim to be unable to meet the level of stretch faced by the rest of the sector.
Yorkshire Water states that the step change is beyond what an efficient firm could be expected to achieve.[216] Yorkshire Water states that there was a disconnect between costs and service in the final determination and that it requires additional funding to meet certain service commitments. Yorkshire Water states that there is no correlation between cost efficiency and leakage and pollution and that the correlation is weak for internal sewer flooding. It states the correlation is strong for water supply interruptions. The company argues that, for internal sewer flooding, the correlation could have been improved if the large numbers of cellars in the company's region had been taken into account. Yorkshire Water also states that further investigation into regional and other factors is needed to explain the cost efficiency-service quality relationship for certain companies.	**Companies can achieve both cost efficiency and good outcome performance.** Yorkshire Water does not provide any evidence for its conclusions on the link between individual service quality metrics and cost efficiency. We have separately examined the cost efficiency and service quality performance across each of water, wastewater and retail. At a company level, we do not find an inverse relationship between cost efficiency and service quality, and there is evidence of a continued positive relationship between cost efficiency and service quality. The potential impact on costs should not be used as a cover for companies achieving a lower level of service quality than their peers. We use common performance commitments which we used in PR14 to set upper quartile levels. We consider that these metrics are sufficiently comparable across companies for the analysis to be valid.
Yorkshire Water, based on analysis by Economic Insight, states that the benchmark companies for wastewater (Northumbrian Water) and water (South West Water) have not achieved upper quartile performance on pollution incidents/internal sewer flooding and water supply interruptions.[217]	**Some companies are efficient and perform well on outcomes.** Some efficient companies on both water and wastewater are also upper quartile for performance commitments, and some of them have even already met their 2024-25 performance commitment levels. We do not expect companies to be upper quartile on all outcomes, as we are not expecting a company to be good at everything. We recognise that even an efficient company may be good in some areas and less good in others. We

[215] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp. 22-23, paragraphs 70-73.
[216] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp. 42-44, paragraphs 127, 130-134.
[217] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp. 47-48, paragraph 143.

Key issue in Yorkshire Water's submission	Summary of our response
	would, however, expect an efficient company, on average, to have net zero outcome delivery incentive payments. Overall, the data indicates that it is possible for a company to have both upper quartile outcome performance and upper quartile cost efficiency at the same time.
Yorkshire Water[218] and Economic Insight[219] (on behalf of Yorkshire Water) claim that our approach was flawed because we reached a view that some performance commitments, including the forecast upper quartile and 15% leakage reduction, could be met before we knew what the level was or what the costs were.	**This misunderstands the approach that we have taken to cost allowances for the forecast upper quartile performance commitments and leakage.** The upper quartile performance commitments are based on historical performance. The leakage improvement is based on the advances in technology over the last 20 years, which do not appear to have impacted on the overall level of leakage. In our methodology we were clear that we were not expecting to provide additional funding for either.
Yorkshire Water states that assuming companies can still invest productivity gains in improved performance while achieving a 1.1% per year frontier shift double counts efficiency gains.[220]	**Our frontier shift does not double count efficiency gains**. Productivity analysis does not properly adjust for changes in quality. A number of companies have already met the 2024-25 performance commitments. We therefore do not consider that there is double counting of quality improvements.
Yorkshire Water states that some companies' acceptance of the final determinations is not relevant.[221]	**The stretch on many companies that accepted the determinations is greater than the disputing companies.** It is clear that the stretch for the disputing companies was lower than it was for many companies that accepted the final determination (see chapter 7 of 'Introduction and overall stretch document'). These companies accepted the determinations in the round, and so it seems reasonable to assume that those companies that accepted the determinations considered that the overall level of stretch was achievable and they could meet their performance commitments within the funding allowed.

Considerations for the CMA

5.12 **Our level of stretch on costs for Yorkshire Water is achievable**. It is clear that the cost stretch for the disputing companies is lower than it is for many companies that accepted the final determination. The level of stretch we are imposing on

[218] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 46, paragraph 141a.
[219] Yorkshire Water's Annex 06, Economic Insight 'Ofwat's Approach to Funding Upper Quartile Performance – A report for Yorkshire Water', March 2020, p. 2.
[220] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp. 46-47, paragraph 140(c).
[221] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 48, paragraph 145.

Yorkshire Water's base costs (2.9%) is less than the sector average (3%).[222] A number of companies proposed larger reductions in base costs in their business plans.

5.13 **Our level of stretch on outcomes for Yorkshire Water is achievable and necessary**. Yorkshire Water is forecasting it will outperform our 2024-25 performance commitment level on water supply interruptions in 2019-20. In our final determination Yorkshire Water had considerable stretch on its performance commitments for both internal sewer flooding and pollution incidents compared to its current performance. However, our analysis of the PR14 industry improvement suggests that Yorkshire Water had some of the smallest improvements over PR14 on both of these performance commitments. We do not consider that customers should suffer because a company has fallen behind the rest of industry. As such, we consider it is appropriate to hold Yorkshire Water to the same performance commitment levels on internal sewer flooding and pollution incidents as the rest of the industry.

5.14 **It is possible for companies to be upper quartile on costs and outcomes:** We respond to the argument made by Yorkshire Water contending that the cost benchmark company has not historically achieved the target performance on some upper quartile common performance commitments. Our analysis shows that it is possible for a company to have both upper quartile outcome performance and upper quartile cost efficiency at the same time. We do not expect companies to be upper quartile on all outcomes, but we would expect an efficient company, on average, to have net zero outcome delivery incentive payments.

5.15 We consider our final determination provided sufficient funding such that Yorkshire Water's allowances balance the needs of customers and investors.

Our response to key issues raised by Yorkshire Water

Key issue: The level of stretch in our final determination

5.16 Yorkshire Water states that we increased the level of stretch compared to PR14, and that it is greater than that in energy price controls.[223] Yorkshire Water bases its assessment of the overall level of stretch on totex per customer

[222] Ofwat, Table 5.3, 'Overall level of stretch on costs and outcomes and cross cutting issues', May 2020.
[223] Yorkshire Water's initial presentation to the CMA, April 2020, slide 21

(excluding WINEP), upper quartile performance commitments, asset health performance commitments, allowed equity return, equity at risk (effective the balance of risk) and financial headroom which it measures using adjusted cash interest cover ratio. **Yorkshire Water's assessment of the overall level of stretch is misleading.**

5.17 **The reduction in the allowed return reflects market evidence and does not increase or reduce the overall level of stretch**. In theory the allowed return could increase or reduce the overall level of stretch if a regulator "aims off" and adjusts the allowed return to reflect expected performance or asymmetric information and not just reflecting market evidence. In the final determinations we set the allowed return on capital consistent with market evidence. We therefore do not increase or weaken the level of stretch we require of companies due to our allowed return. We note that independent reviews[224] and other regulators[225] have considered that it is appropriate to discount the allowed return to take account of asymmetric information and expected outperformance. We have not done so in the PR19 final determinations, but believe the CMA should consider this issue as part of its redetermination.

5.18 Additionally if the balance of risk and return across costs and outcomes was skewed to the upside or downside – for example if the stretch was too great or too little – and this risk was not diversifiable, then this could in theory increase or reduce the required allowed return on capital. We do not consider that Yorkshire Water's forecast 70% increase in the level of stretch for an efficient company to be credible. However we do consider that our overall package is stretching and achievable, and the expected outturn for an efficient company should be our allowed return on capital. We therefore do not consider that it was necessary or appropriate to adjust the allowed return to reflect the level of stretch on outcomes and cost efficiency.

5.19 We do not consider that the changes in the PR19 adjusted interest cover ratio increased the level of stretch. As we set out at length in 'Risk and return – common issues' chapter 4, Yorkshire Water and the other disputing companies were financeable. The financial ratios we used already incorporated sufficient headroom for financeabilty reasons. It was not the role of the final determinations to increase headroom on a notional basis beyond that required for financeability reasons. Customers should not pay extra for companies who adopt highly geared structures and/or have past performance failures.

[224] National Infrastructure Commission, 'Strategic Investment and Public Confidence', October 2019, pp. 15-16.
[225] Ofgem, 'RIIO-2 Sector Specific Methodology Annex: Finance', December 2018, p. 52, paragraph 3.162.

5.20 Yorkshire Water's use of totex excluding WINEP is misleading. While a comparison of the change in base totex is potentially informative (and is set out in the next chapter) overall totex includes a wide range of enhancement expenditure including supply demand balance and resilience and is not limited to WINEP where Yorkshire Water has one of the largest programmes in relative scale for PR19. In terms of total expenditure our final determinations gave Yorkshire Water around 10% more than historical expenditure.[226]

5.21 The overall level of stretch on costs and outcomes in PR19 is similar to PR14, with the key difference being that we have 'baked in' the performance improvements we expect companies to make in the price control. Our stretch on outcomes is similar to that which has been achieved in PR14. Further details are set out in chapter 4 of 'Introduction and overall stretch'.

Key issue: The reduction in bills and the overall stretch

5.22 Yorkshire Water states that we increased the level of challenge significantly in particular as the difference in bills between the final determinations and Yorkshire Water's business plan was 3.7 times greater than the average level of challenge over the PR04-PR14 price controls. Yorkshire Water states that this understates the level of challenge as the improvement required in pollution incidents is 2.7 greater than at PR14.[227] [228]

5.23 **Examining bill movements between company plans and our final determinations as an indicator in the level of stretch is misleading.** As set out in chapter 3 of 'Introduction and overall stretch',[229] bills – or more properly total revenues as we set revenues and not price controls – are a function of the decisions that we take on expenditure, allowed return and the amount of money recovered in period and over time. Bills are therefore a product of the other decisions and not an end in themselves. The comparison that Economic Insight provides is between bills in company business plans and our final determinations. This will therefore reflect whether the company submitted a challenging business plan.

[226] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 10.
[227] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p.44, paragraph 133
[228] Yorkshire Water's Annex 06, Economic Insight, 'Top-down analysis of the financeability of the notionally efficient firm – A follow on report for Anglian Water; Northumbrian Water; and Yorkshire Water', March 2020, pp. 24-25.
[229] Ofwat, 'Reference of the PR19 final determinations: Introduction, overall stretch on costs and outcomes – response to cross-cutting issues in companies' statements of case', May 2020, Chapter 3.

Company business plan expenditure requests can be significantly higher than outturn expenditure, as shown in figures 2.1 and 2.2 in the 'Cost efficiency – common issues' document.[230] Companies can also request a much higher allowed return on capital than required. For example most companies used our early view of the allowed return in their business plan but did not follow the reductions we made to reflect market conditions.

5.24 As we show in table 6.3 in the 'Introduction and overall stretch' document,[231] compared to company business plans the bill movement in PR19 was similar to the bill movement in previous price reviews. **And so even if the comparison was valid, which we dispute, PR19 is no more stretching than previous price reviews.** For around half the companies the bill movement in PR19 is lower than the average for previous price controls. The largest part of the bill movement in PR19 compared to company plans stems from the reduction in the allowed return on capital rather than any interventions on cost efficiency or levels of investment. We note that the bill reductions for Yorkshire Water are towards the lower end of the bill reductions for PR19.

5.25 We consider that Yorkshire Water's analysis of the additional stretch on performance is misleading as it masks the underlying improvement required as it is expressed in relative terms rather than in percentages. While Yorkshire Water's pollution incident requirements are more stretching than it has achieved in PR14, this reflects Yorkshire Water's lack of improvement in PR14 rather than a significant increase in stretch.

Key issue: Historical returns

5.26 Economic Insight[232] (on behalf of Northumbrian Water, Yorkshire Water and Anglian Water) states that the overall level of stretch across costs, outcomes and the allowed return is not consistent with our duties as there has not been historical outperformance of price controls. Within this it makes a number of further statements which we respond to in turn below.

[230] Ofwat, 'Reference of the PR19 final determinations: Cost efficiency - response to common issues in companies' statements of case', May 2020, Chapter 2, Figures 2.1 and 2.2.
[231] Ofwat, 'Reference of the PR19 final determinations: Introduction, overall stretch on costs and outcomes – response to cross-cutting issues in companies' statements of case', May 2020, Chapter 6, Table 6.3.
[232] Yorkshire Water's Annex 06, Economic Insight, 'Top-down analysis of the financeability of the notionally efficient firm – A follow on report for Anglian Water; Northumbrian Water; and Yorkshire Water', March 2020, p. 11.

5.27 Economic Insight calculates return on capital employed (RoCE) and uses this analysis to state there has not been historical outperformance for PR14, or for previous price control periods.[233] [234]

5.28 Our proposal for a step change was not based on whether there has been systematic outperformance of previous price controls. Rather it was based on stagnating performance on cost efficiency and outcome performance over recent years, the significant improvements made by some companies and our consideration that the sector can do much more to improve performance. Nonetheless, historical performance is informative in particular on how companies respond to the challenges that we set.

5.29 **Return on regulatory equity (RoRE) is the most appropriate measure to assess outperformance under a totex regime.** Since 2014, we have used RoRE to measure the return to equity shareholders. This is consistent with the premise of a notional capital structure, with outperformance and underperformance being shareholder issues. It is also a more reliable and readily understood measure to calibrate and monitor performance. The RoCE approach used by Economic Insight is influenced by the different accounting policies adopted by each company. We note that Ofgem also reports performance on a RoRE basis. Under a totex approach, measurement of out- and underperformance on a RoRE basis allows for comparisons across companies on a more consistent basis. As a consequence, RoRE is a more consistent and readily understood measure to calibrate our determinations and monitor company performance. We are not aware of Yorkshire Water objecting to the principle of focusing on RoRE in its annual performance reports or our annual monitoring reports.

5.30 **Over 2015-19, companies have generally outperformed their base return**. Under the notional capital structure, eleven companies have outperformed their base return allowance. Under their actual capital structure thirteen companies have outperformed their base return, with Anglian Water, Northumbrian Water and Yorkshire Water having a total shareholder return in excess of 10%.

5.31 Under a notional capital structure, thirteen companies have reported outperformance against the financing measures and ten companies on the operational measures. Overall, companies have tended to outperform on

[233] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p.44, paragraph 133
[234] Yorkshire Water's Annex 06, Economic Insight, 'Top-down analysis of the financeability of the notionally efficient firm – A follow on report for Anglian Water; Northumbrian Water; and Yorkshire Water', March 2020, Chapter 2.

operational measures, with ten companies outperforming on totex and ten outperforming on outcome delivery incentives.

5.32 **Over the last four price controls companies, including Yorkshire Water, have on average outperformed (underspent) against their expenditure allowances.** Yorkshire Water has outperformed its totex allowance in all price control periods since 2000, with average outperformance of 5.3%. In one price control period (2000 to 2005) Yorkshire Water outperformed its totex allowance by more than 10%. We show further detail in table 6.1 of 'Introduction and overall stretch'.[235]

5.33 While overall net payments for outcome delivery incentives in PR14 across the sector are broadly neutral, this masks big differences across companies and individual performance commitments. For the three upper quartile common performance commitments, companies have generally outperformed, as shown in table 6.2 in 'Introduction and overall stretch'.[236] This is particularly so for the three of the disputing companies: Anglian Water, Northumbrian Water and Yorkshire Water.

Key issue - High quality service and related costs

5.34 Yorkshire Water states that there was a disconnect between costs and service in the final determination and that it requires additional funding to meet certain service commitments, in particular the three upper quartile performance commitments: water supply interruptions, internal sewer flooding and pollution incidents and the 15% reduction in leakage.[237]

5.35 The issues raised by Yorkshire Water cover a broad range of areas, which we have grouped into the following areas.

- backwards looking assessment of outcomes stretch – this is discussed in chapters 9 and 10 of our 'Outcomes – common issues' document;
- including service quality and leakage performance in cost modelling – this is discussed in chapter 5 of 'Cost efficiency - common issues';
- company level assessment of outcomes and cost performance;

[235] Ofwat, ''Reference of the PR19 final determinations: Introduction, overall stretch on costs and outcomes – response to cross-cutting issues in companies' statements of case', May 2020, Chapter 6, Table 6.1.
[236] Ofwat, ''Reference of the PR19 final determinations: Introduction, overall stretch on costs and outcomes – response to cross-cutting issues in companies' statements of case', May 2020, Chapter 6, Table 6.2.
[237] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp.22,46-50, paragraphs 69 and 139-151

- performance of cost benchmark companies;
- link between cost allowances and service quality;
- link between productivity gains and service quality; and
- acceptance of final determinations.

5.36 We note that Yorkshire Water provided the most extensive response of all disputing companies in this area, despite the company stating in response to the draft determinations that '[i]n the spirit of compromise with Ofwat, we are willing to tolerate the absence of the costs that we believe are necessary from our final determination. Accordingly, we have removed £300m of enhancement expenditure for upper quartile service from our tables'.[238] If it could meet these performance commitments without this additional funding in response to the draft determinations, it seems odd that it cannot do so now.

Key issue: Company level assessment of outcomes and cost performance

5.37 At final determination, we compared the historical cost and outcomes data to analyse the relationship between cost efficiency and service quality performance. We plotted our estimates of cost efficiency against service quality rankings of companies. The data did not suggest that there is an inverse relationship between historical cost efficiency and good outcome performance. Rather at a company level the data suggested that better outcomes could be associated with lower costs. We stated that this could have reflected better managed companies performing well on both costs and outcomes. For example, both Portsmouth Water and Wessex Water demonstrated that they were able to deliver high quality and high efficiency at the same time.

5.38 Yorkshire Water challenged our conclusion that 'there is a positive correlation between our estimates of historical cost efficiency and outcome performance.' It states that there is no such correlation for leakage and pollution and that the correlation is weak for internal sewer flooding. It states the correlation is strong for water supply interruptions. The company argues that, for internal sewer flooding, the correlation could have been improved if the large numbers of cellars in the company's region had been taken into account.[239]

5.39 Yorkshire Water does not provide any evidence for its conclusions on the link between individual service quality metrics and cost efficiency. We have separately examined the cost efficiency and service quality performance across

[238] Yorkshire Water, 'Cost efficiency – Yorkshire Water Draft Determination Representation', August 2019, p. 63.
[239] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p.22, paragraph 69

each of water, wastewater and retail. At a company level the analysis shows a positive correlation between cost efficiency and service quality. And contrary to what some companies including Yorkshire Water have suggested, we do not observe an inverse relationship between service quality and cost efficiency. We therefore continue to consider that 'better outcome performance should not necessarily increase cost'. We acknowledge that improving outcome performance could impose costs on companies. Nevertheless, some companies have managed to achieve both high service quality and cost efficiency. Indeed, a number of companies are delivering better service quality and lower costs than Yorkshire Water. In summary, the potential impact on costs should not be used as a cover for companies such as Yorkshire Water achieving a lower level of service quality than their peers.

5.40 It should be emphasised that this is for our overall assessment of stretch across costs and outcomes. We used a wide range of analysis to make sure that cost and service proposals were appropriate including historical evidence of cost and service performance, company forecasts and cross company benchmarks.[240]

5.41 Yorkshire Water also states that further investigation into regional and other factors is needed to explain the cost efficiency-service quality relationship for certain companies.[241]

5.42 In our analysis in chapter 7 of the 'Introduction and overall stretch' document,[242] we only focus on common performance commitments which we used in PR14 to set upper quartile levels. We consider that these metrics are sufficiently comparable across companies for the analysis to be valid.

Key issue: Performance of the cost benchmark company

5.43 Yorkshire Water, based on analysis by Economic Insight, states that the benchmark companies for wastewater (Northumbrian Water) and water (South West Water) have not achieved upper quartile performance on pollution incidents/internal sewer flooding and water supply interruptions.[243] Yorkshire

[240] Ofwat, 'PR19 final determinations: Overall stretch on costs, outcomes and cost of capital policy appendix', December 2019.
[241] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 22, paragraph 69
[242] Ofwat, 'Reference of the PR19 final determinations: Introduction, overall stretch on costs and outcomes – response to cross-cutting issues in companies' statements of case', May 2020, Chapter 8.
[243] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp. 47-48, paragraph 143.

Water therefore concludes that if the benchmark company cannot reach these performance levels then Yorkshire Water also cannot meet these levels within its base cost allowances.

5.44 Yorkshire Water states that even if an efficient company could achieve the forecast upper quartile for one of the measures, it is unlikely to be able to achieve the forecast upper quartile for multiple performance commitments because performance trade-offs will need to be made.[244]

5.45 Unlike Economic Insight and Yorkshire Water, we consider it is important to take into account each of the companies that perform well on costs, and are above or at our benchmark, rather than simply focusing on the benchmark company. Our analysis shows that some companies are upper quartile on cost efficiency and outcome performance (see tables 7.2 and 7.3 in 'Introduction and overall stretch'[245]).

5.46 For wholesale water it can be seen that two companies (Portsmouth Water and South Staffs Water) that are above or at our efficient cost benchmark (defined as the fourth company for wholesale water) are also upper quartile for supply interruptions (with Yorkshire Water in fifth position) and both companies have already met the PR19 2024-25 performance commitment level (and Yorkshire Water is forecasting to in 2019-20).[246] We consider that this demonstrates that it is possible to meet our cost benchmark and meet the water supply interruptions 2024-25 performance commitment level.

5.47 For wholesale wastewater the picture is even clearer. For wastewater the efficient cost benchmark was defined as the third company (Northumbrian Water) and so covers Severn Trent Water, Wessex Water and Northumbrian Water. As shown in table 7.3 in 'Introduction and overall stretch', all three efficient companies perform well on service quality. Wessex Water has been upper quartile for both internal sewer flooding and pollution incidents, and has already met the 2024-25 performance commitment level for internal sewer flooding. Northumbrian Water has met the 2024-25 performance commitment level for pollution incidents.[247] And even Severn Trent Water is the fourth ranked company on both internal sewer flooding and pollution incidents (the

[244] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 52, paragraph 159c.
[245] Ofwat, 'Reference of the PR19 final determinations: Introduction, overall stretch on costs and outcomes – response to cross-cutting issues in companies' statements of case', May 2020, Chapter 7, Tables 7.2 and 7.3.
[246] The upper quartile for water is defined as between the fourth and fifth company.
[247] Note that Northumbrian Water's rank of 7 on pollution incidents is due to its particularly poor performance in 2015, in which it had 97 pollution incidents per 10,000 km of sewer.

upper quartile is defined as between the third and fourth company for wastewater).

5.48 We did not expect companies to be upper quartile on all outcomes, as we were not expecting a company to be good at everything. We recognised that even an efficient company may be good in some areas and less good in others. We would, however, expect an efficient company, on average, to have net zero outcome delivery incentive payments. **Overall, the data indicates that it is possible for a company to have both upper quartile outcome performance and upper quartile cost efficiency at the same time.**[248]

5.49 We consider that Economic Insight's analysis is misleading as it averages absolute performance over time and compares this with the PR19 performance commitment level where performance improved on the upper quartile based metrics at the start of the PR14 period (although it has tended to stagnate since then). We consider it is important to consider whether efficient companies have managed to perform well on service quality (eg within the upper quartile) in more recent years.

Key issue: Link between cost allowances and service quality

5.50 Yorkshire Water[249] and Economic Insight[250] (on behalf of Yorkshire Water) claim that our approach was flawed because we reached a view that some performance commitments, including the forecast upper quartile and 15% leakage reduction, could be met before we knew what the level was or what the costs were.

5.51 This reflects a misunderstanding of the approach that we have taken to cost allowances for the forecast upper quartile performance commitments and leakage.

5.52 Our stretch on the forecast upper quartile was set so that it was achievable from base cost allowances, consistent with the statement that we made in the in our PR19 methodology we stated that '[a]verage performance now will not

[248] Ofwat, 'Reference of the PR19 final determinations: Cross-cutting issues', March 2020, paragraph 3.53.
[249] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 46, paragraph 141a.
[250] Yorkshire Water's Annex 04, Economic Insight 'Ofwat's Approach to Funding Upper Quartile Performance – A report for Yorkshire Water', March 2020, p. 2.

equate to efficient performance in the future' and we are not expecting to provide companies with additional funding to meet this challenge.

5.53 In our final determinations we used company forecasts of the forward-looking upper quartile, evidence of historical improvements and benchmarking across companies to set stretching performance commitment levels. In PR14 we did not provide additional funding to achieve historical upper quartile performance commitments. Most companies achieved their PR14 upper quartile common performance commitments as well as outperforming on their upper quartile-based cost allowances.

5.54 Based on historical performance we expected some improvement in quality over time without increasing cost. We allowed enhancement costs where there was good evidence that further improvements in service require an efficient company to incur higher costs.

5.55 As set out above, to the extent that historical improvements in outcomes required net additional costs, these costs were included in our cost models and are reflected in our allowances to allow similar improvements in the future. For water supply interruptions, pollution incidents and internal sewer flooding, we carefully considered the level of stretch implied by the forward-looking data, taking account of historical improvement. For water supply interruptions, we reduced the stretch in the final determinations to take account of the historical evidence and companies' evidence. For pollution incidents and internal sewer flooding, we confirmed that the pace of improvement in the historical period was consistent with forward looking estimate. Further detail is provided in chapter 2 of 'Outcomes – common issues'.[251]

5.56 We discuss the link between leakage and cost performance below.

Key issue: Link between productivity gains and service quality

5.57 Yorkshire Water states that assuming companies can still invest productivity gains in improved performance while achieving a 1.1% per year frontier shift double counts efficiency gains.[252]

[251] Ofwat, 'Reference of the PR19 final determinations: Outcomes - response to common issues in companies' statements of case', May 2020, Chapter 9 and 10.
[252] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p.46 and 48, paragraphs140 (c) and 144.

5.58 As we set out in our final determination, in theory productivity analysis partly takes into account changes in the quality of outputs.[253] This is through the use of quality adjusted price deflators, which take into account quality when calculating whether the price of goods have increased over time. However **productivity in practise, as illustrated by Frontier Economics' analysis of water sector productivity, does not properly adjust for changes in quality**.[254] [255]

5.59 In addition it is not clear that our quality improvements represented frontier shift. For example on water supply interruptions, pollution incidents and internal sewer flooding, a number of companies have, are, or are forecast to be by 2019-20, performing better than their 2024-25 performance commitment level. For leakage we provided funding for companies going beyond the forecast upper quartile. **The stretch in ongoing outcomes performance therefore reflected catch-up challenge rather than frontier shift**. We therefore do not consider that there is double counting of quality improvements. We note that company concerns focus on only four out of an average of 40 performance commitments per company.

5.60 We accept that the 15% reduction in leakage was likely to be an additional challenge to companies, particularly if they are currently performing well, and took this into account in setting our frontier shift. We therefore provided £111 million of additional enhancement funding to reduce leakage for companies that are performing well and are beyond the forecast upper quartile.[256]

5.61 Advancements in technology over the past 20 years suggest that poorer performing companies should have achieved even better performance on leakage. These advancements allow companies to identify leaks quicker and reduce response times, thereby allowing companies to reduce leakage. We consider that taking advantage of these advances should allow water companies to reduce leakage efficiently.

[253] Ofwat, 'PR19 final determinations: Overall stretch on costs, outcomes and cost of capital policy appendix', December 2019, p. 44.
[254] International Monetary Fund, 'Producer Price Index Manual: Theory and Practice, International Monetary Fund', September 2004.
[255] Lichtenberg, F.R. and Griliches, Z., 1989. Errors of measurement in output deflators. Journal of Business & Economic Statistics, 7(1), provided as S001, pp.1-9.
[256] Leakage performance targets have historically been set in reference to the sustainable economic level of leakage (SELL) and we provide further comment on this and our enhancement allowances for leakage reduction in Ofwat, 'Reference of the PR19 final determinations: Cost efficiency - response to common issues in companies' statements of case', Section 5.

Key issue: Acceptance of final determinations

5.62 Yorkshire Water states that some companies' acceptance of the final determinations is not relevant as:[257]

- they accepted the final determination in the round and may still not meet the 2024-25 performance commitment levels;
- there may be regional, operational and financial differences between companies which mean the 2024-25 performance commitment levels can be achieved without funding for some but not others; and
- companies may decide to divert resources from elsewhere to meet the 2024-25 performance commitment levels.

5.63 Thirteen companies did not dispute the final determinations while four companies did. It is clear that the stretch for the disputing companies is lower than it is for a number of companies that accepted the final determinations (see chapter 7 of 'Introduction and overall stretch' document). These companies accepted the determinations in the round, and so it seems reasonable to assume that those companies that accepted the determinations considered that the overall level of stretch was achievable and they could meet their performance commitments within the funding allowed. The stretch that Yorkshire Water and the other disputing companies seem to be principally concerned about is around the upper quartile common performance commitments, where common levels have been set since PR14. The disputing companies have not provided evidence why these commitments are more difficult for them than other companies. We therefore consider that these commitments should be achievable for the disputing companies without additional funding.

Conclusion

5.64 Yorkshire Water and its consultants raise a number of points in relation to the overall level of stretch on costs and outcomes in our final determination. These concerns are misplaced and in general reflect Yorkshire Water's requirements for additional funding to catch up with the rest of the sector, rather than the genuine requirements for additional funding for an efficient company. We consistently find evidence that companies can achieve both cost efficiency and good outcome performance. We do not consider that the impact on cost

[257] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 48, paragraph 145.

efficiency should be used as an excuse for poorer performing companies not to perform at the same level as their peers.

5.65 We note that Yorkshire Water – a relatively poor performer – states it needs more money than other companies to make the improvements needed to meet its PR19 performance levels whilst another of the disputing companies, Anglian Water, says it needs more money than other companies because it is a high performer. Both companies state that they require higher costs because their performance varies from that of the benchmark performance company. It is worth considering if either position, in the light of the particular facts for each company, means that customers should pay more than our benchmark efficient costs.

6. Aligning risk and return

Summary

6.1 The final determination set an allowed return of 2.96% (CPIH) which we consider provided a reasonable return for an efficient company based on the available market evidence at the time.

6.2 **We are satisfied that our final determination for Yorkshire Water provided an appropriate balance of risk and return**, with significant scope to earn upside from outperformance with slight upward skew to its risk range.

6.3 **We consider that Yorkshire Water's determination is financeable**. We advanced revenue of £85 million from future periods through pay as you go (PAYG) adjustments. Following the revenue advancement, we assessed the financial ratios in Yorkshire Water's final determination to be consistent with a credit rating two notches above the investment grade. Consistent with the PR19 methodology and our approach at previous price reviews, our financeability assessment was on the basis of the notional capital structure and before taking account of reconciliation adjustments for past performance.

6.4 **Yorkshire Water is a highly geared company**. It reported gearing of 75.8% as at 31 March 2019. Moody's has recently downgraded Yorkshire Water's senior secured debt to Baa2 from Baa1, estimating gearing of over 130% taking into account the fair value of existing borrowings as well as derivatives.[258] Yorkshire Water is responsible maintaining its financial resilience under its actual financial structure. Our final determination set out we will closely monitor the steps Yorkshire Water takes so that financial resilience is being maintained in 2020-25.

6.5 Table 6.1 highlights the key issues raised by Yorkshire Water in its submission in relation to risk and return and a summary of our response to each of those points.

[258] Moody's Investor Services, 'Moody's downgrades Yorkshire Water's Class A notes to Baa2 and changes outlook to negative', March 2020. The rating action states the rationale for downgrade of the Class A notes as reflecting 'the persistently high and growing mark-to-market loss (MTM) on Yorkshire Water's derivative portfolio, which was around GBP2.6 billion (37% of Regulatory Capital Value) as of January 2020.' and goes on to state 'Yorkshire Water's MTM is largely associated with RPI-linked swaps dating from the company's acquisition in 2008, many of which extend to the mid-2040s or beyond.'

Table 6.1: Key issues on risk and return raised by Yorkshire Water in its submission

Key issue in Yorkshire Water's submission	Summary of our response
The allowed return is set too low. The company argues the cost of capital is too low and does not reflect the risks Yorkshire Water faces. It argues the risk free rate, expected market return and beta are too low. It argues the cost of embedded debt should consider its actual debt costs and the cost of new debt is incompatible with the credit rating implied for the notional company by our determination. It argues our assumptions for issuance and liquidity costs are too low and the CMA should consider latest inflation outlook when making cost of debt calculations. Finally, the company also argues that the retail margin adjustment used to calculate the wholesale allowed return is unnecessary. Statement of case, paragraphs 218-245	Our determination provides a reasonable return for an efficient company. We consider that our point estimates are appropriately founded on evidence that the use of historical RPI is liable to overstate total market return, and that a negative risk-free rate derived from RPI-linked gilts is both supported by economic theory and in practice what financial market evidence implies over 2020-25. Our asset beta and debt beta are a balanced reading of the evidence at the time of our determination, and continue to be supported by new data. We consider that the company's higher cost of debt than our allowance relates to its decision to issue high-cost swaps. These are not a feature of our notional company or relevant to the efficient cost of issuing debt; customer should not be expected to fund these costs. There is a substantial body of evidence that the company, in common with others, is able to outperform our cost of new debt benchmark. We submit that using the Office for Budgetary responsibility's long-term estimate of the RPI-CPI wedge may give the best estimate of inflation over the 15 year investment horizon used in our final determinations. Finally, we do not agree with the company's assertion that the retail margin adjustment is unnecessary, considering that it corrects for a double counting of risk compensation accounted for in both the appointee allowed return and the retail margin. We discuss the allowed return in paragraphs 6.08-6.19 below.
Gearing outperformance mechanism. Yorkshire Water disagrees with the inclusion of the gearing outperformance mechanism and it puts further pressure on company investability. Statement of Case, paragraphs 246 to 259.	The gearing outperformance mechanism was introduced because we concluded that company decisions that increase gearing levels materially above the notional level are not appropriately aligned to the interests of customers. Where companies adopt high levels of gearing, they may increase risk to equity investors and reduce financial resilience, they also may transfer some risk to customers and or potentially taxpayers, in the event that a company fails. We discuss this further in paragraphs 6.20-6.21 below.
Stability of finance. Yorkshire Water states that it is critical that its ability to raise finance and the overall returns available to investors also remain relatively stable from one AMP period to another. (paragraph 262)	Our determination provides an efficient company with a reasonable return if it meets the cost allowances and performance commitments set out in our determination on the basis of the notional structure. Evidence since our determination supports our view that a company with the notional capital structure could maintain a credit rating that is two notches above the minimum of the investment grade.

	Under its actual structure, Yorkshire Water's credit ratings are constrained by interest coverage metrics and its high gearing.[259]
Timely addressing of financeability challenges Yorkshire Water considers that there was no real recognition of the financeability challenges until the very last stages of the price review (paragraph 264)	We signalled in the PR19 methodology, published in 2017, the potential financeability challenge resulting from the low real element of the allowed return versus the inflationary element. We also set out appropriate methods to address the challenge. We accepted the approach taken by a number of companies to meet the financeability challenge, to apply a faster transition to CPIH or to advance revenue. We applied an increase to PAYG rates for three further companies in draft determinations. Our overall approach to financeability is consistent with the approach adopted in past determinations and PR14 where we advanced revenue for some companies. The changes to the allowed return on revenue for the final determinations led to adjustments to revenue being advanced for 12 companies.
Addressing financeability challenges Yorkshire Water considers the response to its financeability challenge fell far short of providing any increased assurance that the company will be able to raise the debt required in the 2020-25 period. It states that its covenant definitions specifically exclude the benefit of any accelerated revenue and two rating agencies will disregard revenue acceleration in their rating assessments, hence interest cover remains below the threshold for a Baa1/BBB+ rating. (paragraphs 265 to 268) Yorkshire Water also considers the response to weak interest cover has to fundamentally impact value and not just be a timing solution. (paragraph 272)	We set the allowed return on the basis of a notional capital structure. It is not appropriate for customers to fund a higher return to satisfy the specific debt covenants put in place for Yorkshire Water's actual capital structure. Our financing duty does not tie the financeability assessment to rating agency methodologies. The financial ratios we use in our assessment are standard financial metrics. However, each rating agency applies different specific methodologies to the calculation of these metrics. We have set out previously how we consider it is appropriate to address the specific financeability issue for PR19 by advancing revenue in a net present neutral way. We consider cash flow profiling adjustments more fairly balance customer interests than permanent increases to customer costs through uplifting the allowed returns to equity.[260] This is consistent with the approach taken for three companies at PR14. We provide evidence in 'Risk and return - common issues' (chapter 4) that the revenue advanced in final determinations did not adversely impact the long-term financial resilience of the sector.

[259] Moody's Investor Services, 'Moody's downgrades Yorkshire Water's Class A notes to Baa2 and changes outlook to negative', March 2020. Moody's estimates gearing for Yorkshire Water of over 130% taking into account the fair value of existing borrowings as well as derivatives. The rating action states the rationale for downgrade of the Class A notes as reflecting 'the persistently high and growing mark-to-market loss (MTM) on Yorkshire Water's derivative portfolio, which was around GBP2.6 billion (37% of Regulatory Capital Value) as of January 2020.' and goes on to state 'Yorkshire Water's MTM is largely associated with RPI-linked swaps dating from the company's acquisition in 2008, many of which extend to the mid-2040s or beyond.'

[260] Ofwat, 'PR19 final determinations: Aligning risk and return technical appendix', December 2019 Section 6.3, pp. 83-87, 'Challenges about the use of financeability levers to advance revenues in our determinations'

Addressing financeability challenges through a higher allowed return Yorkshire Water considers the most direct remedy is for the CMA to provide a rate of return that is commensurate with the cost of capital. The company sets out that applying its version of the cost of capital should naturally result in an adjustment interest cover excluding advanced revenue above the 1.5x threshold indicated by Moody's for a Baa1 rating. (paragraph 269)	The allowed return should be determined on the basis of market evidence rather than set to achieve a specific financial ratio. Our determination provided a reasonable allowed return based on market evidence. Notwithstanding that we do not consider achieving an adjusted interest cover ratio of 1.5x to be a constraint in fulfilling the financing duty, Yorkshire Water does not provide a solution should the allowed return determined by the CMA lead to lower financial metrics. We discuss more detail on financeability in paragraphs 6.22-6.43 below.
Revenue advancement Yorkshire Water considers that acceleration of revenue to boost short-term interest cover is not a sustainable long-term fix for financeability. (paragraph 271)	The financeability constraint is particularly acute at PR19 due to the low real return on equity which is forward looking versus the allowed cost of debt which is substantially historical and includes higher interest rates before and around the time of the credit crunch. The revenue advanced in the final determination resulted in lower allowed revenue than if we had fully transitioned to CPIH indexation. We will reset the allowed return at PR24 based on market data at that time. We set out in 'Risk and return - common issues' document, chapter 4, how the evolution of the allowed return may be expected to improve financial ratios. Therefore, we do not consider there is a long-term financeability constraint.
Yorkshire Water's capital structure - Yorkshire Water considers its regulated debt platform operates in the long-term interests of its customers (paragraphs 273 to 276)	We assess financeability on the basis of the notional capital structure. However, we consider some companies, such as Yorkshire Water, with high levels of gearing and/or high cost of debt need to take steps to maintain their financial resilience. Under its actual structure, Yorkshire Water's credit ratings are constrained by interest coverage metrics and its gearing, resulting in a downgrade of its senior secured debt from Baa1 to Baa2.[261]
Investability of the notional efficient firm Yorkshire Water considers that an investor looking at the final determination as a package could not reasonably conclude that Yorkshire Water is a viable investment opportunity (paragraphs 277 to 281)	Yorkshire Water's final determination was sufficient to ensure it will be in a position to deliver its obligations and commitments to customers and included a reasonable allowed return on capital. Share prices of the listed companies following final determinations suggest investors see scope to outperform our determinations.

[261] Moody's Investor Services, 'Moody's downgrades Yorkshire Water's Class A notes to Baa2 and changes outlook to negative', March 2020. Moody's estimates gearing for Yorkshire Water of over 130% taking into account the fair value of existing borrowings as well as derivatives. The rating action states the rationale for downgrade of the Class A notes as reflecting 'the persistently high and growing mark-to-market loss (MTM) on Yorkshire Water's derivative portfolio, which was around GBP2.6 billion (37% of Regulatory Capital Value) as of January 2020.' and goes on to state 'Yorkshire Water's MTM is largely associated with RPI-linked swaps dating from the company's acquisition in 2008, many of which extend to the mid-2040s or beyond.'

Material consequences of the FD Yorkshire Water states that it has not been allowed the efficient costs necessary to deliver its business plan and faces a downside skew in its expected risk position (paragraph 283)	Our approach recognises that companies benefit from an asymmetry of information in preparing business plans. It incentivises companies to put forward stretching business plans and to deliver efficient services to customers. Yorkshire Water had significant opportunity through the review process to convince us that its requested costs were efficient and necessary, and to convince us that we should apply its performance commitment levels and ODI incentive rates.
Disconnect between risk and return Yorkshire Water says the final determination fails to strike the right balance with the absence of adequate risk mitigants and a failure to consider adequately the circumstances of Yorkshire Water.	Efficient companies have significant scope to outperform our determinations. There are significant risk protections in place, including inflation indexation, totex cost sharing, ODIs and revenue reconciliation mechanisms. PR19 includes additional mechanisms over past price reviews that further mitigate risk, including cost of new debt indexation, tax reconciliation, bespoke incentive rates for business rates and abstraction charges and reconciliation for the relative price effects of labour costs. Yorkshire Water has had significant opportunity through the price review process to provide convincing evidence in support of its circumstances. Yorkshire Water is highly geared and is recognised by Moody's to have high cost debt and estimates its gearing is over 130% taking account of the fair value of existing borrowings and derivatives. It is not appropriate customers bear the costs of Yorkshire Water's financing choices. We discuss this in more detail in paragraphs 6.44-6.55 below.

Considerations for the CMA

6.6 **The issues raised by Yorkshire Water on risk and return, including the balance of risk and return, the calculation of the allowed return and financeability predominantly relate to the common application of our policy across companies**. While we summarise our response to the issues raised by Yorkshire Water in the following sections, we refer the CMA to our 'Risk and return – common issues' document for a more detailed discussion of our view on these issues that are common to the disputing companies.

6.7 Yorkshire Water claims we failed to allow it to earn a **reasonable rate of return** as result of setting the return on capital and cost allowances too low and a balance of risk and return which exposes the company to material downside financial risk.[262] We disagree. The allowed return is reasonable based on our

[262] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 22, paragraph 70

assessment of the market information at the time of our determination. We consider our cost allowances reasonable and achievable for an efficient company and our determinations contain a balance of risk that is reasonable for an efficient company.

Our response to key issues raised by Yorkshire Water

Key issue – Calculation of the allowed return

6.8 Yorkshire Water claims that there are errors in the way we have calculated our allowed return. The company claims:

- That our use of the Bank of England's historical consumer prices index (CPI) series to derive estimates the **total market return** is problematic due to CPI not being measured over the full 1900-2018 period concerned.[263]
- That economic theory does not support a persistently negative real-terms **risk-free rate**, and that our point estimate should have incorporated evidence from nominal as well as RPI-linked gilt yields.[264]
- Our estimate of **equity beta** is lower due to our decision to focus on 2 year daily betas with a September 2019 cut off; the company argues we should follow an approach similar to PR14, involving rolling betas over a 5 year period and a cut off designed to avoid periods which might be affected by price review announcements.[265]
- That we had no basis to not allow costs associated with its swaps in our **embedded debt** allowance, and that its re-determined allowance should be based on its actual cost of debt.[266]
- That its overall allowed cost of debt should be based on its view of its actual average **ratio of new to embedded debt** over 2020-25 (12:88), rather than our notional assessment of 20:80.[267]
- Our **cost of new debt** benchmark of the iBoxx A/BBB minus 15 basis points was inappropriate, as interest cover for the notional company in our

[263] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 71, paragraph 219
[264] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 71, paragraph 219
[265] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp. 71-72, paragraphs 223-224
[266] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 73, paragraphs 230-232
[267] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 73, paragraph 232

final determinations was not consistent with an 'A' credit rating or any outperformance wedge applied to the iBoxx.[268]

- Our **issuance and liquidity costs** allowance of 0.1% is too low compared to other regulatory decisions.[269]
- Our **long-term inflation assumptions** are too high compared to the Office for Budgetary Responsibility's March 2020 forecast.[270]
- The **retail margin adjustment** of 4 basis points which we included is no longer necessary as the circumstances that caused it to be introduced at PR14 no longer prevail.[271]

6.9 We respond to all of the above issues in the 'Risk and return – common issues' document, chapter 3, and summarise our position below.

6.10 Yorkshire Water's concern with the historical CPI series we used to inform our estimate of **total market return** focuses on the absence of CPI measurement over the period 1900-1948. However, this issue arises for of RPI as well, which was first calculated in 1947. Due to the structurally higher formula effect present in latter-day RPI, a real return based on historical RPI-deflated returns and latter-day RPI indexation is liable to overcompensate investors through a higher nominal return than the historical average. We consider that the greater comparability of historical CPI outweighs any drawbacks of using the series.

6.11 We do not agree that a persistently negative **risk-free rate** is unlikely in economic theory, with a number of potential explanatory factors (eg demographics, weak and uncertain economic prospects) capable of sustaining such a phenomenon. We observe that 15 year gilt yields have been negative in CPIH-deflated terms since 2016; analysis of 2019 gilt yields also implied a market expectation that 15 year gilt yields in RPI-deflated (and by inference, CPIH-deflated) terms will be negative as far out as 2029.

6.12 Yorkshire Water endorses the argument of using both nominal and index-linked gilts as proxies for the **risk-free rate**. The case for placing weight on nominal gilts is weak, due to evidence of a strongly positive inflation risk premium. By definition, a risk-free rate should not contain risk premia. In the context of a sector with inflation-indexed bills and regulatory capital value, embedding an

[268] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 74, paragraph 235
[269] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 75, paragraph 241
[270] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp. 75-76, paragraphs 242-244
[271] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 76, paragraphs 245 and Annex 12

inflation risk premium in the cost of equity would also compensate investors for a risk they do not bear.

6.13 Statistical analysis by Europe Economics has found no evidence of downwards bias in daily **equity beta** data, while we consider that a point estimate drawing on 2 year and 5 year data (as used in our final determination) strikes the right balance between data that is recent enough for a forward-looking estimate of beta, and an estimation window that is long enough to not be unduly influenced by transient events.

6.14 The appropriate length of estimation window for **equity beta** is somewhat subjective. We consider that an approach drawing on 2 year and 5 year data (as used in our final determination) strikes the right balance between data that is recent enough for a forward-looking estimate of beta, and an estimation window that is long enough to not be unduly influenced by transient events. We observe there is tension in the company's suggestion to focus on 5 year betas while at the same time excluding periods which may be influenced by price control activity – moving back the 5 year estimation window would capture a period including the 2014 price review. We also observe that the CMA's 2015 sector asset beta range was 0.27 to 0.30 compared with our 0.29, indicating that this exercise might not even yield a particularly different answer.[272] As referenced in the accompanying report we submit, from Europe Economics, an unlevered beta of 0.29 remains justified following the approach the CMA has adopted in its provisional findings for the determination of NATS En-route Limited. Indeed Europe Economics retains the view it could be 0.26.[273]

6.15 Yorkshire Water proposes that the CMA departs from our notional approach to setting a cost of **embedded debt** allowance, arguing that this should be based on its 'all-in' cost of debt including swaps and **new to embedded debt ratio**. As recognised by Moody's, the company's high cost of debt is largely down to its large portfolio of inflation swaps entered into at the time of its acquisition in 2008.[274] These swaps left the company highly exposed to interest rate risk – a risk which has now crystallised. Swap costs are not relevant to the efficient cost of raising debt for the notional company, and customers should not bear the consequence of risky financing decisions by their supplier. We do not agree it is appropriate to reflect the company's forecast new debt share in its allowed return on debt. We consider that this would have undesirable impacts on the

[272] CMA, Bristol Water, A reference under section 12(3)(a) of the Water Industry Act 1991, Report, paragraphs, October 2015, paragraph 10.150
[273] Europe Economics, 'Further Advice on the Allowed Return on Capital for the Water Sector at PR19 – Betas and Gearing', provided as R033, May 2020, pp. 3-4
[274] Moody's Investor Service, 'Yorkshire Water Services Limited, Credit Opinion - Update following CMA appeal and downgrade of Class A bonds to Baa2', 13 March 2020

incentive to issue debt efficiently, and would not be in customers' long-term interests.

6.16 We do not agree that a single financial ratio should be used to infer the credit rating and **outperformance wedge** for the notional company, when considering our cost of **new debt** benchmark based on the iBoxx A/BBB. Firstly, we note following final determinations that several companies with gearing close to our notional assumption of 60% have retained a credit rating of Baa1 or higher.[275] Secondly, the average years to maturity of our benchmark index is 21 years, allowing outperformance potential by issuing at lower tenors. Thirdly, in practice we observe that traded yields on nominal bonds for all four disputing companies appear to be materially below the level of our cost of new debt benchmark.

6.17 Yorkshire Water cites previous regulatory decisions on issuance and liquidity costs in other sectors as evidence that our allowance of 0.1% for **issuance and liquidity costs** is too low. We are not convinced of the relevance of these estimates to the water sector. Our allowance drew on issuance costs for water bonds and an estimate of liquidity requirements tied to water sector characteristics. Our allowance was not controversial during the PR19 process and companies have not submitted bottom-up evidence supporting a different figure.

6.18 Yorkshire Water cites the Office for Budgetary Responsibility's March inflation forecasts as evidence that our **long-term inflation assumptions** are too high, leading to a cost of debt allowance in RPI and CPIH-deflated terms that is too low. We consider that the 15 year investment horizon we used in our analysis (which was not challenged by companies) indicates that the appropriate forecast should be the average over this period. We consider that the best estimate for CPI is the Bank of England's 2.0% inflation target; and for RPI to add the Office for Budgetary Responsibility's estimate of the long-term RPI-CPIH wedge. The Office for Budgetary Responsibility has recently lowered this estimate from 1.0% to 0.9%, therefore this remains a potential alternative to the company's suggested approach, which would yield a long-term RPI of 2.9%.

6.19 Yorkshire Water concludes that the justification for our 4 basis point **retail margin adjustment** to derive the wholesale allowed return from the appointee allowed return is a product of PR14 circumstances and no longer relevant for PR19. We note that, in common with its peers, the company did not challenge the retail margin adjustment during the price control process, including at its

[275] As of 14 Feb 2020 Moody's rated: Dŵr Cymru (56.0% gearing) as A3, Severn Trent (63.7% gearing) as Baa1, United Utilities (64.8%) as A3. (Company-reported gearing for March 2019)

higher levels of eleven basis points at earlier stages of the PR19 process. We continue to consider that there is a double count, which results from the allowed return being estimated at the aggregate level for the company (i.e. including wholesale and retail controls). As the 1.0% retail margin separately provides the allowed return for the retail control, there would be double recovery without adjusting for this via a deduction from the appointee allowed return.

Key issue - Gearing outperformance mechanism

6.20 Yorkshire Water sets out in its statement of case that it considered the introduction of a gearing outperformance sharing mechanism was an error, making the following arguments:

- it is incorrect that gearing up generates outperformance, as higher gearing increase the risk to equity, and hence its required return;[276]
- the varying levels of gearing observed in the water sector between 60% and 80% show that there is no single 'optimal level', and thus that the cost of capital is not sensitive to changes in gearing within this range; [277]
- statements made by the CMA and our advisors show support for the view that the allowed return is insensitive to gearing changes;[278] and
- the gearing outperformance sharing mechanism is harmful to Yorkshire Water and its customers because of the pressure it adds to the company's investability.[279]

6.21 Our regulatory approach has always recognised that there is no one-size-fits all level of gearing that applies for an efficient company and companies remain able to choose a level of gearing that is suitable for their circumstances following the introduction of the gearing outperformance mechanism. We set out the reasons why we proposed to adopt the mechanism and the reasons why we consider the application of it is consistent with accepted economic and corporate finance theory in chapter 3 of 'Risk and return – common issues'.

[276] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp. 76-77, paragraph 251
[277] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 77, paragraph 256
[278] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 78, paragraphs 257-258
[279] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp. 78-79, paragraph 259

Key issue - Financeability

6.22 The key issues raised by Yorkshire Water in relation to financeability are principally thematic across the disputing companies. The company sets out that:

- our determination fell short of providing assurance Yorkshire Water will be able to raise the finance it needs as its **covenants** exclude the benefit, and two credit rating agencies disregard, accelerated revenue meaning interest cover remains well below the threshold for a **Baa1/BBB+** rating;[280]
- our determination restricts the **appetite of debt investors,** increases the sector-wide cost of debt and adversely affects the sector's financial resilience;[281]
- **accelerating cash flows** to address a financeability constraint is not a sustainable long-term fix for financeability. The company argues accelerated revenue implies the response to weak interest cover has to fundamentally impact value rather than timing of cash flows;[282]
- we are incorrect to say our financial model contains **a suite of financial ratios** that are commonly used by credit rating agencies;[283]
- its **regulated debt platform** in fact provides additional protections in the long-term interests of customers;[284] and
- the **notionally efficient firm is not investable** and submits a consultancy report that quantifies an expected loss of 100 basis points against the allowed return.

6.23 The key issues raised by Yorkshire Water in relation to financeability are broadly common with some of the issues raised by the other disputing companies. Our determination provides Yorkshire Water with a reasonable return if it meets the cost allowances and performance commitments set out in our determination on the basis of the notional structure. We discuss these issues further in the 'Risk and return – common issues' document. And, as noted in chapter 2, the issues raised by the company are not in truth 'hard-edged' questions whether we have failed to meet our statutory duties, but

[280] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp. 79-80, paragraph 265
[281] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 80, paragraph 268
[282] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 81, paragraph 271
[283] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 81, paragraph 272
[284] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p. 82, paragraph 273-276

rather disagreements as to the merits of decisions we made in the final determination.

6.24 We considered that Yorkshire Water's final determination was financeable based on the revenue and cost allowances which include a reasonable allowed return on capital. The final determination was sufficient to ensure it will be in a position to deliver its obligations and commitments to customers.

6.25 The interest cover definitions in Yorkshire Water's debt **covenants** are a matter for the company as they relate to its actual capital structure. This is consistent with our long held view that companies are responsible for their own choices around financing and capital structures, within the framework of the price review, company licenses and company law – and this responsibility extends to taking responsibility for their own structures, including any covenants that underpin their actual structures.

6.26 We see evidence that efficient companies with gearing around the level of the notional company can maintain credit ratings two notches above the minimum investment grade **(Baa1/BBB+)**. Therefore, we disagree that efficient companies are not able to access the long-term debt markets. We set out the current credit ratings for the water companies in the 'Risk and return – common issues document', chapter 2.

6.27 We provide evidence in the 'Risk and return – common issues' document, chapter 3 that bonds issued by companies in the water sector following our determination have achieved much lower coupons than our cost of new debt benchmark of iBoXX minus 15 basis points. United Utilities – a company whose gearing of 64.8% is close to our notional 60% - has also stated that it typically outperforms our final determinations cost of new debt benchmark by 50-100 basis points.[285] Contrary to the view expressed by Yorkshire Water, this indicates there remains strong **appetite of debt investors** to invest in efficient companies.

6.28 We respond to the issue of **accelerating cash flows** through the use of financial levers (PAYG and RCV run-off rates) in 'Risk and return - common issues', chapter 4. We, like the credit rating agencies, consider a range of financial ratios and other factors in assessing financeability. The adjusted interest cover is one of the factors taken into account by Moody's and Fitch in determining credit ratings, along with business risk and other financial metrics. Funds from operations to net debt has the same weighting in the ratings scorecard for Moody's as adjusted interest cover. Whilst important, we do not consider the

[285] United Utilities, 'Capital Markets Day', 2 March 2020, slide 26

guidance of 1.5x for adjusted interest cover to limit the credit rating. We see evidence of this in recent rating opinions.[286]

6.29 We disagree that it is appropriate to artificially increase the allowed return on equity to provide additional headroom in financial metrics. This would provide equity investors with a return on their investment in excess of the market return. Aiming up the allowed return at a time when cash returns are low would require a reduction in returns to below market rates in future periods; otherwise adjustments would be asymmetric and would result in customers paying more over the economic cycle. This is also likely to undermine regulatory predictability and the transparency of the determination of the allowed return on capital.

6.30 Equity investors earn their return as in-period dividends and growth of their investment in the RCV, either through retained earnings, or additions and indexation of the RCV. We set out in chapter 4 of 'Risk and return - common issues' that the financeability constraint at PR19 is a timing issue, resulting from a disproportionately low proportion of the return earned in-period versus indexation of the RCV. This is partly mitigated through the transition to CPIH. It is therefore appropriate to advance revenue to adjust the timing of cash flows using financial levers to address the constraint. The CMA may choose to apply a faster transition to CPIH as an alternative method of rebalancing cash flows.

6.31 We do not agree that the use of financial levers is necessarily required as a fix for a long-term financeability constraint. We set out in chapter 4 of 'Risk and return – common issues' that we do not consider there is a long-term financeability constraint. The financeability constraint is particularly acute at PR19 due to the low real return on equity which is forward looking versus the allowed cost of debt which is substantially historical and includes higher interest rates before and around the time of the credit crunch.

6.32 We will reset the allowed return at PR24 based on market data at that time. At this time we expect that older more expensive debt will continue to have been refinanced for cheaper debt at lower current interest rates. This will ease pressure on interest cover ratios. Further transition to CPIH may also have a

[286] For example, in Moody's recent credit opinion for Portsmouth Water, 'Portsmouth Water Limited, Update following rating confirmation at Baa1, negative', March 2020, page 2, Factors that could lead to a downgrade, Moodys state 'In addition, the rating could be downgraded if Portsmouth Water was likely to exhibit gearing, measured by net debt to regulatory capital value (RCV), above 80%, and an Adjusted Interest Coverage Ratio (AICR) persistently below 1.5x. We note, however, that significant gearing headroom may allow the company to sustain an AICR slightly below this level.'

positive effect on the real return on equity at PR24. We set out how the evolution of the allowed return may be expected to improve financial ratios.

6.33 Our financial model includes a **suite of financial metrics** which underpin our financeability assessment. These include debt ratios, equity ratios and other return metrics. These metrics draw on common approaches used in the financial markets and reflect those used by the credit rating agencies in their assessment of credit ratings.

6.34 We do not seek to exactly replicate the methodologies used by the rating agencies. This is a long standing approach. Each water company has credit ratings from up to three rating agencies, Fitch, Moody's and Standard and Poor's. Each rating agency has different rating methodologies and applies variations to these depending on the specific circumstances of each company. This includes focus on different financial ratios and the calculation of ratios in different ways. We note that this leads to variations of credit ratings for water companies across the rating agencies. It would not be practical to assess financeability under each rating agency's methodology simultaneously.

6.35 We also note that the guidance provided by credit rating agencies varies over time. Strict adherence to rating agency methodologies would result in the **cost to customers being influenced by the opinions of credit rating agencies**. We provide further explanation of this issue in chapter 4 of 'Risk and return – common issues'.

6.36 We set our determination and assess financeability on the basis of the notional capital structure. Yorkshire Water sets out[287] that issues related to its capital structure are not at issue in this redetermination, yet it also claims[288] our determination falls short of giving it the assurance it needs that its determination will enable it to raise debt finance in part because of its covenant definitions

6.37 We consider our determination allows an efficient company, with a notional capital structure to raise finance necessary to deliver its obligations and commitments to customers. We commented on the financial resilience of the Yorkshire Water's actual structure in the final determination and in our 'introduction to the CMA'.[289] We consider that some companies, such as

[287] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp. 81-82, paragraphs 273-276
[288] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp. 79-80. paragraph 265
[289] Ofwat, 'Referral of the determination of price controls for the period from 1 April 2020: Cross-cutting issues', March 2020, p.78-79, paragraphs 7.22-7.26

Yorkshire Water, with high levels of gearing and/or a high cost of debt need to take steps to maintain their financial resilience.

6.38 Yorkshire Water's actual capital structure does not affect the assessment of financeability as we do this based on the notional capital structure. Companies are responsible for their choice of financing and capital structure and should bear the consequences of their choices. However, reflecting the expectation of a lower allowed return on capital at PR19, we have, for some time, signalled a need for highly geared companies to ensure their actual financial structures remain resilient and, where necessary, to amend their financing structures to ensure long-term resilience.[290]

6.39 Yorkshire Water is a highly geared company. Yorkshire is a highly a geared company, reporting gearing of 75.8% at 31 March 2019. We discuss the impact of Yorkshire Water's capital structure on its credit ratings and financial resilience in chapter 1 and in further detail in the 'Risk and return – common issues' document, chapter 2.

6.40 Yorkshire Water claims the notionally efficient firm is not **investable**. It claims we have under estimated expenditure, overstating performance levels, skewed the incentive regime to underperformance payments, set too low a return and provided inadequate interest cover.[291] It supports its view with a third party report it commissioned from Economic Insight that estimates an expected shortfall of 100 basis points against the allowed base equity return.[292]

6.41 The cost allowance and performance levels set in our determination followed a rigorous process. The company had significant opportunities through the determination process to convince us that its costs and performance levels were set at the right level. The allowed return reflects market evidence at the time we set the determination, following extensive consultation and provides a reasonable return for an efficient company, which can expect to earn the allowed return if it fulfils its performance commitments within the totex allowances.

6.42 We have signalled a lower return throughout the price review process and published our early view allowed return on capital in the PR19 methodology in December 2017. We updated the allowed return on capital in the draft determinations and set out the increased use of incentives to align company

[290] See for example, Cathryn Ross's speech at Moody's conference in 2017.
[291] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp.82-83 paragraphs 277-278
[292] Yorkshire Water, Annex 01 – EI – Financeability of the notionally efficient firm, a bottom-up analysis

objectives with the best interest of customers. At this point, we also signalled the potential for a lower return at the final determinations. Investors had a clear view of the objectives for PR19 throughout the process.

6.43 We have not seen any evidence of unwillingness of investors to invest in the water sector before or after we published the final determinations. We set out in chapter 4 of 'Risk and return – common issues' the market to asset value analysis of the listed water companies who traded at a material premium to the regulated equity value following the publication of final determinations.[293]

Key issue: Aligning Risk and return

6.44 Yorkshire Water argues that the final determination results in a disconnect between risk and return and an asymmetric package of measures which means the notionally efficient firm is not investable. The company claims:

- the approach to incentives and rewards is skewed to the downside (meaning that Yorkshire Water is facing significant penalty exposure in AMP7) and encourages the avoidance of penalty rather than service improvement;[294]
- our incentive regime is skewed towards penalty payments;[295]
- modelling by Economic Insight indicates that the downside skew of its penalty position will be in excess of £150m during AMP7 in the absence of management mitigating actions;[296] and
- these challenges have been further heightened during PR19, because of the changes made to the totex sharing mechanism. Sharing rates have been substantially reduced as a result of us having decided (in Yorkshire Water's view, erroneously) that Yorkshire Water has departed from its long track record of cost efficiency.[297]

6.45 We disagree with Yorkshire Water's assertions that the incentive and reward regime is skewed to the downside, taking account of outturn performance. The cost allowances and performance levels included in our final determination

[293] Ofwat, 'Referral of the PR19 final determinations: Risk and return – response to common issues in companies' statements of case', May 2020, chapter 3
[294] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp. 2-3, paragraph 11
[295] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p 82, paragraph 277
[296] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p 84, paragraph 283
[297] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p 88, paragraph 299

were stretching but achievable for an efficient company. Our determination provided Yorkshire Water with a reasonable return if it meets the cost allowances and performance commitments set out in our determination on the basis of the notional structure. The company has significant scope to earn upside from outperformance as well as the risk of lower returns from underperformance, with a small positive skew overall to its overall risk range.

6.46 ODIs are intended to incentivise companies to follow through on their business plans, and only go further where this is what customers want. While we recognise ODIs are impacted to a degree by exogenous risk, company management has material influence over ODI performance – this is a company-specific risk and is thus to a large extent diversifiable. We set out the evidence on past performance on ODIs in further detail in the 'Risk and return – common issues' document, chapter 4.

6.47 In the PR19 methodology consultation, companies had full sight of the intention to remove cost sharing menus applied at PR14 and introduce asymmetric cost sharing rates. Our aim in doing so was to simplify the regulatory approach compared with PR14, and to provide increased incentives on companies to deliver stretching cost forecasts in business plans in addition to providing ongoing incentives to deliver cost efficiency and protection in the event of overspend.

6.48 Yorkshire Water had significant opportunity through the PR19 process to convince us of the need for the costs requested in its business plan, which it failed to do. Our approach recognises there is an asymmetry of information between companies and us (and in the case of the redetermination, the CMA), and in the absence of appropriate incentives, companies are likely to bid up requested cost allowances. Our approach ensures companies that have the most efficient business plans and subsequently deliver the most efficiencies retain the greatest share of outperformance; companies with the least stretching plans and that deliver the least efficiencies bear a greater proportion of the cost of underperformance. We consider that any ex post unwinding of the cost sharing rates set could undermine our ability to establish appropriate incentives in the future and therefore damage consumer interests.

6.49 Evidence presented in the 'Risk and return – common issues' document shows that Yorkshire Water outperformed the cost allowances we set in all of the last four control periods. Yorkshire Water, if efficient, can continue to deliver its commitments and obligations to customers within the cost allowances we set, with incentives to outperform. We discuss these issues further in the 'Risk and return – common issues' document.

6.50 The Economic Insight report commissioned by Yorkshire Water claims that:

- a risk-based interpretation of the financing duty is essential;
- there is only a very low likelihood of an efficient firm being investable for equity;
- an efficient firm has a low likelihood of having credit metrics consistent with being able to raise debt finance on reasonable terms; and
- our published financial ratios are not consistent with the financeability of an efficient firm.[298]

6.51 The report considers three issues with the approach to financeability:

- it is not clear that the notionally efficient firm is financeable based on our calculation of financial ratios;
- we set an 'unachievable' efficient challenge for the notionally efficient firm; and
- we failed to take into account the 'risk and uncertainty' around what the efficient firm can offer.[299]

6.52 The report focuses primarily on the claimed 'risk and uncertainty' of an efficient firm. We have responded to the issues regarding the use of financial ratios earlier in this section, and we address the level of stretch in the final determinations in 'Introduction and overall stretch'.

6.53 The premise on which the underlying analysis is made is incorrect:

- The report assumes a minimum adjusted interest cover of 1.5x is necessary for a credit rating of Baa1. This is incorrect. Adjusted interest cover is just one elements of the credit rating assessment. For example, funds from operations to net debt has the same weighting in the ratings scorecard for Moody's as adjusted interest cover. Whilst important, we do not consider the guidance of 1.5x for adjusted interest cover limits the credit rating.
- If the premise on which Economic Insight's claims is made were correct (that an adjusted interest cover of 1.5x were necessary to achieve a Baa1 credit rating as set out on page 19 of its report), then credit ratings of Dŵr

[298] Yorkshire Water, Annex 01 EI – Financeability of the notionally efficient firm: a bottom-up analysis, April 2020, p. 2
[299] Yorkshire Water, Annex 01 EI – Financeability of the notionally efficient firm: bottom-up analysis, April 2020, p. 8

Cymru, Severn Trent Water, Wessex Water and Portsmouth Water would be lower than the current credit rating of Baa1, which is not the case.[300]

6.54 Our financeability analysis takes account of the approach adopted by credit rating agencies, we understand Monte Carlo risk-based analysis is not the focus of the credit rating agencies in carrying out their assessment.

6.55 Even if the premise of Economic Insight's analysis were correct, the assumptions on which its analysis is based is incorrect. For example:

- The notion of a negative assumption for frontier shift is implausible for a sector where there are not large swings in demand over the long term.[301]
- As set out in 'Risk and return - common issues', evidence from company performance shows there to be a skew to outperformance. Taking account of base totex and enhancement totex, Economic Insight use a skew to underperformance.[302]

[300] Yorkshire Water, Annex 01 EI – Financeability of the notionally efficient firm: bottom-up analysis, April 2020, p. 19
[301] Yorkshire Water, Annex 01 EI – Financeability of the notionally efficient firm: a bottom-up analysis, April 2020, p. 56
[302] Yorkshire Water, Annex 01 EI – Financeability of the notionally efficient firm: a bottom-up analysis, April 2020, p. 55 and 59

7. Accounting for past delivery

Summary

7.1 In our PR19 final determination for Yorkshire Water, we used our published PR14 reconciliation models to adjust revenue and RCV to account for a range of past performance, such as outcome delivery performance where there were financial incentives, expenditure performance against allowances, and the wholesale revenue forecasting incentive. Yorkshire Water is disputing only the application in the final determination of the wholesale revenue forecasting incentive mechanism.

7.2 We set out in our introduction to the CMA[303] that in our PR19 final determination we included the full revenue collected by the company throughout 2015-20 in the wholesale revenue forecasting incentive mechanism (WRFIM). This led to a total WRFIM adjustment changing from -£26.1 million as proposed by the company to -£49.5 million in the final determination. We did so because Yorkshire Water did not present sufficient evidence of what its forecast of connection charges was in 2014, since the business plan only contained aggregated values for third party income. To demonstrate its alleged error Yorkshire Water has only presented the outturn actual revenues to us throughout 2015-19. We removed Yorkshire Water's proposed adjustment so as not to set a precedent of removing the incentive to forecast revenues accurately.

7.3 Secondly, even if we had certainty about the forecasts the company would have made in its PR14 business plan, the adjustments the company proposes are not appropriate. The error the company says it made would have affected not only the assumptions of revenue from third parties and through grants and contributions towards new connections, but it also would have changed the PR14 totex allowance and thus RCV. Yorkshire Water fails to take account of the wider impacts of its alleged error in its statement of case.

7.4 Table 7.1 highlights the key issue raised by Yorkshire Water in its statement of case in relation to the PR14 reconciliations and a summary of our response to it.

[303] Ofwat, Reference of the PR19 final determinations: Explanation of our final determination for Yorkshire Water, April 2020, pp.42-44, paragraphs 290-299

Table 7.1: Key issue on the PR14 reconciliations raised by Yorkshire Water in its submission

Key issue in Yorkshire Water's submission	Summary of our response
In its statement of case, paragraphs 204-215, Yorkshire Water sets out that in the PR14 reconciliation called the Wholesale Revenue Forecasting Incentive Mechanism (WRFIM) we have not taken into account information the company provided from 2015 onwards and has penalised it by £44 million as a result.	We set out in paragraphs 7.8 and below why we consider Yorkshire Water's proposed adjustment to WRFIM was inappropriate. We did not have any forecast figures to compare outturn with which is the purpose of the forecasting incentive mechanism. Also, the overall impact of the error Yorkshire Water made in its PR14 business plan is far more complex than the company claims in its statement of case, affecting totex, RCV, starting revenues and K factors, as well as allowed revenue. We consider our final determination approach, of not adjusting WRFIM as Yorkshire Water proposed was a measured and appropriate response to the issue. We discuss in more detail in paragraphs 7.8-7.16 and Appendix 1 below.

Considerations for the CMA

7.5 Our PR14 reconciliation mechanisms are aspects of the PR19 price review that are not much contested. We consulted on our approach to these reconciliations at the start of the 2015-20 period[304] and followed our published approach carefully through PR19. The only areas of disagreement were where companies overwrote the mechanistic inputs to the reconciliation models and did not provide appropriate evidence for their adjusted inputs. Yorkshire Water's revenue was one such area of disagreement throughout the PR19 price review. We set out below why we did not allow the adjustments proposed by the company, as we also explained at the final determination.

7.6 In order to provide confidence in the accuracy and legitimacy of regulatory process we apply a high bar for error correction and therefore we only correct unambiguous errors. Given this mechanism aims to incentive accurate forecasts we consider the company should have submitted evidence of its forecasts with data made available at the time of the submission of PR14 business plans and not simply with outturn values for us to be able to compare forecasts with outturn as required by the mechanism.

7.7 We also note that the company's proposal does not adequately consider systematically and holistically the effects of the errors it claims to have made.

[304] Ofwat, Consultation on the PR14 reconciliation rulebook, March 25, 2015

Our response to key issues raised by Yorkshire Water

Key issue - Wholesale revenue forecasting incentive mechanism

7.8 We set out in our Introduction to the CMA[305] that in our PR19 final determination we included the full revenue collected by Yorkshire Water throughout 2015-20 in the wholesale revenue forecasting incentive mechanism. This led to a total WRFIM adjustment from -£26.1 million as proposed by the company to -£49.5 million in the final determination.

7.9 In its statement of case,[306] Yorkshire Water fails to evidence what its forecasts were in a compelling way. It still does not present documents dated from 2014 with the forecasts it would have made. It provides Appendix 3 to Annex 11 to its statement of case which are intended to evidence the disaggregated value of connection charges included in its 2012-13 statutory accounts but there is no evidence that its forecasts for 2015-20 were based on the income it received in 2012-13. We would expect a company to prepare forecasts for connection charges based on the expected level of future developer activity in its area which may be different from the past.

7.10 It also fails to set out the wider impacts of its PR14 error. Instead it states that by agreeing to how the revenue should be reported in 2015-20 we had agreed to its different treatment in the WRFIM past delivery mechanism. Reading the documents the company has provided to the CMA[307] shows that the impact of the error and how to consider it in the WRFIM was not discussed or agreed at any point during 2015-20.

7.11 In our introduction to the CMA,[308] we stated that the alleged reporting error the company asked us to correct for in truing up for past performance would have resulted in higher PR14 allowed totex. Yorkshire Water disputes this[309] and asks the CMA to overwrite the inputs to the wholesale revenue forecasting incentive mechanism (WRFIM) PR14 reconciliation model to remove connection charges from its recovered revenue. It asks for this as a way of

[305] Ofwat, Reference of the PR19 final determinations: Explanation of our final determination for Yorkshire Water, April 2020, paragraphs 290-299
[306] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, pp.67-70, paragraphs 204—215.
[307] Yorkshire Water, Annex 11 Paper by Mark Ballamy re WRFIM and its eleven appendices.
[308] Ofwat, Reference of the PR19 final determination: Explanation of our final determination for Yorkshire Water, April 2020, paragraph 2.95
[309] Yorkshire Water Services, 'Yorkshire Water - PR19 redetermination Statement of Case', April 2020, p.70, paragraph 212

neutralising the impact of its reported error on the true-up and penalty calculation.

7.12 Yorkshire Water's suggestion for dealing with the error it made in its PR14 business plan has two problems:

- There are indeed knock-on effects throughout the PR14 final determination that the company has not considered; and
- Taking it into account removes any incentive for accurate forecasting, the whole reason for the Wholesale Revenue Forecasting Incentive Mechanism.

7.13 Despite not being convinced that these figures correspond to the forecasts made at the time of the 2014 business plan, we have used the restated wholesale revenue figures that Yorkshire Water provided as if we had them at the PR14 business plan stage and input them in to our PR14 modelling suite. To calculate the restated figures we moved £22 million from third party income and added it to grants and contributions in the business plan table W9.

7.14 What Yorkshire Water has failed to take into account is that as part of the PR14 totex allowance, we made an allowance for third party costs outside the totex menu. We calculated these costs directly from the forecast third party income, by multiplying the company's total income forecast by 114%.[310] If Yorkshire Water had reported £22 million as connection charges instead of third party costs its PR14 totex allowance would have been lower by £25 million. This in turn would have reduced the 2019-20 closing RCV by £10 million. Our calculations also show that if Yorkshire Water had set out its business plan as described above the amount of revenue allowed for the calculation of bills would have increased by £27 million (not the £44 million it claimed) due to:

- -£16 million – PAYG revenue reduction due to the lower totex allowance;
- -£2 million reduced runoff and lower depreciation on a lower RCV
- +£22 million increase due to taking off a lower third party income from revenues; and
- A further +£22 million grants and contributions income rather than third party income.

[310] See tab 'P3' of Ofwat, PR14 Yorkshire Water's PR14 water cost threshold model, December 2014 where we allowed a total of £32.537 million (2012-13 prices) for third party costs

7.15 These changes would have resulted in different starting revenue and K factors than we made at the PR14 final determination. We show our detailed calculations in Appendix 1 of this document.

7.16 We acknowledge there might have been a reporting error but considered the evidence presented regarding the connection charges forecast was not compelling and given the risk of creating a precedent of a company using an error reported retrospectively to avoid a forecasting penalty, we did not amend the revenue recovered in the WRFIM model to correct for the alleged error in Yorkshire Water's PR14 business plan forecasts. Even if that was not the case, Yorkshire Water's proposed remedy does not take all these aspects into account, which is why we consider not amending the revenue recovered in the WRFIM model would still be the most appropriate action to take.

Conclusion

7.17 Yorkshire Water's proposal to the CMA does not protect customers from the impacts of its alleged PR14 revenue forecasting error. Our final determination approach to WRFIM adjustments provided protection for customers in a way that is closer to the result of these calculation than what the company is requesting in its statement of case.

7.18 We consider that our final determination approach was a pragmatic and reasonable solution to the issues that the alleged error raises. We used the full revenue reported in the WRFIM calculation so as to retain the power of the forecasting incentive and protect customers from the impacts of the alleged error, because the error and its impacts, was not unambiguous.

8. Appendix 1 Detailed past delivery calculations

A1.1 The figures in this appendix are in 2012-13 prices, which was the price base of the 2014 price review.

A1.2 Forecast third party income was in input into Yorkshire Water's PR14 model cost threshold model, which calculated wholesale water totex allowance.[311] The third party cost allowance was calculated using historical reported recovery rates, the ratio of third party costs to third party income. For Yorkshire Water this meant our cost allowance for third party costs was 114% of its forecast third party income. Since the business plan forecast total third party income was £28.5 million, our third party cost allowance was £32.5 million.

A1.3 In order to calculate a revised third party cost allowance we reran Yorkshire Water's cost threshold model removing £22 million of the third party income forecast, as given in Yorkshire Water's updated table W9. This means we reduced the third party cost allowance by £25 million, that being 114% of £22 million.

A1.4 We used the revised third party cost figure in the published third party cost allowances and the £22 million increase in grants and contributions as revised input into Yorkshire Water's PR14 financial model.[312]

A1.5 This caused allowed totex to fall by £25 million over the 2015-20.

Water wholesale allowed revenue - 5 year total 2012/13 FYA RPI deflated price base	PR14 Final determination	Revised Financial model	Change £m	% change
Totex - Water	1,516	1,491	(25)	-1.67%

A1.6 With a fall in totex of £25 million and an average PAYG rate of circa 63% closing RCV falls by £10 million in real terms.

Water wholesale allowed revenue - 5 year total 2012/13 FYA RPI deflated price base	PR14 Final determination	Revised Financial model	Change £m	% change
Water closing RCV 2012-13 FYA RPI deflated prices	2,418	2,408	(10)	-0.39%

[311] Ofwat, Yorkshire Water's PR14 populated final determination cost threshold model, December 2014, tab 'P3', Third party costs
[312] Ofwat, Yorkshire Water's PR14 populated financial model December 2014.

Water wholesale allowed revenue - 5 year total 2012/13 FYA RPI deflated price base	PR14 Final determination	Revised Financial model	Change £m	% change
PAYG	952	936	(16)	-1.67%
Pension Deficit Repair Allowance	23	23	-	-
Equity Issuance Cost	-	-	-	-
Return on Capital	425	424	(1)	-0.19%
Depreciation	382	381	(1)	-0.18%
Tax	-	-	-	-
Operating income	-	-	-	-
Other Income (incl 3rd party income)	(35)	(13)	22	-63.25%
Post financeability adjustments (including tax effects)	116	117	0	0.32%
Allowed Revenues (pre profiling)	1,863	1,868	5	0.27%
Profiling adjustment	-	-	-	-
Profiled Allowed Revenues	1,863	1,868	5	0.27%
Capital contributions from connection charges and revenue from infrastructure charges	42	64	22	53.10%
Final Allowed Revenues	**1,905**	**1,932**	**27**	**1.43%**

A1.7 The impact of this on the allowed revenue in the financial model is shown below. The change in totex results in reductions in PAYG revenue. The size of the deduction for 'other income' is reduced by £22 million. In addition, there is an increase in capital contributions of £22 million, leading to revenue being £27 million higher than originally modelled.

A1.8 The impact on the PR14 starting allowed revenue and K factor for wholesale water is shown in the two tables below.

£m nominal	2014/15
Orginal Water starting allowed revenue in FD letter	392.889
Revised Water starting allowed revenue	398.945
Change	6.056

Description	2016/17	2017/18	2018/19	2019/20
Original Water K in FD letter	1.70	1.37	0.90	0.82
Revised Water K	1.66	1.29	0.83	0.80

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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