

**Cost efficiency – Yorkshire
Water Draft Determination
Representation
REDACTED**

Contents

Contents	2
Securing cost efficiency overview	4
1. Significant concerns about Ofwat’s implementation of cost assessment	8
2. Changes we have made to our business plan for the sake of finding a workable solution	10
3. Minor changes we have made to our business plan due to new information	12
4. Concerns about the assessment of WINEP costs	12
5. Further outstanding areas of material disagreement	13
Water Industry National Environment Programme	16
1. Overview	16
2. Reclassification of expenditure from base to enhancement	17
3. The decision not to re-phase our WINEP programme	22
4. p-removal enhancement modelling	23
5. WINEP enhancement efficiency challenge	28
6. Base expenditure modelling	31
7. Recap of conclusions	32
WINEP data tables	34
Ofwat feedback	34
Our response	34
Frontier shift and real price effects	35
Overview	35
Frontier shift	36
Real price effects	40
Business rates	45
The path to the draft determination	45
Manifest flaws in the approach that Ofwat has used	45
Ofwat’s overall approach is flawed since it treats business rates as a cost whereas they are in fact a tax	49
Drinking water quality	51
Overview	51
Base expenditure modelling (Treatment Complexity)	51
Calculation of implicit Opex allowance	54
Traffic management act costs	56
The path to the draft determination	56
Evidence to support an alteration to the PAYG rate.	63
Achieving UQ service targets and achieving further service improvements	64
Ensuring efficient management of resources	66
Impact on speed of money and customer bills	67
Metaldehyde costs	69
Ofwat feedback	69
Our response	69
Reinstatement of Metaldehyde costs	69
Summary	71
Strategic regional water resource development	73
Ofwat feedback	73
Our response	73
About Water Resources North	74
WRN’s priorities	74
Summary	75
Bioresources fixed and variable costs	76
Ofwat feedback	76

Our response	76
Hull and Haltemprice Resilience Investment	85
Annex	91
Annex 1	91
Annex 2	93

Securing cost efficiency overview

This document provides an overview and introduction to the significant concerns that we have in relation to Ofwat's assessment of cost efficiency. We focus here on issues that relate directly to Ofwat's approach to quantifying our cost allowances. However, as set out elsewhere in our representation and in previous submissions, any assessment of efficient costs must consider the inescapable direct relationship between costs and outcomes. As such, this section of our representation must be seen in the context of the complete updated business plan that we are submitting.

At the Draft Determination, we were surprised and disappointed by the continuing difference between our view of efficient costs and Ofwat's. We were also concerned that Ofwat did not engage with the substantial evidence presented as part of our IAP response submission and that Ofwat also chose to introduce further substantial changes of approach with limited evidence or consideration of the consequences of the changes.

We remain of the view that the costs we submitted in September 2018 and April 2019 are the most robust estimate of the efficient costs that we will incur over AMP7 to deliver our statutory obligations and the outcomes in our plan.¹ Through the PR19 process, we have not received new information or regulatory evidence that has led us to materially change our view of efficient costs.

Ofwat's models continue to show that Yorkshire Water's actual base costs have remained highly efficient. As is shown in the figure below:

- Ofwat's PR19 DD models show that both our water and wastewater costs have been more efficient than the benchmark level of efficiency (the upper quartile (UQ)).
- in previous price reviews, since 2002, we have also been assessed as highly efficient.

¹ Only minor changes were made to our business plan costs between September 2018 and April 2019 submissions to reflect new information or correct errors

Table 1: Efficiency ratings of actual historic costs in price reviews since 2002

	Pre PR09	PR09	PR14	PR19 (DD)
Water opex	Band A	Band A (upper)	94.3% totex	More efficient than UQ benchmark
Water capex	Predominantly Band A	99.5%		
Wastewater opex	Band A	Band A (lower)	99.5% totex	More efficient than UQ benchmark
Wastewater capex	Band A	93%		

Source: Yorkshire Water review of regulatory documents.

Notes: Pre PR09 comparative efficiency assessments were used annually. In PR09, opex remained under comparative efficiency and CIS used for capex. YKY was the only WaSC assessed as efficient in both services. In PR14 the industry moved to totex and menu regulation. PR19 DD results based on triangulated efficiency scores from Ofwat’s published spreadsheet models.

It is evident that the approach used by Ofwat at PR19 has so far failed to adequately distinguish between levels of activity and cost efficiency. Ofwat’s cost mindset appears to have been dominated by a simple comparison of the historical and future costs. As a result, any company that starts from an efficient position, includes ambitious performance improvements and has a large statutory programme arising from WINEP has been assessed as substantially inefficient. In contrast, companies with a high-degree of base inefficiency, completing large investment programmes in the current period and limited environmental programmes are viewed as having transformed their efficiency position rather than having reduced their level of activity.

These flaws are compounded by Ofwat’s failure to recognise the efficiency challenges applied by the companies themselves. In response to the methodology, we challenged ourselves to make an upfront efficiency saving of 16% in our forecast costs. Almost all companies included a double-digit percentage reduction in costs in their forecasts, but Ofwat’s cost approach has acted to ignore these savings. When combined with the use of parsimonious model specifications, the belief that all model error is inefficiency and a one-size fits all mindset, together with arbitrary further reductions in costs based on Ofwat’s erroneous belief that the companies themselves are not making a step change in efficiency, the result is cost interventions on a heroic scale. Cost challenges of circa 50% would normally trigger doubts on the validity of the modelling method and additional quality assurance to ensure unintended consequences are not present. However, Ofwat appears to have taken no such steps.

Notwithstanding the manifest flaws highlighted above, our priority is to focus on delivering our plan for our customers, and we wish to find a workable compromise with Ofwat. For the sake of finding

such a workable compromise, we would be willing to accept a higher level of risk and therefore in this representation we submit costs that are closer to Ofwat's view. In particular, we have removed £335m from our submitted costs and made corresponding changes to our delivery plans and risk register. Although our revised delivery plans are lower near-term cost, they have less certainty of success, greater risk of overspend and/or higher risk of ODI penalties. These changes should also be seen in the context of the Performance Commitment (PC) challenges that we are accepting – which further increases the cost risks that we are prepared to take on. This compromise position is however contingent on Ofwat accepting the remainder of our updated business plan, as otherwise the plan's balance would be lost, and we would run into financeability issues.

We have also made a number of minor changes to our costs due to new information. We have removed costs due to certain new developed being unlikely to go ahead and added a small amount of cost in relation to metaldehyde and strategic regional water resource schemes.

The following table breaks down the £354m net reduction in our submitted wholesale costs.

Table 2: Total net change in submitted wholesale costs

Change	Reason	Amount
Removal of enhancement costs for upper quartile outcomes performance	For the sake of finding a working compromise with Ofwat	-£300m
Removal of wastewater base costs	For the sake of finding a working compromise with Ofwat (and to ensure base cost efficiency)	-£10m
Removal of costs form bioresources cost adjustment claim	For the sake of finding a working compromise with Ofwat	-£25m
Update of wastewater treatment works growth expenditure	New information	-£21m
Reinstatement of metaldehyde costs	New information	+£1.5m
Additional costs to carry out studies into strategic regional water resource schemes	New information (guidance from Ofwat)	+£0.5m
Total		-£354m

In the rest of this document we set out:

- Significant concerns we have about the way in which Ofwat has implemented its approach to cost assessment.
- The changes we have made to our business plan for the sake of finding a workable compromise solution.
- Minor changes we have made to our business plan due to new information.
- Concerns about the assessment of WINEP costs.
- Further outstanding areas of material disagreement.

As set out in section 4, although we recognise that Ofwat had not fully reflected submitted evidence about our WINEP programme in the DD, we have significant concerns about how our WINEP costs may be assessed by Ofwat at the Final Determination (FD).

Finally, as explained in section 5 of this document, we believe that there are a further five outstanding areas in which we materially disagree with Ofwat. Specifically, these are:

- Frontier shift and RPEs.
- Business rates.
- The effect of treatment complexity on water base costs.
- Traffic Management Act costs.
- Resilience.

In light of our representation and the evidence already submitted throughout the process, we expect Ofwat's view of our efficient costs to change at the FD and align with our updated view of cost efficiency.

1. Significant concerns about Ofwat's implementation of cost assessment

We appreciate Ofwat's general level of transparency in terms of the mechanical calculations of cost allowances – in particular, in relation to botex models. We also appreciated the detailed and extensive industry cost assessment consultations prior to the IAP (including the valuable consultation May 18 ahead of plan submission). However, we have significant concerns about the way in which Ofwat has implemented its cost assessment approach at IAP and DD. These concerns fall into two related categories, as detailed below.

Material and unsubstantiated changes to approach

Since IAP, Ofwat has made significant changes to its cost assessment approach without due consideration, industry consultation, or transparency. Although we agree that Ofwat's IAP approach was not acceptable (because it did not reflect efficient costs), we have significant concerns about the validity and way in which Ofwat has made the changes. Ofwat's changes are often poor solutions to the issues identified (see further details on analytical and evidential standards below). The changes create the risk of inaccurate cost allowances being set, increase regulatory risk and diminish confidence in the process. Ofwat continues to push for lower costs without regard for what levels of service can be achieved with those cost levels.

Specific changes that have led us to these significant concerns include the following:

- **The inclusion of growth expenditure in base.** Despite extensive work on botex models prior to the DD, both by Ofwat and the industry, Ofwat has changed the costs that it assesses within base – specifically, now including growth expenditure. Although Ofwat present a rationale for the change, there is not a detailed quantitative/statistical evaluation of the change or its impact to support its validity. Even without such an evaluation, the fact that the modelling now incorporates growth expenditure but there are no drivers in the models that can reflect differing levels of growth between the companies calls into question the validity of the change. Given the lack of transparency and the time available to us, we have not been able to fully evaluate whether we support the change or not. In the context of a six-week response deadline, this change substantially damages the effectiveness and equity of the overall regulatory process.
- **RPE true-up mechanism.** Whilst we welcome the fact that Ofwat has recognised that labour RPEs are likely to be positive, Ofwat's proposed true-up mechanism is severely underdeveloped for this late stage in the process. For example, no specific index has been named, there is no

analysis of whether a ‘manufacturing wage index’ is an appropriate index, and there is no analysis of whether there is another type of wage index that would be more appropriate. As set out separately in our representation, we caution Ofwat against making decisions about the implementation of a labour true-up mechanism without due consideration.²

- **WINEP efficiency challenge.** Ofwat has changed its approach from imposing individual efficiency challenges on elements of WINEP programmes to an ‘in-the-round’ efficiency challenge applied to companies’ whole programmes. Ofwat provide no justification for why the 9% adjustment is appropriate – and has in fact made a calculation error in arriving at this figure. As set out separately in our representation, Ofwat should remove its efficiency challenge in light of those applied by companies to their own costs.³

In addition to material and unsubstantiated changes that Ofwat has made so far, we recognise that there are still a number of significant areas in which either Ofwat has yet to make a decision or may make significant changes. For example, Ofwat has indicated that it has yet to set out a definitive position on the efficiency challenge for bioresources⁴ and issues relating to developer services.

In addition, and as discussed in section 5 below, Ofwat now has an extra year of cost assessment data to base its FD on, and this could give rise to material changes in cost allowances. We note that, despite indicating to the contrary, Ofwat has not provided the ‘master data’ such that it can be evaluated by companies in time for the representations deadline.⁵

Whilst Ofwat should make material changes to its evaluation of Yorkshire Water’s efficient costs – as we set out in our representation it should do so on the basis of sound logic and empirical evidence. Put another way, Ofwat’s FD should be logically coherent and reflect the most robust evidence.

Poor analytical and evidential standards

Related to the above, we have significant concerns about the analytical standard that the regulator has held its cost modelling approach to. There can only be trust and confidence in the regulatory framework if Ofwat takes an analytically sound approach with visibly robust evidence and clear explanations of interventions made. There is a notable contrast between the clarity of explanations for interventions made at PR14 and those being made at PR19.

Ofwat rightly stresses the importance of companies providing robust evidence but, it too must produce robust evidence and make judgements consistent with robust evidence. Creating an

² See section - Frontier shift and RPEs.

³ See section - WINEP.

⁴ ‘PR19 draft determinations – Securing cost efficiency technical appendix’, Ofwat, July 2019, p27.

⁵ In its written response document to questions raised in the 25th July 2019 cost assessment webinar, Ofwat stated that it ‘aim[s] to publish the updated master data file by 16th August’. It was not published by the time of writing this document – three days before the submission deadline for representations.

evidential asymmetry with different standards for companies and the regulator will greatly undermine confidence in the regulatory approach. We recognise that Ofwat is under political pressure to lower bills, but it cannot disregard sound evidence and adopt poor analytical standards. If it does so, current and future customers, along with the environment, will be harmed and Ofwat will have failed to comply with its statutory obligations under section 2 of the Water Industry Act 1991.

Specific instances in which we believe Ofwat's analytical standards have fallen below the acceptable level of robustness include:

- RPEs and frontier shift - see section - Frontier shift and RPEs.
- WINEP efficiency challenge - see section - WINEP.
- Business rates - see section - Business rates.
- Traffic Management Act - see section - TMA.
- Enhancement opex adjustment - see section - Drinking Water Quality.

In addition to the specific instances noted above, and as we have compellingly evidenced in our IAP resubmission, Ofwat's cost assessment framework is fundamentally flawed in that it does not take into account the relationship between costs and outcomes (performance commitments).⁶ By simple logic, the regulator cannot identify the efficient level of costs without regard for the level of service it is requiring. In spite of this, Ofwat maintains that its performance levels are '*achievable*' under base cost allowances.⁷ This analytical flaw contributes to Ofwat setting an unattainable benchmark, the notionally efficient company as evidenced in further detail elsewhere in our representation (see YKY DD Representation Financeability, Section Financeability and the notional company).

2. Changes we have made to our business plan for the sake of finding a workable solution

There is a £852m gap between the wholesale totex costs in our April 2019 business plan and Ofwat's DD.⁸ Subject to minor updates due to new information and errors, we remain of the view that our previously submitted business plans represent the most robust estimate of the efficient costs that we will have to incur over AMP7 to deliver the outcomes in our plan. Through the PR19 process, we have not received new information or regulatory evidence that has led us to materially change our view of efficient costs.

⁶ See, for example: 'IAP Response YKY.CE.A1: Securing cost efficiency', Yorkshire Water, 2019; and 'Maximising Customer Benefits from the Outcomes Framework, Economic Insight, March 2019.

⁷ See for example 'PR19 draft determinations – Delivering outcomes for customers policy appendix', Ofwat, July 2019, p23.

⁸ As per Ofwat's models: FM_WWW4_ST_DD.xlsx; and FM_WW4_ST_DD.xlsx.

In spite of the above, and with the aim of finding a workable solution with Ofwat, we are prepared to take on additional cost risk and therefore in this representation we submit costs that are closer to Ofwat's view. For the purpose of finding a workable compromise, we have removed £335m from our submitted costs and made corresponding changes to our delivery plans and risk register.⁹ Although our revised delivery plans are lower near-term cost, they have less certainty of success, greater risk of overspend and/or higher risk of ODI penalties. These changes should also be seen in the context of the PC challenges that we are accepting, which further increases the cost risks that we are prepared to take on. Our risk registered has been updated to reflect both these changes in submitted costs and PC targets. This compromise position is however contingent on Ofwat accepting the totality of our updated business plan as otherwise the plan's balance would be compromised, and Yorkshire Water would run into financeability difficulties.

The £335m breaks down as follows:

- We have removed the £300m we had included in our business plan for enhancement expenditure to achieve upper quartile outcomes performance. We maintain our position that upper quartile outcomes performance is not funded by Ofwat's base cost allowances and should be funded through enhancement expenditure.¹⁰ We appear to have reached an impasse on this matter with Ofwat, but for the sake of ensuring that our customers receive the benefit of upper quartile outcomes performance we are prepared to incur those costs even without the necessary cost allowance.
- We have removed £10m from our wastewater base costs. This is to ensure that our 'starting point' is that we are fully efficient in base costs. At the DD, our historical base costs have been judged as within the upper quartile in both water and wastewater. However, in the IAP, our wastewater costs were judged marginally below the upper quartile benchmark. As such, we have made an approximate adjustment of £10m to ensure that our starting point is that of base efficiency.
- We have removed £25m from our bioresources cost adjustment claim.¹¹ This represents the proportion that Ofwat disallowed because it did not accept that there will be a need for us to build additional treatment capacity. We continue to believe the investment will be necessary, but we do not expect we can convince Ofwat of this.

⁹ As detailed in the next section, we have made other changes to our costs based on new information. As such, the total net change in our costs is £354m.

¹⁰ As previously noted, Ofwat's approach is flawed in that it does not connect costs and outcomes. The outcome targets that Ofwat has set are above that which are achievable with base costs, and therefore should be funded through enhancement expenditure allowances.

¹¹ Reference: YKY-BIO701001.

3. Minor changes we have made to our business plan due to new information

In addition to the three important changes explained above, we have made a number of minor changes to our business plan to reflect new information. These consist of the following:

- We have removed £21m of wastewater treatment works growth from our plans due to increased uncertainty regarding the timing, scale and location of new town growth in AMP7.
- The removal of the upper quartile outcomes expenditure from enhancement has meant that we have taken on additional risk. To maximise our chances of delivering customer outcomes without these costs, we have identified the need to change the opex/capex mix within our base costs. £180m has been moved from capital to operating expenditure. Further details are provided in evidence to support an alteration in PAYG rate section of this document.
- We have reinstated £1.495m of costs related to metaldehyde, which were removed at IAP following the recent overturning of the ban. Further details are provided in the metaldehyde costs section of this document.
- We are providing a revised WWn4 data table. This corrects an error we have identified where communal population was excluded from our population equivalent (PE) and load values in our previous submission. Based on internal analysis, we understand that this would change our allowance by less than £15m based on Ofwat's DD approach.
- We have included an additional £0.402m to carry out studies into strategic regional water resource schemes in response to recent guidance from Ofwat.¹² Further details are provided in the strategic regional water resource development section of this document.

4. Concerns about the assessment of WINEP costs

We recognise that in the DD, Ofwat noted it was still considering the evidence we submitted on WINEP. Specifically, Ofwat stated that:

*'We acknowledge additional evidence on WINEP phasing, and the impacts of WINEP on base costs submitted by the company in June 2019. We have not taken this evidence into account when making our draft determination allowances but we will consider this for final determinations.'*¹³

Following the DD, we had a call with Ofwat on 24 July 2019, and subsequently submitted a query YKY-DD-002 which Ofwat responded to.

Despite the above engagement, we still have significant concerns about how Ofwat will assess the efficient costs of our WINEP programme. At the DD, there was a significant discrepancy between

¹² Ofwat provided additional guidance to companies with the draft determination (draft determinations Strategic regional water resource solutions appendix) and wrote to Yorkshire Water in August 2019 highlighting it would be willing to consider requests in this area at final determination.

¹³ 'PR19 draft determinations, Yorkshire Water draft determination', Ofwat, July 2019, p24.

our view of efficient WINEP costs and Ofwat's, and we do not believe that Ofwat's approach appropriately takes into account the drivers of cost differences between companies. Furthermore, Ofwat's 'in-the-round' efficiency adjustment is unnecessary because it does not take account of the significant efficiencies built into our plan. We are concerned that these issues may persist in the FD, and as such we feel it is important for us to represent on the matter.

To address the significant discrepancy between our view of efficient WINEP costs and Ofwat's, and to help Ofwat better assess our costs, we have reclassified £137m of base expenditure to enhancement expenditure. We believe that this change results in a more accurate reflection of the Regulatory Accounting Guidelines. Furthermore, Ofwat should:

- update its modelling approach for p-removal enhancement expenditure to better reflect the drivers of cost differences between companies.
- remove the unnecessary, arbitrary and unjustified 9% efficiency challenge that it has applied to companies' WINEP programmes.
- provide a bespoke allowance for Yorkshire Water to reflect the ongoing capital maintenance costs that are not currently reflected in Ofwat's allowances.

Further details are provided in WINEP section of this document.

5. Further outstanding areas of material disagreement

Before outlining the outstanding material areas in which we still disagree with Ofwat, we first comment on the fact that Ofwat now has an additional year of data to use in its assessment of base costs. From analysis conducted by Oxera for us, we understand the extra year of data materially increases the water and wastewater base allowances given by Ofwat's DD approach for Yorkshire Water (following Ofwat's methodology with no adjustments).¹⁴ As such, it could 'solve' part of discrepancy between our view of efficient costs and Ofwat's. We believe that Ofwat would be remiss if it did not use this additional and more recent data to set its FD allowances – at the very least, it would be inconsistent with its position on WACC. In light of section 1 of this document, Ofwat should carefully consider the analytical integrity of how it reflects this additional data in the FD, it would not be acceptable to simply dismiss it as inconvenient.

Notwithstanding the above, there are several material issues that we believe need to be resolved for Ofwat's FD cost allowances to be acceptable. These are as follows:

¹⁴ Oxera re-ran Ofwat's DD models including the extra year. The resulting cost allowances are materially higher, irrespective of modelling choices such as whether the catch-up adjustment is calculated over the last five or six years. Oxera used the 2018-19 annual performance report (APR) data – which is the same original source as Ofwat's 'master data', but it has not been revised following Ofwat's queries and is not the same finalised dataset that Ofwat will use.

- Frontier shift and RPEs. In relation to frontier shift and RPEs, Ofwat has used assumptions that are unrealistic, that depart from a reasonable evaluation of the evidence, and that are inconsistent with regulatory precedent. Ofwat should adopt an assumption of between 0.4% and 0.8% per annum for frontier shift. All else equal to the DD, this would increase our wholesale base allowance by between £64m and £100m.¹⁵ Ofwat should also provide an allowance for RPEs for all input costs, in line with those submitted in our PR19 business plan. Further details are provided in Frontier shift and RPEs section of this document.
- Business rates. Ofwat's approach to assessing business rates is flawed in a number of respects. For example, it confuses the ability of management or company to influence with the ability to control. Ofwat's flawed approach results in a £34m gap between our views. Ofwat should remove the efficiency challenges that it has imposed and revise its approach to reflect the fact that business rates are taxes. Further details are provided in the Business rates section of this document.
- Effect of treatment complexity on water base costs. We are legally required to deliver a significant enhancement programme for drinking water quality during the 2020-25 period. However, Ofwat's cost assessment modelling approach does not adequately account for the increased treatment complexity that we will need to deliver and, as a result, underestimates the totex allowance in the water networks plus price control. Further details are provided in the Drinking Water Quality section of this document, where we also provide evidence to suggest that the approach to calculating implicit opex allowance is not appropriate.
- Traffic Management Act. Ofwat has applied a 50% efficiency challenge our TMA costs which results in a £22m discrepancy between our views of efficient costs. As we set out in the Traffic Management Act costs section of this document, Ofwat should remove its unjustified efficiency challenge.
- Resilience (Hull). Our business plan includes £28.6m of funding for investments to ensure resilience in Hull and Haltemprice. These investments are required due to the atypical nature of the area and the need to meet the same levels of service we achieve in other parts of Yorkshire. As set out in Hull and Haltemprice section of this document, Ofwat should not consider this expenditure within growth allowances in the botex plus modelling, and instead provide a separate allowance for this expenditure on the grounds of resilience.

In addition to the above, we also note that we are providing a response to Ofwat's action YKY.CE.A2 in our representation. As is detailed in bioresources fixed and variable costs section of this document, our review and presentation of additional evidence has reached the same

¹⁵ Frontier shift is a percentage applied to modelled totex amounts and therefore the change in our allowance will depend on Ofwat's modelling results. Ofwat has an additional year of data for its botex modelling so we expect some change in modelling results.

conclusion as our previous submission as to which costs within the bio-resources revenue control are deemed to be fixed or variable, or indeed a combination of the two. Lastly, we also note that we are submitting updated versions of tables 3.13 and 3.15 of the WINEP technical appendix, as requested by Ofwat. Further details are in provided in the WINEP data tables section of this document.

Water Industry National Environment Programme

1. Overview

Yorkshire Water has a large and complex Water Industry National Environment Programme (WINEP) to deliver in AMP7. This programme will deliver significant environmental benefits that our customers value, and it is required to meet our statutory obligations. We acknowledge that in the DD, Ofwat noted it was still considering the evidence we submitted on WINEP – including clarifications that we provided following our meeting with Ofwat on 20th May 2019. Notwithstanding this, Ofwat's DD underfunds the activities that we will need to undertake to meet our statutory obligations. In particular:

- In our April 2019 business plan, we classified £137m of expenditure related to our WINEP programme as base expenditure, which we do not believe was reflected in Ofwat's DD base expenditure modelling.
- Our business plan also included £755m of enhancement expenditure for our WINEP programme (after Ofwat reallocations). However, Ofwat's draft determination only allows £632m – a gap of £122m.¹⁶
- Furthermore, as evidenced in our IAP response, Ofwat's base expenditure modelling does not take account of increases in ongoing capital maintenance costs due to the increased complexity of our treatment works – and this is not fully included within an implicit allowance.

Our WINEP programme is therefore a significant source of the discrepancy between our view of efficient costs and Ofwat's view. To ensure we are able to deliver important benefits for our customers, we have carefully considered our approach to the scope and cost of our WINEP programme, along with Ofwat's approach to calculating totex allowances. This document sets out: (i) the changes to our plan that we have considered, and those that we have subsequently made; and (ii) deficiencies in Ofwat's modelling approach and an explanation of how it should be improved to ensure our allowances best reflect the true efficient costs that we will incur to meet our statutory obligations.

In relation to changes to our plan that we considered:

- We have reclassified £137.1m of expenditure from base to enhancement. This expenditure relates to the necessary upgrading and replacement of existing assets as a result of our phosphorous removal (p-removal) programme – which is the largest component of our overall WINEP programme. Following engagement with Ofwat on the matter, we believe that this

¹⁶ See Ofwat's enhancement aggregator model 'FM_E_aggregator_ST_DD.xlsx'.

change results in a more accurate reflection of the Regulatory Accounting Guidelines (RAGs). See section 2 for further details.

- We have decided not to re-profile our WINEP programme (an option we previously discussed with Ofwat). We consider it is in customers' best interests to deliver our whole WINEP programme in AMP7 – meaning that customers will experience benefits sooner. See section 3 for further details.

In addition, we are strongly of the view that Ofwat should make the following changes to its cost assessment approach.

- For p-removal enhancement expenditure, the modelling process should be enhanced so that it better reflects the factors that drive cost differences between companies. Ofwat's modelling currently does not take account of either: (i) the different cost implications of statutory obligations resulting from the Urban Waste Water Treatment Directive (UWWTD) and the Water Framework Directive (WFD); or (ii) the change in consent level that companies must comply with.¹⁷ Reflecting these factors in the modelling will allow for more accurate estimates of efficient costs. If Ofwat decide that it is not feasible to change the industry-wide modelling approach at this stage in the process, Yorkshire Water should receive a bespoke adjustment. See section 4 for further details.
- For the total WINEP programme, Ofwat's 9% efficiency challenge should be revised to reflect the robustness of Ofwat's models and the efficiency of companies' planned expenditure. We have applied a rigorous costing approach (evidenced below) and do not consider Ofwat's arbitrary and unjustified adjustment is appropriate. See section 5 for further details.
- A bespoke allowance should be made for the ongoing capital maintenance costs that we will incur for our p-removal enhancement programme. There is no driver in Ofwat's botex models that captures the size of our p-removal programme, and therefore our DD allowances will not reflect the efficient ongoing maintenance cost of our atypically large programme. See section 6 for further details.

2. Reclassification of expenditure from base to enhancement

2.1. Position at draft determination

The largest component of our WINEP programme is that relating to meeting our new and challenging p-removal obligations. In our April 2019 business plan, we included significant costs to build new assets and upgrade existing ones earlier than we would have otherwise done. In the

¹⁷

Consent level refers to the extent of concentration of phosphorous in wastewater.

figure below, we provide an illustrative example of the work required, at one of our sites, to meet our p-removal obligations.

Keighley Marley Sewage Treatment Works (STW) currently has no consent limits related to it.¹⁸ As part of our WINEP programme, it will be required to achieve a consent level of 0.5mg/l for phosphorus (the UWWTD will impose a 2mg/l limit, and the WFD will impose a 0.5mg/l limit). However, if no action is taken, Keighley Marley STW is expected to breach the new limits by 2025.

To meet the new statutory obligations, there is a 'direct' requirement for certain new assets at Keighley Marley STW. For example, these include:

- Pumping assets for dosing and tertiary solids capture.
- Screens and screen handling assets.
- Scraper bridges on Primary Settlement Tanks.

In addition, certain existing assets need to be upgraded at Keighley Marley STW to support the assets with a 'direct' requirement. These include:

- An upgraded generator, and subsequently a larger generator building, to power the new pumping assets.
- Upgrading of other power assets required to meet the needs of the new p-removal assets.
- Upgrading of current primary desludge pumps to RAM desludge pumps.

The new assets and additional upgrades to existing assets would not have been required in AMP7 if it was not for the new p-removal obligations. However, to varying extents, some of the assets would be upgraded in the normal course of our capital maintenance programme. For example, the existing scraper bridges are approaching the end of their useful lives, but without the new p-removal obligations they would not likely be upgraded in AMP7.

Figure 1: Example of work required to meet new p-removal obligations

The above is an example from just one of our sites. Overall, we have new obligations relating to 81 our sites.

Based on our understanding of the RAGs at the time, we apportioned the total cost of our p-removal programme across base expenditure, p-removal enhancement expenditure, and growth enhancement expenditure.¹⁹ The expenditure for the necessary replacement of existing assets was allocated to base expenditure. However, we do not consider that some of the expenditure we included within base expenditure is allowed for in Ofwat's DD modelling – this is not surprising following clarification of the RAGs, as is detailed further below.

¹⁸ This means that there are currently no statutory obligations for Yorkshire Water to achieve specific concentration levels of phosphorous in wastewater from the treatment works.

¹⁹ The approach we took to apportioning is noted in section 3.2 of Appendix 8g (PR19 WINEP technical appendix) of our September 2018 business plan <https://www.yorkshirewater.com/media/1348/appendix-8g-winep-technical-appendix.pdf>.

2.2. Engagement with Ofwat and the decision to reclassify

We engaged with Ofwat on the matter of our WINEP programme and subsequently received additional guidance on the RAGs.²⁰ Following careful consideration, we have decided to reclassify some base expenditure as enhancement expenditure. We now believe that this approach is the most consistent with the RAGs.

In particular, this decision is based on the fact that the RAGs state:

‘Where projects have drivers both of enhancement and capital maintenance, companies should apply a method of proportional allocation to allocate costs between enhancement and capital maintenance.’²¹

Furthermore, guidance provided by Ofwat in relation to the distinction between base and enhancement expenditure states that:

‘Where a new asset required for enhancement purposes is replacing an existing asset either wholly or in part, only the net additional operating costs should be allocated to enhancement.’²²

As we have detailed above, new assets are required for enhancement purposes, and the new assets are replacing existing assets. Therefore, we now believe it is appropriate to apportion the cost of replacing/upgrading existing assets between base and enhancement expenditure. As detailed subsequently, a proportion of the replacement/upgrading expenditure still remains in base expenditure.

2.3. The ‘in principle’ appropriate apportionment

Further to the above extracts, Ofwat also states that:

‘Where an enhancement scheme involves the replacement of existing assets, this will often result in the avoidance of work which would have otherwise been carried out under normal capital maintenance. In such cases, we expect companies to consider the capital maintenance benefit resulting from the provision of the new asset and proportionally allocate capital expenditure between base and enhancement accordingly.’²³

²⁰ Yorkshire Water / Ofwat call on 24th July 2019; query YKY-DD-002 and Ofwat response.

²¹ ‘RAG 4.08 – Guideline for the table definitions in the annual performance report’, Ofwat, March 2019.

²² ‘Base and Enhancement expenditure’, note provided by Ofwat, file dated 2017-11-06.

²³ ‘Base and Enhancement expenditure’, note provided by Ofwat, file dated 2017-11-06.

We therefore consider that expenditure allocated to enhancement should: (i) only include efficient expenditure above that which would be spent above normal base maintenance activities; and (ii) reflect any expenditure that would be avoided by undertaking the enhancement activities. As such, our interpretation is that enhancement expenditure should, in principle, equal:

$$\begin{aligned} & \text{AMP7 efficient expenditure if enhancement activities are undertaken} \\ & \quad \text{minus} \\ & \text{AMP7 efficient expenditure if enhancement activities are not undertaken} \end{aligned}$$

All other efficient expenditure should be allocated to base expenditure.

In the above, 'expenditure' includes all the costs of all relevant assets (both the new and replaced assets). This interpretation takes into account the avoidance of work which would have been carried out if the enhancement did not take place. This is because in the first part of the above equation, any unnecessary/avoided work is not included. This interpretation also only allocates net additional costs to enhancement.

2.4. Our apportionment between base and enhancement expenditure

Our April 2019 business plan costing of our p-removal programme reflected: allocations between types of expenditure; an apportionment between our 'business as usual' base maintenance programme and our p-removal programme; efficiency challenges; and real price effects. To explain how we have arrived at the amount we have now reclassified as enhancement expenditure, we must explain all of these aspects.

The following figure shows how we moved from an initially fully costed p-removal programme at the aggregate level to efficient incremental enhancement and base maintenance expenditures for the programme. As the figure shows, our April 2019 business plan included an incremental amount of base maintenance for our p-removal programme of £137.1m. This is the amount we are reclassifying as enhancement expenditure, as it was calculated in accordance with Ofwat's guidance on the treatment of the replacement of existing assets (as set out above).

The six steps to arriving at this figure are as follows:²⁴

1. We initially costed the capex element of our p-removal programme at £982m. This includes all costs to meet the new p-removal obligations and to accommodate expected growth, including enabling work. The figure is in actual prices as of 2017-18.
2. We subsequently applied a 12.5% efficiency challenge (based on an analysis of recent savings being delivered in AMP6 from direct delivery approaches) – resulting in expenditure of £859m.

²⁴

Further details are subsequently provided in Table 3.

3. As explained in section 2.1, we split the p-removal costs between base expenditure, p-removal enhancement expenditure, and growth enhancement expenditure. This resulted in base expenditure of £247m. The growth elements of the schemes were removed from our calculations of the p-removal programme because we understood they would be accounted for in our wastewater treatment works growth allowance.
4. Recognising the overlap and interdependencies between our ‘business as usual’ base maintenance programme and the base maintenance costed for our p-removal programme, we removed a proportion of base maintenance that is attributable to the p-removal programme. This resulted in £151m being allocated to the p-removal programme for incremental base maintenance. This step is discussed further below.
5. A further efficiency challenge of 13% was applied to the £151m of base maintenance for the p-removal programme – taking it to £132m. This efficiency challenge was based on extensive analysis by experts in the business and consultants working in an advisory capacity and reflects potential savings in relation to asset management and service delivery. It was part of an efficiency challenge applied across our base maintenance programme and reflects different types of efficiency opportunities compared to those in point 2 above.
6. Finally, real price effects were added, resulting in base maintenance expenditure for the p-removal programme of £137m.

Table 2: April 2019 business plan capex costing of our P-removal programme

1. Initial fully costed programme (full design standards, meeting growth specifications and enabling work)	£982m		
2. Initial 12.5% efficiency challenge	£859m		
	Enhancement	Base maintenance	Growth
3. Application of enhancement / base / growth split	£479m	£247m	£133m
4. Identification of incremental base maintenance	£479m	£151m	£0
5. Application of further efficiency challenge	£468m	£132m	£0
6. Application of real price effects	£482m ²⁵	£137m	£0

In relation to step 4, our calculations resulted in only incremental costs being allocated to base maintenance for the p-removal programme. In effect, we subtracted the ‘business as usual’ base maintenance expenditure that would have occurred (absent the enhancement) from what we

²⁵ This is the £482m that is in Ofwat’s p-removal model for capex plus reallocations (FM_E_WWW_p-removal_ST_DD.xlsx, tab ‘Analysis’, cell E37).

classified as base maintenance that is required (given the enhancement). This took into account base maintenance that would have occurred under both scenarios, along with base maintenance that will be avoided by undertaking the enhancement. Therefore, the approach we used to calculate the base maintenance associated with the enhancement programme is consistent with the 'in principle' apportionment approach detailed in the above section.

Given our decision to apportion base maintenance expenditure related to enhancement activities, we have reclassified the £137.1m from base maintenance expenditure to enhancement expenditure. We now believe that this is the approach most consistent with the RAGs, and it will better enable Ofwat to evaluate cost efficiency.

3. The decision not to re-phase our WINEP programme

We previously discussed with Ofwat the potential of re-phasing our WINEP programme, in particular, the possibility of delivering some of our p-removal schemes in 2026, rather than 2025 as originally planned. We discussed this potential option in our meeting with Ofwat on 20 May 2019 and have had various written exchanges with Ofwat on the matter.²⁶ We engaged closely with the Environment Agency in relation to the design and acceptability of the re-phasing option.

The purpose of exploring this option was to reduce customer bills in AMP7 relative to AMP6. That is, by delaying the completion of schemes into the next AMP, we would incur fewer costs in AMP7 and therefore require lower funding in AMP7. Put another way, total enhancement totex for the p-removal programme would have been spread over AMP7 and early AMP8.

However, following careful consideration, we have decided not to re-phase our p-removal programme. This is because we judged that there would be a significant risk of us receiving materially less funding for the p-removal programme if it was re-phased, compared to a scenario of not re-phasing. Furthermore, if our updated business plan is accepted by Ofwat, customers are likely to experience a material bill reduction in AMP7 compared to AMP8, and therefore the need for re-phasing will have fallen away.

This decision was made taking into account the fact that by not re-phasing, customers will receive the full benefit sooner than they otherwise would have done. The Environment Agency was supportive of re-phasing, but its preference was that we deliver the greatest environmental benefit as early as possible. We believe that the decision not to re-phase is in the best interests of customers.

²⁶ For example, we submitted a note to Ofwat following our 20th May meeting and subsequently a query on 30th July 2019.

4. p-removal enhancement modelling

4.1. Position at draft determination

Our April 2019 business plan included £517m of enhancement expenditure for p-removal activities (following net reallocations made by Ofwat). Ofwat's DD approach resulted in a modelled allowance of £484m for p-removal enhancement (prior to its 'in-the-round' WINEP efficiency challenge – as discussed in the next main section of this document).²⁷

Whilst we welcome Ofwat's attempts to improve the accuracy of its p-removal enhancement model since IAP, we do not believe that it accurately estimates efficient costs. Moving from a capex to totex approach and including new consent stringency is a 'step in the right direction'. However, as discussed below, Ofwat's approach does not reflect all the important drivers of relative cost (i.e. differences between companies) and this contributes to the difference between our view and Ofwat's view of efficient costs. As a result, Yorkshire Water is more severely penalised than other companies with smaller WINEP programmes.

We asked Oxera to support us in developing our representation on this matter and we reference its report (Appendix CE1 'WINEP: phosphorous removal', Oxera, August 2019) throughout. This builds on the evidence presented with our IAP resubmission.

4.2. Drivers of relative costs

Important drivers of the relative cost of meeting p-removal obligations set by environmental legislation include the following.

- **Consent level.** The lower the absolute level of consent, the more costly it is to achieve. For example, it is more costly to achieve a consent level of 0.5mg/l than it is to achieve a consent level of 1 mg/l. This is because the technology required to achieve lower consent levels is more costly.
- **Change in consent level.** Enhancement costs reflect step changes from current levels of service. The extent to which consent levels change can vary between companies, and therefore this drives differences in costs between companies. For example, more enhancement expenditure is required to move from a consent level of 2mg/l to 0.5mg/l than it is to move from a consent level of 1 mg/l to 0.5mg/l.
- **Type of obligation.** The type of designation affects what solutions can be applied to achieve the required consent levels. The UWWTD is clear in that consent levels must be achieved by treating

²⁷

Figures taken from Ofwat's p-removal enhancement model 'FM_E_WWW_p-removal_ST_DD.xlsx'.

wastewater before it is discharged.²⁸ Whereas, the WFD applies no such restrictions.

Therefore, less costly technologies (e.g. catchment) can be used to meet WFD obligations compared to UWWTD obligations.²⁹

- **Number and size of sites.** The scale of STWs that are affected by obligations will affect relative costs. Companies with more affected sites, or larger sites, will – all else equal – face greater costs of meeting their obligations.

Whilst Ofwat's approach uses input variables that reflect consent level, number of sites and size of sites, it does not incorporate changes in consent levels or types of obligation. Where companies' obligations differ significantly in these two respects, it cannot be that there is an implicit allowance.

4.3. Implications of the limitations of Ofwat's approach for Yorkshire Water

Yorkshire Water is an outlier in terms of both the mix of type of obligations that we face and the degree of change in the consent levels that we must comply with. As is shown by Oxera's report, and as we summarise below, this results in Ofwat's enhancement modelling underestimating our efficient costs significantly.

Oxera's analysis shows that a much higher proportion of our load is subject to new UWWTD obligations – as illustrated below.

²⁸ For example, the UWWTD states that 'Member States shall ensure that urban waste water entering collecting systems shall before discharge be subject to secondary treatment or an equivalent treatment...'. See <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:01991L0271-20140101&from=EN>.

²⁹ We set out more details on the differences between obligations in section 3.1.1.1 of the cost efficiency appendix to our IAP response, <https://www.yorkshirewater.com/sites/default/files/IAP%20response%20-%20YKY.CE.A1%20Securing%20cost%20efficiency%20REDACTED.pdf>.

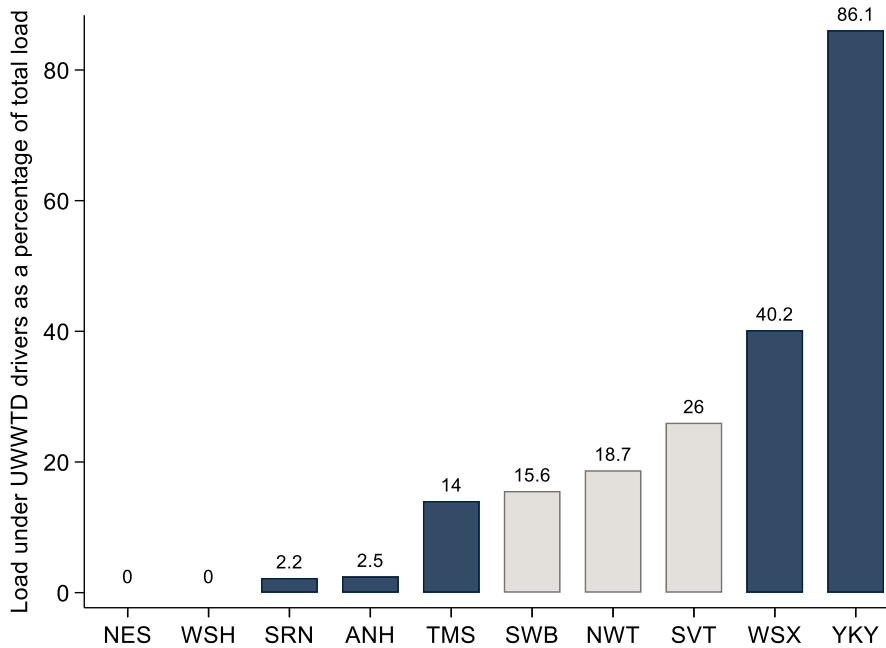


Figure 3: Proportion of load subject to new UWWTD obligations

Source: ‘WINEP: phosphorous removal’, Oxera, August 2019,

As explained above, UWWTD obligations are more costly to comply with because they require an end of pipe solution – rather than a catchment solution, for example. Evidence previously submitted by other companies confirms that end of pipe solutions can be significantly more costly than catchment solutions. For example, Oxera shows that Southern Water is able to save approximately £23m by implementing catchment solutions.³⁰

³⁰ ‘WINEP: phosphorous removal’, Oxera, August 2019, section 3.2.1

Ofwat's modelling is also very sensitive to the inclusion of catchment solutions. As detailed below, United Utilities will apply a catchment solution to one of its largest works – which has a population equivalent of over one million. The inclusion of this single site materially changes the results of Ofwat's modelling.

United Utilities states that it has applied catchment solutions where appropriate. One such case is that of Davyhulme wastewater treatment works (WwTW), which has a population equivalent of over one million. The site does not have a UWWTD obligation, so United Utilities can consider catchment options to achieve compliance in its receiving watercourse (the Manchester Ship canal) without building additional treatment at the site and hence achieve a largely reduced unit rate. The chosen catchment solution will reportedly deliver a net benefit to society that is over 20 times greater than alternative solutions.¹

Given the scale of the population equivalent of Davyhulme, its inclusion in the *Enhancement Feeder Model: P-removal* has a material impact on assumed efficiency of other programmes.

As is shown in Oxera's report, removing the population equivalent associated with Davyhulme WwTW from Ofwat's modelling significantly changes the model results and Yorkshire Water's modelled allowance.¹ This illustrates the effect of companies being to implement less costly solutions compared to Yorkshire Water as well as the sensitivity of the modelling.

Figure 4: Example of significant catchment solution - Davyhulme

The figure below shows that Yorkshire Water also has the second lowest number of existing p-removal obligations. It must therefore be the case that we will often have to implement solutions that ensure a much greater reduction in consent levels compared to other companies.

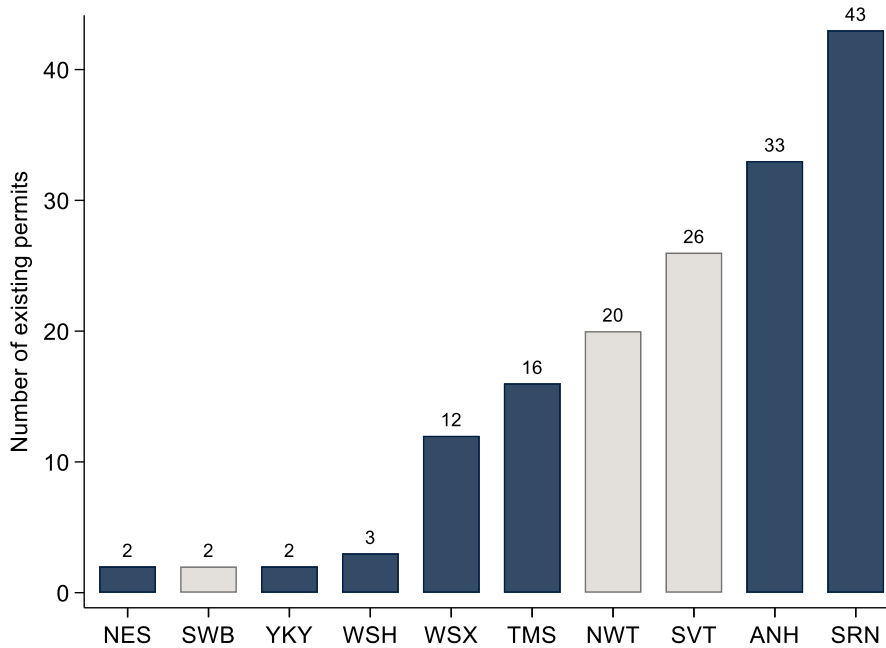


Figure 5: Number of existing p-removal obligations

Source: ‘WINEP: phosphorous removal’, Oxera, August 2019.

Oxera’s report shows that including separate drivers for the population equivalent of sites subject to UWWTD and non-UWWTD obligations would increase our p-removal allowance by £87m.³¹ Oxera has not estimated the effect of including the extent of change in consent level. We do not have industry-wide data on current phosphorus levels, where there are not existing obligations in place – and so it is not possible for us to calculate the extent of change.³²

4.4 Proposed revisions to Ofwat’s approach

As a result of the above, Ofwat should revise its approach to modelling p-removal enhancement expenditure – specifically to take account of the difference in cost of meeting UWWTD obligations compared to WFD designations (as detailed in Oxera’s report) and, if possible, the change in consent level that companies must comply with. We believe that such revisions will improve the accuracy of Ofwat’s estimates – and that these revised estimates will be more in line with our planned expenditure levels.

³¹ This figure is based on a model that incorporates the reallocation described in section 2 of this report and the calculation error in Ofwat’s model, described in section 5 of this report.

³² It is unclear to us as to whether Ofwat has, or could obtain, this data.

If Ofwat decide that it is not feasible to change the industry-wide modelling approach at this stage in the process, Yorkshire Water should receive a bespoke adjustment. Such an adjustment would reflect the more costly mix of type of obligation that we face and the extent of change in consent levels that we must achieve to comply with environmental legislation.

Following the reclassification of expenditure (as described in section 2), our revised business plan includes £648m of enhancement expenditure for p-removal (after Ofwat reallocations at DD). Whereas, Ofwat’s DD approach resulted in a modelled allowance of £484m (prior to its ‘in-the-round’ WINEP efficiency challenge). We believe our view of costs is efficient, and therefore Ofwat’s FD allowance should be similar to our view.

5. WINEP enhancement efficiency challenge

5.1. Position at draft determination

At the draft determination, Ofwat calculated ‘modelled allowances’ for individual enhancement lines related to WINEP and then applied an ‘in-the-round’ efficiency challenge to the sum of modelled allowances. As set out in the table below, our April 2019 business plan included £754m of totex for WINEP enhancements (after Ofwat reallocations), Ofwat’s modelled allowance was £692m and its post-efficiency allowance was £632m.

Table 3: WINEP enhancement expenditure

Enhancements	Totex
Yorkshire Water’s April 2019 business plan (after Ofwat reallocations)	£754m
Ofwat’s draft determination modelled allowance	£692m
Ofwat’s draft determination allowance post-efficiency	£632m

Source: Ofwat’s enhancement aggregator feeder model ‘FM_E_aggregator_ST_DD.xlsx’

As set out below, we disagree with Ofwat’s ‘in-the-round’ efficiency challenge – both ‘in principle’ and how it has been calculated. We consider that this is a further source of the difference between our view and Ofwat’s view of efficient costs.

5.2. No efficiency adjustment required

We disagree ‘in principle’ with the need for a further efficiency adjustment applied to the modelled allowances. As pointed out by Oxera, Ofwat’s enhancement models are less robust than its botex models, but a more extreme efficiency challenge is applied to its enhancement models. Oxera concludes that *‘it is counter-intuitive that less robust models, which have a wider range of efficiency*

scores, *have larger efficiency challenges*'.³³ It is not acceptable that higher challenges are imposed on the basis of much weaker evidence.

Furthermore, we have applied exceedingly stretching efficiency challenges to the costs within our business plan already (see below) – and we understand other companies have done so as well. Whereas the application of broad efficiency challenges could be appropriate theoretically when using historical costs as a benchmark (as has been done in botex modelling), we do not believe it is appropriate when our already stretching future costs are used as a benchmark.

To reiterate how stretching the efficiency challenges we have applied to our business plan are, the figure below describes our costing approach to p-removal – the largest component of our WINEP programme. Notably, it includes multiple significant percentage reductions on our original costs.

Following the UWWTD and WFD designations for phosphorus limits associated with each of our works, we used our Design and Valuation Engine (DAVE) to scope out the additional treatment required at each site to achieve the limits. This generated a list of elements meeting our engineering specifications which we subsequently costed using our unit cost models (UCD), which use historic delivered costs to estimate future requirements.

Following this costing, we applied an initial 12.5% efficiency challenge to reflect use of direct delivery, including the bulk purchase tertiary units by Yorkshire Water and the 'free issue' of those to our delivery partner. The saving also contained an assumption that we would negotiate a new competitive chemical dosing framework. The value of the efficiency savings was based on an analysis of recent savings being delivered in AMP6 from similar direct delivery approaches.

The RAGs were then applied to categorise the expenditure into enhancement, base and growth expenditure, and only incremental base expenditure resulting from the enhancements was kept. As described previously in this document, this base expenditure has been reclassified as enhancement. The growth elements of the schemes were removed because we understood they would be accounted for in our wastewater treatment works growth allowance.

When populating our data tables, we applied a further top down efficiency challenge to our programme – consisting of 2.3% for enhancement elements and 13% to (previously classified) base elements. These efficiency challenges were based on extensive analysis by experts in the business and consultants working in an advisory capacity and reflects potential savings in relation to asset management and service delivery. Examples of the activities that we will be undertaking to realise these efficiencies include investments in our SMART network and greater use of digital technologies.³⁴ Finally, a conservative estimate of real price effects was added.

Figure 6: Our approach to costing our p-removal programme (further details to those given in section 2.4)

³³ 'WINEP: phosphorous removal', Oxera, August 2019, section 3.3

³⁴ Further details can be found in 'Appendix 8f: Wholesale Cost Appendices', Yorkshire Water, September 2018, p120 onwards.

Further details of our stretching approach to costing our WINEP programme are given in our previous submissions. For example, please see:

- Page 43 onwards of ‘Appendix 8f Wholesale Cost Appendices’, which provides details of our overall approach to costing out WINEP programme.³⁵
- Page 23 onwards of ‘Appendix 8g PR19 WINEP Technical Appendix’, which provides further details of our approach to costing our p-removal programme.³⁶

Given the above, we are confident that our planned expenditures are efficient, and we do not think the ‘in-the-round’ efficiency challenge that Ofwat has applied is required to protect customers.

5.3. Incorrect calculation and application of an arbitrary result

Ofwat’s ‘in-the-round’ efficiency challenge applies a 9% reduction to the sum of the ‘modelled allowances’ of individual components of each companies’ WINEP programmes. Aside from our disagreement that any reduction is required, there is an error in Ofwat’s calculation and Ofwat provides no evidence that 9% is an appropriate figure.

Ofwat’s model and its response to a question in the cost efficiency webinar suggests that the 9% is the upper quartile level of efficiency. Ofwat states that:

‘The 9% challenge corresponds to the upper quartile level of efficiency.’³⁷

As Oxera detail, this is, in fact, incorrect. Ofwat has applied a challenge equivalent to the gap between the average and lower-quartile efficient companies – which is an irrelevant result in terms of applying efficiency challenges. Furthermore, the result for Hafren Dyfrdwy is incomparable to those of other companies, and therefore it would not be appropriate to include that result in the calculation.³⁸

In relation to the application of the 9%, in its cost efficiency appendix, Ofwat states that:

‘On reviewing the evidence we consider that a challenge of nine percent is appropriate.’³⁹

³⁵ <https://www.yorkshirewater.com/media/1344/appendix-8f-wholesale-cost-appendices.pdf>

³⁶ <https://www.yorkshirewater.com/media/1348/appendix-8g-winep-technical-appendix.pdf>

³⁷ Cost assessment webinar Q&A, <https://www.ofwat.gov.uk/wp-content/uploads/2019/08/Cost-assessment-webinar-QA-250719.pdf>

³⁸ Ofwat’s modelled WINEP allowance is more than three times what Hafren Dyfrdwy included within its business plan. This is significantly larger than any other gaps between business plans and Ofwat’s modelled costs. The extreme proportional difference is partly due to Hafren Dyfrdwy being significantly smaller than all the other companies (e.g. business plan WINEP enhancement totex of £3m, and the next smallest – South West – has business plan WINEP enhancement totex of £145m).

³⁹ ‘Securing cost efficiency technical appendix’, Ofwat, July 2019, p62.

However, no such evidence is given in support of why it would be appropriate.

Further still, Ofwat states that:

*'This challenge incorporates a catch up element (which we set at a level significantly less stringent than the 'upper quartile') as well as an expectation that companies will make a step-change in efficiency in the coming regulatory period due to the totex and outcomes approach and ongoing productivity improvements.'*⁴⁰

Ofwat therefore suggests that the 9% reflects an expectation that companies will make a step change in efficiency. However, as Ofwat's modelled costs are based on business plan costs (not historical costs), Ofwat has no basis for making a comparison over time. It has not presented any evidence of historical costs, and we believe that business plan costs already reflect very high efficiency challenges.

Ofwat's 'in-the-round' efficiency challenge is therefore an arbitrary adjustment and there is no evidence that it is required to meet Ofwat's objective of achieving a step change in efficiency.

Oxera has calculated a 'corrected' efficiency challenge of 5% (although, as detailed above, we do not believe any in-the-round efficiency challenge is appropriate). It is calculated based on the difference between the average and upper quartile efficient company and treats Severn Trent and Hafren Dyfrdwy as a merged entity – as Ofwat does elsewhere in its calculations.

5.4. Proposed revisions to Ofwat's approach

As a result of no efficiency adjustment being required (as per section 5.2), Ofwat should remove its 'in-the-round' efficiency adjustment. We believe that our costs are efficient and Ofwat has not put forward robust evidence to the contrary (its models are weak and conflate genuine differences in efficient costs with inefficiency).

6. Base expenditure modelling

6.1. Position at draft determination

Ofwat's DD modelling does not take account of the increased costs of ongoing capital maintenance of sewage treatment works resulting from our new p-removal obligations. Ofwat's wastewater botex modelling takes into account the stringency of ammonia consents, but not phosphorus consents. Therefore, Ofwat's base allowances do not reflect the efficient costs that we will have to incur to meet our statutory obligations. No explicit reason or evidence is provided for the inconsistent treatment of cost drivers.

Not only does Ofwat's DD approach underfund Yorkshire Water in AMP7, if a similar approach is taken in PR24, we will continue to be underfunded. Capital maintenance costs in any one year or

⁴⁰ 'Securing cost efficiency technical appendix', Ofwat, July 2019, p62.

AMP for a given asset or small collection of assets are unpredictable and will be ‘lumpy’ over time. As such, totex allowances fund expected costs at aggregate levels. However, if botex models do not include relevant drivers of the capital maintenance costs that will be incurred in the medium to long term, our allowances will not reflect efficient costs.

We made the same argument in our IAP response,⁴¹ and provide updated evidence of the effect of including phosphorus consents in the botex modelling below.

6.2. Effect of including phosphorus consents in botex modelling

Oxera has conducted modelling in which it takes Ofwat’s DD models and includes a driver to take account of p-removal complexity. As is shown in Oxera’s report, reflecting the additional phosphorus obligations that we will face in AMP7 would increase our allowance by £43m.⁴² This figure is additional to that in Ofwat’s DD allowance. Put another way, notwithstanding that there may be a partial implicit allowance within the DD allowance, it would be necessary to add £43m to the allowance to reflect all relevant costs.

6.3. Proposed revisions to Ofwat’s approach

We recognise that changing the botex models yet again may not be reasonable at this point in the price control process. As such, Ofwat should make a bespoke adjustment for Yorkshire Water. It is clear that: (a) this funding is needed – we are building additional assets to meet our statutory obligations and they will require capital maintenance expenditure; and (b) such expenditure is not accounted for in Ofwat’s DD approach. The bespoke allowance should be equal to a minimum of £43m.

7. Recap of conclusions

Our WINEP programme is of the utmost importance to us. It will deliver significant environmental benefits that our customers value, and it is required to meet our statutory obligations. In the DD, Ofwat noted it was still considering the evidence we submitted on WINEP. However, we are concerned that because the DD underfunds our WINEP programme, not representing on this matter could lead to a similar outcome at FD.

To address the significant discrepancy between our view of efficient WINEP costs and Ofwat’s, and to help Ofwat better assess our costs, we have reclassified £137m of base expenditure to enhancement expenditure. We believe that this change results in a more accurate reflection of the Regulatory Accounting Guidelines. Furthermore, Ofwat should:

- update its modelling approach for p-removal enhancement expenditure to better reflect the drivers of cost differences between companies;

⁴¹ See section 3.1.2 of ‘IAP Response YKY.CE.A1: Securing cost efficiency’, Yorkshire Water, 2019; along with ‘Ofwat’s enhancement modelling approaches at the IAP: a review’, Oxera, March 2019.

⁴² ‘WINEP: phosphorous removal’, Oxera, August 2019

-
- remove the unnecessary, arbitrary and unjustified 9% efficiency challenge that it has applied to companies' WINEP programmes; and
 - provide a bespoke allowance for Yorkshire Water to reflect the ongoing capital maintenance costs that are not currently reflected in Ofwat's allowances.

WINEP data tables

Ofwat feedback

'The company has addressed all the actions apart from submitting a corrected version of Table 3.13. (A corrected version of Table 3.15 is also required.) However, the answers provided highlight some inconsistencies which will need to be addressed prior to the final determination. In particular the information provided raises questions about the extent to which the company has taken account of the changes in the scope of the Amber programme in the latest release of WINEP (March 2019).'

Our response

We have reviewed and updated tables 3.13 and 3.15 of Appendix 8g PR19 WINEP Technical Appendix. The updated versions are below.

Table 4 – Updated Table 3.13 of Appendix 8g PR19 WINEP Technical Appendix

Fish Passage (WFD_IMP_FISH)	EA-WINEP3ID	Cost (£)	LORI (km)	Unit cost (£ per km)
Farnley Beck Fish Passage	YOR00123	88,320	3.29	26,845
Aire Banks Mill Fish Passage	YOR00115	101,888	4.5	22,642
Cononley Weir Fish Passage	YOR00122	1,038,606	45.54	22,806
Cheesebottom Weir Fish Passage	YOR00116	1,249,631	9.5	131,540
Watson Mill Fish Passage	YOR00125	55,275	0.94	58,804
Total (and median unit cost)		2,533,721	63.77	39,732

Table 5– Updated Table 3.15 of Appendix 8g PR19 WINEP Technical Appendix

Heavily modified water bodies (HMWB) (WFD_IMP WRHMWB)	EA-WINEP3ID	Cost (£)	LORI (km)	Unit cost (£ per km)
Winscar Catchment Scheme	YOR00029	521,612	11.25	46,366
Little Don Catchment Scheme	YOR00025	590,255	3.05	193,526
Agden River Restoration Scheme	YOR00033	214,103	0.44	486,599
Grimwith Sediment Scheme	YOR00112	338,959	5.11	66,332
River Burn Catchment Scheme	YOR00042, YOR00044, YOR00045	1,747,417	20.05	87,153
Schole Hill Fish Passage	YOR00124	45,871	0.78	58,809
Total (and median unit cost)		3,458,217	40.68	85,010

Frontier shift and real price effects

Overview

One area in which there is significant disagreement between us and Ofwat is that of frontier shift and real price effects (RPEs). At both the initial assessment of plans (IAP) and the draft determination, Ofwat has used assumptions that are unrealistic, that depart from any reasonable evaluation of the evidence, and that are inconsistent with regulatory precedent. Ofwat's assumptions contribute to an unachievable efficiency benchmark for Yorkshire Water and other companies.

In the sections below, we set out our position on frontier shift and RPEs, in light of the draft determination. In summary:

- We disagree with Ofwat's frontier shift assumption of 1.5% per annum. As per our IAP response, Ofwat should adopt an assumption of between 0.4% and 0.8% per annum. All else equal to the DD, this would increase our wholesale base allowance by between £64m and £100m.⁴³
- We welcome Ofwat's partial recognition of labour RPEs but, disagree that no allowance should be made for other cost categories. We consider that an allowance should be made for all input costs and we stand by the RPEs included within our business plan and the evidence we presented to support that position.
- Whilst we acknowledge the potential merits of a true-up mechanism for RPEs, the benefits would only be realised if the mechanism was based on a robust foundation. We are concerned that such a late change in the regulatory framework would not meet its objectives. Specifically, we are concerned that basing this mechanism on a (yet to be specified) manufacturing index may be inappropriate, putting undue risk on customers and generating potential windfall gains or losses for companies.

Consistent with the poor analytical and evidential standards that Ofwat has held itself to in PR19, companies submitted multiple and lengthy reports on these matters in their responses to the IAP.⁴⁴ Given the coverage that these issues have already received, in this document we do not repeat all the evidence that has already been presented. Rather, we focus on replying to Ofwat's DD counterclaims related to the more substantive issues, along with issues that Ofwat did not address in the draft determination.

⁴³ Frontier shift is a percentage applied to modelled totex amounts and therefore the change in our allowance will depend on Ofwat's modelling results. Ofwat has an additional year of data for its totex modelling so we expect some change in modelling results.

⁴⁴ For example, Ofwat's cost efficiency technical appendix references six consultancy reports submitted by companies on frontier shift.

We asked Economic Insight to write a reply to the arguments Ofwat has put forward in relation to frontier shift. Please see Appendix CE2 'Frontier shift – A brief response to the new points raised by Europe Economics and Ofwat', Economic Insight, August 2019, we also refer to it subsequently in this document. Economic Insight finds that Ofwat's arguments do not, in fact, address the analytical criticisms of Ofwat's extreme position.

Frontier shift

At both the IAP and draft determination, Ofwat has applied a frontier shift assumption of 1.5% per annum. According to Ofwat, this is intended to reflect: ongoing improvements to the in the wider economy ('economy-wide shift'); and one-off efficiency improvements from the move to a totex framework ('totex-shift'). Below, we set out three of the most substantive arguments that have not been properly addressed by Ofwat. Where possible, we provide further evidence and replies to Ofwat's latest evidence.

Too little weight is placed on the latest evidence

UK productivity has recently flatlined, and this trend is widely expected to continue in the near-term. Despite this, Ofwat's frontier shift assumption implies significantly higher levels of productivity growth than in recent historical periods.

The figure below, from a previously submitted report by Economic Insight, shows the flatlining of the UK economy. Specifically, between 2008 and 2015, labour productivity averaged just 0.1% per annum and total factor productivity (TFP) averaged -0.3% per annum.⁴⁵

⁴⁵

'The scope for frontier shift at PR19 – A report for Yorkshire Water', Economic Insight, February 2018.

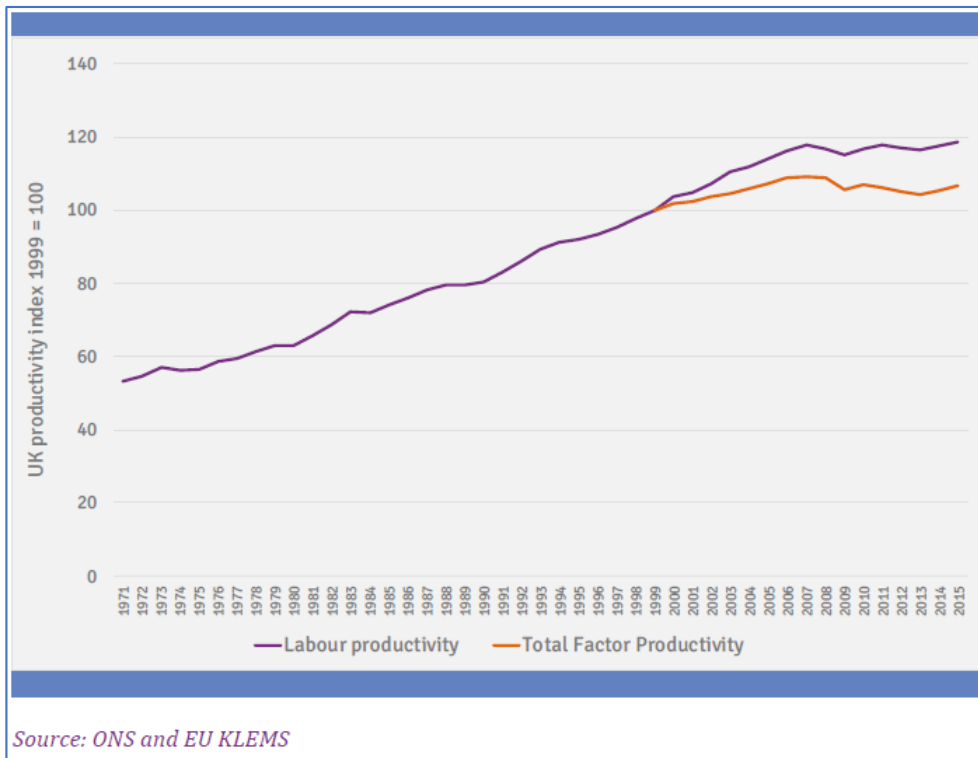


Figure 7: UK productivity levels – annual index

The Economic Insight report also shows that the likes of the OBR and the IMF expect productivity growth to remain low in the near-term. This is also consistent with the very latest evidence – not available at the time of the DD – from the Bank of England, which is forecasting productivity growth in 2020 and 2021 of less than half the average experienced over 1998-2007 – as shown below.

Table 6: Bank of England productivity forecasts (from August 2019 Inflation Report)⁴⁶

	Average 1998-2007	2019	2020	2021
Productivity (GDP per hour worked)	2.25%	-0.25%	1%	1%

Furthermore, the Bank of England stated that:

‘Much of the weakness relative to pre-crisis norms reflects a judgement that potential productivity will grow more slowly. Potential productivity growth is also likely to be affected by the prolonged period of uncertainty and weaker investment associated with the Brexit process.’⁴⁷

⁴⁶ ‘Inflation Report’, Bank of England, August 2019, p33. <https://www.bankofengland.co.uk/-/media/boe/files/inflation-report/2019/august/inflation-report-august-2019.pdf>

⁴⁷ Ibid, p34.

Indeed, even under the assumption of an ‘orderly Brexit’, the prospects for productivity growth remain limited. For example, in February 2019, the Bank of England stated that:

‘Changes in trading arrangements as a result of Brexit are also likely to weigh on the outlook for productivity, even under the assumption of a smooth adjustment to those new arrangements.’

In dismissing our argument in the draft determination, Ofwat stated that:

‘Overall we consider that Europe Economics forecasts of frontier shift are based on an appropriate time period as they consider growth over more recent years and the longer term.’

Whilst we do not argue that Ofwat’s position is based on both longer term and more recent evidence, we disagree with the amount of weight that has been placed on more recent evidence. The evidence of a continued plateau in productivity continues to mount, and we cannot see how Ofwat’s assumption is consistent with the low productivity environment we are currently in, especially in light of the more recent forecasts mentioned above. Given the assumptions of efficiency savings that Ofwat applies in other parts of its cost assessment process, this creates a material risk of double-counting of the achievable savings.

Ofwat’s frontier shift assumption is inconsistent with other aspects of the framework

First, Ofwat has assumed that relatively high levels of productivity will occur for the purposes of setting frontier shift, however, its view of the appropriate WACC is premised of a view of relatively low productivity. For example, Ofwat stated in one of its methodology documents that (emphasis added):

‘The latest medium-term forecasts for the UK economy support the view that prospects for future growth will remain weak, decreasing the probability that interest rates and returns will normalise to the higher rates seen in the last few decades. In November, The Office for Budget Responsibility downgraded its growth forecasts from its March 2017 publication. This was due to **persistent weakness in productivity growth** and its view that **this phenomenon will continue at least until 2022.**’⁴⁸

Second, we previously showed that there is a similar inconsistency between high frontier shift and zero RPEs.⁴⁹ As addressed in the next main section of this document, we welcome Ofwat’s move to allow RPEs for labour, but we strongly disagree that it wholly ‘addresses concerns raised by respondents about inconsistency between [our] frontier shift and real price effect assumptions’ – as Ofwat appears to suggest.⁵⁰

⁴⁸ ‘Delivering Water 2020: Our methodology for the 2019 price review Appendix 12: Aligning risk and return’, Ofwat, 2018, page 27.

⁴⁹ See, for example, ‘IAP Response YKY.CE.A1: Securing cost efficiency’, Yorkshire Water, p11.

⁵⁰ ‘Securing cost efficiency technical appendix’, Ofwat, July 2019, p28.

Third, a further inconsistency arises in that the productivity measures that Ofwat’s frontier shift assumptions are based on reflect the combined impact of improved quality and lower costs . That is, they are a measure of the value of outputs given inputs. Despite this, Ofwat expects the efficient company to be able to make 1.5% cost reductions each year and at the same time achieve significant outcomes improvements.

Put another way, even if despite the clear evidence to the contrary, the 1.5% was temporarily viewed an appropriate measure of the productivity improvements that could be made, it could either result in a 1.5% reduction in costs or a 1.5% improvement in the value of outputs, or a combination of the two (e.g. 0.75% reduction in costs and 0.75% improvement in the value of outputs). This trade-off between costs and outcomes is illustrated below. As can be seen, if the ‘whole’ 1.5% is applied to costs, the only efficient outcome is zero improvement in the value of outcomes.

Table 7: Illustration of cost and outcome improvements relate to efficiency changes

		Cost improvement		
		1.5%	0.75%	0%
Outcomes improvement	1.5%	3%	2.25%	1.5%
	0.75%	2.25%	1.5%	0.75%
	0%	1.5%	0.75%	0%

Note: red indicates an impossible outcome; green an efficient outcome; grey an inefficient outcome.

As we have pointed out before and elsewhere in our representation, Ofwat’s framework completely fails to connect costs and outcomes. Frontier shift is one aspect of the framework in which this failure is manifested.

Adding economy-wide shift to totex-shift amount to double counting

We previously argued that adding the economy-wide shift to the totex-shift amount to double counting and we are still of this view. Please see Economic Insight’s report, which replies to the counterarguments put forward by Ofwat and Europe Economics.⁵¹ In summary:

- Ofwat’s and its consultant’s analysis assumes that 100% of the cost outperformance in the ‘totex and outcomes’ price controls studied are entirely attributable to the impact of Ofgem’s totex and outcomes framework.⁵² This cannot be true as cost outperformance is also driven by factors

⁵¹ ‘Frontier shift – A brief response to the new points raised by Europe Economics and Ofwat’, Economic Insight, August 2019.

⁵² The analysis relies on evidence from the energy sector.

such as forecasting errors and aspects of the framework that would have existed 'but for' the totex and outcomes elements.

- Ofwat's position is further premised on a range of other assumptions, such as that any temporary period of faster productivity gains has not already finished and that it will last until the end of 2025. No evidence is provided to support these assumptions.

Our position

Ofwat should consider the coherence of the range of assumptions it has made throughout its framework, along with its evaluation of the evidence on frontier shift. We do not believe that Ofwat has reasonably evaluated the evidence available to it.

As per our position in our IAP response, Ofwat should adopt a frontier shift assumption within the range of 0.4% to 0.8% per annum.⁵³ All else equal to the DD, this would increase our wholesale base allowance by between £64m and £100m.

Real price effects

At the IAP, Ofwat did not make an allowance for RPEs. However, in the DD, Ofwat has included an allowance for labour RPEs and suggested a true-up mechanism based on a (yet to be specified) manufacturing index. We address ex-ante allowances and ex-post adjustments in turn below, before summarising our position.

Ex-ante allowance

Ofwat's position on RPEs, in the IAP and DD, was informed by work conducted by Europe Economics. The updates that Europe Economics made to its approach for the DD result in the critical test being whether the expected wedge between the input price and CPIH is materially different from zero – its 'test 3a'. The update also reflects independent forecasts that were not previously available, along with a wider range of indices.

Below, we provide an assessment of the updated evidence related to test 3a, for different types of costs.

Labour and energy

For energy and labour, Europe Economics changed its overall conclusion from 'fail' to 'it depends' by recognising that whether test 3a is passed depends on which dataset / time period is used to reach the conclusion. This is why Europe Economics then goes on to consider whether an RPE is required for labour and energy costs.

⁵³ 'YKY.CE.A1: Securing cost efficiency', Yorkshire Water, 2019, p14.

- Although Europe Economics concludes that there may be a case for an ex-ante RPE for energy as well as labour, it seems to suggest that the case is weaker for energy than for labour for various reasons, which Ofwat then echoes in its technical appendix.⁵⁴ We note that the main differences between labour and energy costs that seem to explain why Ofwat’s view is that the case is weaker for energy are:
 - (a) energy costs make up a smaller proportion of company totex (9.4%).
 - (b) energy costs make up approximately 5% of CPIH.
 - Our conclusion is that these differences are not good reasons not to use an RPE for energy.
 - Point (a) effectively reintroduces the materiality criterion (test 1), which Europe Economics (rightly) removed from its assessment framework.
 - Point (b) implies that – other things equal (unlikely) – a 5% increase in energy costs would cause CPIH to increase by around 0.25% (5% x 5%), whereas a water company’s costs would increase by almost double this amount 0.47% (5% x 9.4%).
- Furthermore, several of the reasons put forward by Ofwat/Europe Economics apply equally to labour costs (e.g. uncertain forecasts) – and therefore do not explain why their view is that the case is weaker for energy.

Therefore, our view is that to the extent that an RPE is applied to labour costs, it should also be applied to energy costs.

Chemicals

As at the IAP stage, Europe Economics finds:

‘Overall, placing most weight on the historical wedge analysis, we believe that the evidence suggests that there is no material real price effect in expectation for chemicals.’⁵⁵

Europe Economics has reached this conclusion primarily on the basis that the historic gap between ‘Chemicals and Chemical Products’ PPI (published by the ONS) and CPIH is not ‘*statistically significant from zero*’.⁵⁶ But, as has been previously argued, a statistical significance test does not in fact test whether ‘*the expected value of the wedge...is materially different from zero?*’.⁵⁷ Also,

⁵⁴ Europe Economics (2019), page 39; Ofwat (2019), ‘Securing cost efficiency technical appendix’, page 143.

⁵⁵ Europe Economics (2019), ‘Real Price Effects and Frontier Shift – Updated Assessment’ page 41.

⁵⁶ Europe Economics (2019), *ibid*, page 41.

⁵⁷ Economic Insight (2018), ‘The scope for frontier shift and real price effects at PR19’, page 22.

the Chemicals and Chemicals Products PPI reflects a broader mix of chemicals to those used by water companies and so is not necessarily an appropriate index to use.

Instead, the conclusion we have previously reached and maintain, which is based on several detailed analyses using a wide range of forecasting techniques and reflecting Yorkshire Water's mix of chemical costs is that chemicals input price inflation could be between 2.76% per annum to 5.43% per annum i.e. a significant positive wedge over forecast CPIH.⁵⁸

Therefore, we remain of the view that Europe Economics has incorrectly concluded that chemicals fails test 3a.

Materials, plant and equipment

Europe Economics finds:

*'On balance, given this mixed evidence, we do not believe there is a robust case for a material real price effect.'*⁵⁹

Europe Economics compares CPIH to six indices (the same indices as in its IAP report):

- For three out of the six indices, Europe Economics finds that there is a '*statistically significant positive wedge*' of between 1.1% and 1.4% (up from 0.7% to 1.4% from its IAP report).⁶⁰
- For three out of the six indices, Europe Economics does not find a statistically significant wedge. The report (still) does not say whether the wedge is positive, zero or negative (this position is the same as in their IAP report).⁶¹

It has also added a handful of comparisons to various PPI indices which show declines in prices, but there is no discussion of why those indices have been selected or how they relate to the mix of materials used by water companies.⁶²

Therefore, as we have previously argued, we consider that the evidence relied on by Europe Economics if anything suggests a positive real price effect for materials, plant and equipment. This is consistent with evidence we have previously submitted which suggests that capital cost inflation could be between 2.31% and 3.59% per annum i.e. a significant positive wedge over forecast CPIH.⁶³

⁵⁸ Economic Insight (2018), 'Inflation Forecasting: Real Price Effects and Input Price Inflation at PR19'.

⁵⁹ Europe Economics (2019), *Ibid*, page 45.

⁶⁰ Europe Economics (2019), *Ibid*, page 44.

⁶¹ Europe Economics (2019), *Ibid*, page 44.

⁶² Europe Economics (2019), *Ibid*, page 45.

⁶³ Economic Insight (2018), 'The scope for frontier shift and real price effects at PR19', page 22.

Ex-post adjustment

We recognise the in-principle benefits of a true-up mechanism. However, the mechanism for labour RPEs that Ofwat has put forward is severely underdeveloped. We note that:

- There is one page of analysis in Appendix 1 of the Europe Economics report⁶⁴ and a sentence in Ofwat's technical appendix where it asserts that '*Manufacturing and water sector labour markets have similarities and often involve similar skills and expertise*'.⁶⁵ There is no analysis of:
 - whether this assertion is, in fact, correct or based on robust evidence.
 - even if it is, whether the alleged historic correlation between the manufacturing wage inflation and water wage inflation is caused by similar changes in similar labour supply and demand conditions or could be spurious.
 - how big the gap between manufacturing and water supply wage inflation has been historically and so whether the level of the index is appropriate.
 - whether any such alleged correlation is expected to continue in view of Brexit.
- Relatedly, there is no analysis of whether another index that better reflects the labour mix used by water companies would be better to use than a manufacturing wage index.

As at any stage in the price control process, it is in the best interests of customers for framework decisions to be rigorously evaluated. However, there is a clear and present danger that, due to the current underdevelopment of this mechanism, the index that is subsequently selected may be inappropriate putting undue risk on customers and generating potential windfall gains or losses for companies. Further to this, Ofwat should carefully consider how this mechanism would affect the incentives of companies to minimise costs and the overall risk-reward package.

Our position

Based on the above, our position on RPEs is as follows:

- We remain confident that the RPEs submitted in our business plan are required and based on robust evidence. In addition to an allowance for labour, Ofwat should provide an allowance for the other cost categories as well.
- We caution against Ofwat making decisions about the implementation of a labour true-up mechanism without due consideration. Whilst we will always remain open to working with Ofwat on such matters, with the limited time given to us we are not able to provide clear views about

⁶⁴ Europe Economics (2019), *Ibid*, Appendix 1.

⁶⁵ Ofwat (2019), 'Securing cost efficiency technical appendix', page 143.

the design of a labour wage true-up mechanism given the lack of information in the DD. If a mechanism is applied, it must not put undue risk on customers or generate the potential for windfall gains or losses for companies.

Business rates

The path to the draft determination

Ofwat signalled in section 7.1.2 of the final methodology that it was concerned to ensure that companies were incentivised to manage their business rates efficiently and engage effectively with the Valuation Office agency. The current view in the final methodology was that business rates should not be a notified item for PR19 and that a true-up mechanism was not favoured since it would not provide the desired incentives.

At IAP, business rates were assessed through an unmodelled adjustment. The results of the Ofwat approach created a 6% (£10m) challenge on clean water rates and a 21% (£23m) challenge on wastewater rates. Our IAP resubmission provided substantial evidence as to why we believed that the Ofwat approach was flawed and had reached inappropriate conclusions.

The position set out in the draft determination shows no changes from the IAP. Much of the text in the cost appendix is repeated verbatim from the IAP documents, and the only visible change is the inclusion of some additional narrative regarding the frequency of revaluations and Ofwat's expectation of how transitional relief will apply. This expectation appears to be contrary to the current Transitional Relief scheme implemented from 2017. Ofwat also restates its belief that companies have some 'control' over the level of business rates paid, a view for which no evidence is advanced and indeed flies in the face of the established system for setting business rates in the UK and all regulatory precedent.

Disappointingly, there is no visible engagement with the evidence provided in the IAP resubmission beyond an overarching comment that Ofwat does not consider there is compelling evidence to change approach. Ofwat does however invite the submission of evidence with the representations on the draft determination.

Manifest flaws in the approach that Ofwat has used

We remain strongly of the view that the approach Ofwat has used is flawed and that there is clear and compelling evidence of this. In the sub-sections below, we evidence four specific flaws with the implementation of the intended approach and the evidence that supports our position:

- Ofwat's approach confuses the ability of management or company to influence with the ability to control. Ofwat fail to recognise that most key elements at the 2021 Revaluation are beyond company control because they are statutory functions in the hands of an external Government agency.
- Ofwat has paid insufficient attention to regulatory precedent and the lessons therein.
- Ofwat's approach on water directly penalises the very behaviours that it is seeking to incentivise.

- Ofwat’s decision not to take into account the impact of increases in the wastewater asset stock has no basis and is akin to encouraging tax avoidance.

We also go on to highlight below that we believe that Ofwat’s overall approach is flawed since it treats business rates as a cost whereas they are in fact a tax.

Ofwat confuse management or company influence with control

We do not dispute that a company can exert a degree of *influence* over the rates bill. This is precisely why we have a dedicated team who are members of the Royal Institution of Chartered Surveyors and the Institute of Revenues, Rating and Valuation to lead our mitigation plan. The team actively engages with the Valuation Office Agency (VOA) and participates in government consultations. We believe that Yorkshire Water is the only company staffed in this way. Using an internal team maximises the impact of expert advice, for example by including those experts as part of investment decisions to help reduce future rates liabilities. Section 1.7.2 of our IAP submission on costs provided a more detailed explanation of their work.

The team’s professional skills were evident in the 2017 Revaluation of the Clean Water rating assessment, through negotiation, moving from the initial Valuation Office Agency ‘Trial valuation’ in October 2015 of RV£124.4m, to a formal Draft List figure of RV£84.38m and then to the current RV£80.0m. The forecast for the 2021 Revaluation is based on the same methodology as that agreed in 2017, where we have taken a ‘realistic but not worst’ case scenario in modelling the variables on the expectation of a similar level of positive engagement with the VOA.

While our team have been successful in exerting *influence* over the rates bill, this does not mean that we can exercise *control*. The rates bill that arises is the product of a defined process followed by the VOA that relies on several external inputs over which the company has no influence.

The Revaluations of 2021 and 2024 will be led by HMRC Valuation Office Agency (VOA) and is independent of the price determination. Several of the principal valuation steps and key variables are decided by others. Figure 8 below outlines the principal valuation steps and the key elements therein. As the colour-coding shows, most are decided by others. Each of the annual multiplier, the transitional relief scheme (for both clean and waste) and decapitalisation rate (for waste) are specified by government. Construction prices (for waste) are dictated by market forces.

RATES REVALUATION SCHEMATIC SUMMARY OF ELEMENTS/VARIABLES WITHIN EACH AND STEPS.

Property asset type:

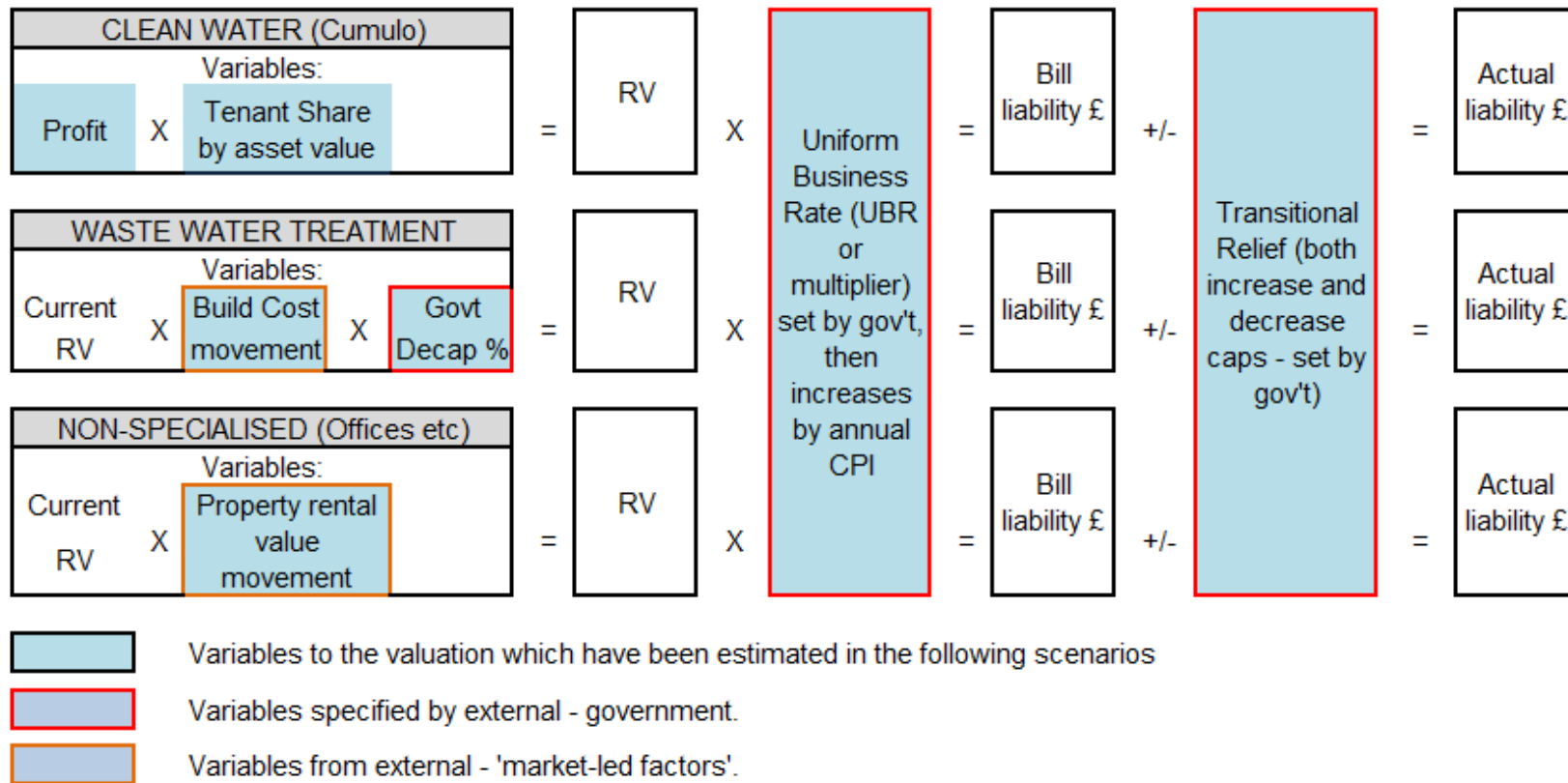


Figure 8 – Principal valuation steps and key elements

The valuations prepared by the VOA will be set, leaving the company as ratepayer to check and challenge the assessment figures, with any appeal taking a year or more to conclude.

We also note that Ofwat's view that the company has some 'control' runs counter to the views expressed by Ofwat at PR14⁶⁶. Ofwat has not provided any explanation or evidence as to why its views have changed.

Ofwat has paid insufficient attention to regulatory precedent

Section 3.2.4 of the evidence prepared for us by Oxera for our IAP resubmission⁶⁷ highlights the clear inconsistencies between Ofwat's approach and those in other UK and European regulated industries. It is evident that other regulators recognise that rates are outside of company control, as is the case with the imposition of any tax.

Given the weight of counter views, it is especially grave that Ofwat has provided no evidence to support its decision not to follow such clear precedents.

Ofwat's approach on water directly penalises the behaviours that they are seeking to incentivise.

In section 1.7.3 of our IAP resubmission response, we highlighted that in May 2018, we gained agreement to a time limited reduction of circa £2m per annum in the tenants share water valuation until the next revaluation in 2021. Annex 1 provides summary details of the correspondence with the VOA confirming this agreement.

Ofwat has based the starting point for the draft determination on clean water rates on the figures including this reduction. However, the approach does not recognise that this reduction is time limited. Missing the inevitable increase when this adjustment ends explains the majority of the £10m Ofwat cost challenge on water rates.

The overall effect of this flaw is that by successfully adopting the very behaviours that Ofwat is seeking to incentivise, we are being penalised. Had we not gained agreement to this time limited reduction, our allowance for business rates in the determination would have been higher. We presume that this is an unintended consequence of Ofwat's method and so there is a clear case for this to be corrected by removing the £10m cost challenge.

Ofwat's decision not to take into account the impact of increases in the wastewater asset stock has no basis

We are especially concerned by the approach taken by Ofwat regarding changes in the wastewater asset stock. The construction of new assets is a fact and is supported by the evidence in the

⁶⁶ YKY.CE.A1-4, Oxera, Ofwat's enhancement modelling approaches at the IAP a review. Page 4, Section A7.3.1

⁶⁷ YKY.CE.A1-4, Oxera, Ofwat's enhancement modelling approaches at the IAP a review. Section 3.2.4

2018/19 Annual Performance Report. Annex 2 details the current period asset extensions and those expected in the following and current period to April 2020.

The use of a 2017/18 base year fails to recognise the impact of the changes in asset stock during the current period. The omission of these assets results in an under-statement of the actual rates liability of circa £1.3m per annum. This flaw is compounded by failing to recognise the future increases in wastewater asset stock that will occur in the 2020-25 period, which is illogical and unjustifiable.

We can see no basis to not include the changes in asset stock. Failure to do so would also have unintended consequences, as it is akin to ‘hiding’ the assets from the valuation process and would be dangerously close to tax avoidance. We also note that United Utilities seems to have received an adjustment to their 17/18 base figure for ‘assets.....not yet valued’ and so not in payment liability⁶⁸. We note that Ofwat’s modelling of wastewater base costs at IAP found only a very small degree of catch-up efficiency on our wastewater costs. This appears to have provided inconsistent treatment between companies.

Ofwat’s overall approach is flawed since it treats business rates as a cost whereas they are in fact a tax

We believe that the evidence presented in section 2) demonstrates clearly that Ofwat’s approach is flawed and that the challenges imposed at IAP (and sustained in the draft determination) should be removed. In addition, there is also a more fundamental consideration which Ofwat must take into account.

Ofwat’s approach appears to view business rates as a cost rather than a tax, hence the language of efficiency challenge. However, business rates are a tax, and so the approach taken should reflect this.

We note that Ofwat appears to have taken a different approach regarding taxation in its thinking on the sharing of financial outperformance. In section 6.3.2 of its position statement on restoring sector balance, Ofwat cites Green Book advice that ‘tax be excluded from the overall monetised estimate of a policy’s value because it is a transfer payment where costs are offset exactly by benefits.’

Consistent application of this Green Book advice in the context of business rates should mean that Ofwat becomes much less concerned with creating efficiencies and seeking to reduce the tax paid.

⁶⁸ OFWAT ‘BRates – Input’ tab:

Manual adjustments to BR allowances

Company code	Companyname/financial year	WW	WWW
ANH	Anglian Water		
HDD	Hafren Dyfrdwy		
NES	Northumbrian Water		
NWT	United Utilities Water		3.54
SRN	Southern Water		
SVE	Severn Trent England		

Added £3.54m to allowance as per response to UJW_IAP_CA_019 to take account of WW assets accruing BR liabilities not yet valued.

Ofwat is already proposing to introduce a true-up mechanism for other aspects of taxation, and the obvious solution to help manage the uncertainties over the future path of business rates is to introduce some form of similar mechanism here. Ofwat's methodology noted a desire to incentivise companies to manage business rates efficiently and engage effectively with the VOA. Full pass through to customers would not create such incentives but a true-up of the AMP7 rates liability based on 50/50 sharing would do so.

Of course, such a mechanism would only be appropriate if there were full confidence in the basis of the projected baseline against which the true-up subsequently occurs. The manifest flaws in Ofwat's approach detailed above would need to be corrected before such a mechanism could possibly work.

Drinking water quality

Overview

We are legally required to deliver a significant enhancement programme for drinking water quality during the 2020-25 period. Regulation 28 Notices from the Drinking Water Inspectorate set out the defined solutions (building new, advanced treatment processes) needed to address deterioration of incoming raw water and taste and odour risks at six large water treatment works.

The need for this programme has been established, and a proportion of costs have been recognised by Ofwat at Draft Determination. However, Ofwat's cost assessment modelling approach does not adequately account for the increased treatment complexity and, as a result, underestimates the totex allowance in the water networks plus price control.

The two variables included in the models for treatment complexity fail to capture the change in complexity between Bands W3 and W5 (see Table 9), which require higher costs. We consider an adjustment is required to our botex costs to ensure an efficient allowance is appropriately identified to deliver the statutory programme.

Additionally, as Ofwat do not use the actual weighted average treatment complexity forecasts from companies, instead assuming the complexity remains constant throughout the period, the efficient allowance is further underestimated. Regardless of the cost drivers included in the model, Ofwat's models cannot capture the costs associated with increased treatment complexity in AMP7 if Ofwat does not forecast an increase in treatment complexity drivers. Updating the models to reflect the actual treatment complexity levels over the period will improve the accuracy of the assessment.

We also highlight some concerns with the approach for calculation implicit Opex enhancement allowances.

Base expenditure modelling (Treatment Complexity)

Following the initial assessment of business plans, we identified an issue with Ofwat's cost assessment relating to our drinking water quality programme.

The totex models do not recognise where investments are required to increase treatment processes within complexity level bands 3-6. As we are required to deliver a large drinking water quality programme, which increases the treatment complexity within these bands, the totex models are currently significantly underestimating the efficient expenditure allowance we will have to make to implement that programme.

We provided clear evidence outlining the issue in our IAP response in April 2019:

- YKY.CE.A1: Securing cost efficiency Section 2.2.

- Appendix YKY.CE.A1-4: Ofwat’s enhancement modelling approaches at the IAP: a review, Oxera, March 2019, Section 3.

There is no indication in the draft determinations that Ofwat has reviewed or addressed the issue. The evidence we presented in the April business plan resubmission therefore still stands, and we have supplemented it with further supporting analysis as part of our representation.

The change in our works complexity is summarised in the table below and can be seen to be significantly different to the rest of the industry, with only one other small company experiencing a similar movement within complexity bands.

Table 8 – proposed relative treatment works complexity changes in AMP7

Company	Simple works	Band 1	Band 2	Band 3	Band 4	Band 5	Band 6
ANH	-1%	0%	1%	0%	0%	-1%	1%
NES	0%	0%	0%	0%	0%	0%	0%
NWT	0%	0%	-1%	7%	-3%	-3%	0%
SRN	0%	0%	-3%	0%	1%	3%	0%
SVH	-2%	0%	0%	0%	0%	2%	0%
SWB	0%	0%	0%	-22%	0%	22%	0%
TMS	0%	0%	0%	0%	0%	0%	0%
WSH	0%	0%	0%	0%	0%	0%	0%
WSX	0%	0%	0%	0%	0%	0%	0%
YKY	0%	0%	0%	-18%	4%	15%	0%
AFW	-2%	0%	0%	-3%	-1%	7%	0%
BRL	0%	0%	0%	0%	0%	0%	0%
PRT	-3%	0%	0%	0%	3%	0%	0%
SES	0%	0%	0%	0%	0%	0%	0%
SEW	-1%	0%	0%	3%	0%	-1%	0%
SSC	0%	0%	-12%	0%	23%	-10%	0%

The solutions to address our DWQ risks are agreed with the Drinking Water Inspectorate through the process of Regulation 28 Notice so the confidence in the change in complexity is high and different solutions have been rejected on cost or effectiveness grounds.

Whilst we recognise that Ofwat’s botex plus models include two variables for treatment complexity, neither of these adequately reflect the impact of our programme moving between complexity bands. We set out in the sections below why neither of these variables accurately captures the expenditure requirement.

Variable - % of water treated at complexity level bands 3-6

At draft determination, Ofwat has used a variable ‘% of water treated at complexity level bands 3-6’ in the water botex modelling. The below table shows the definitions of the treatment complexity types.

Table 9 – Definitions of treatment works complexity

The categories of treatment types are:	Examples
SD: Works providing simple disinfection only;	<input type="checkbox"/> Marginal chlorination <input type="checkbox"/> Pre-aeration
W1: Simple disinfection plus simple physical treatment only;	<input type="checkbox"/> Rapid gravity filtration <input type="checkbox"/> Slow sand filtration <input type="checkbox"/> Pressure filtration
W2: Single stage complex physical or chemical treatment;	<input type="checkbox"/> Super chlorination <input type="checkbox"/> Coagulation
W3: More than one stage of complex treatment; but excluding processes in W4, W5 or W6.	<input type="checkbox"/> Flocculation <input type="checkbox"/> Biofiltration <input type="checkbox"/> pH correction <input type="checkbox"/> Softening
W4: Single stage complex physical or chemical treatment with significantly higher operating costs than in W2/W3;	<input type="checkbox"/> Membrane filtration (excluding desalination) <input type="checkbox"/> Ozone addition <input type="checkbox"/> Activated carbon / pesticide removal
W5: More than one stage of complex, high cost treatment ;	<input type="checkbox"/> UV treatment <input type="checkbox"/> Arsenic removal <input type="checkbox"/> Nitrate removal
W6: Works with one or more very high cost processes;	<input type="checkbox"/> Desalination <input type="checkbox"/> Re-use

By definition, bands W4 and W5 require higher cost treatment processes (in bold).

For our drinking water quality programme, we are required to include a new stage of treatment, which moves our treatment complexity classification from W3 to W5. As a result, we will incur ongoing operating and maintenance costs for the additional treatment stage which is by definition, ‘high cost’.

However, as the change in complexity happens between bands W3 and W6, it is not accounted for by Ofwat variable. Therefore, neither additional operating or maintenance costs are recognised in the modelled allowance for 2020-25. Additionally, as the higher ongoing maintenance costs are not accounted for, it also distorts future cost assessments, resulting in under allowances in perpetuity.

As previously outlined in our April resubmission (YKY.CE.A1: Securing cost efficiency Section 2, page 52), the additional base maintenance requirements specifically associated with the drinking water quality programme are £32.3 million.

Although Ofwat’s draft determination models do provide an implicit allowance of £5.4m for the added treatment complexity, the implicit allowance is materially underestimating the appropriate efficient expenditure (see below).

Reviews of the alternative models (and combinations of relevant variables) which do account for treatment complexity indicate that the implicit allowance for drinking water quality complexity could increase up to £70 million. Details of these models are provided in the supporting Oxera Report 69 in Appendix CE3 Section 2.3.

Despite evidence presented at in our April business plan resubmission, there is no indication in the draft determinations that Ofwat has reviewed or addressed the issue we consider a deep dive assessment of the base elements of the drinking water quality programme would be the most appropriate solution.

Variable - weighted average treatment complexity

Ofwat uses its own forecast of weighted average treatment complexity which assumes this variable remains constant throughout the 2020-25 period. Ofwat forecasts do not match the actual treatment complexity requirements stipulated by the Drinking Water Quality Inspectorate.

In the enhancement deep dives on raw water deterioration and taste & odour, Ofwat recognises the need and the majority of the costs to address our 2020-25 water quality risks.

Specifically, we are required to install additional treatment processes on six large water treatment works and following the definitions in Table 9, increase the complexity of these works from W3 to W4 and W5 (see Table 8). These sites consist of circa 18% of our total water production.

The assumption that the 'weighted average treatment complexity' variable remains constant is categorically incorrect. By definition, increasing the volumes in W4 and W5 have a corresponding impact on the average treatment complexity.

Using the actual changes in Weighted Average Treatment Complexity that will occur as a cost driver would allow for a more accurate and realistic estimation of the efficient cost allowance for Yorkshire Water in the botex models.

Oxera's report (Appendix CE3 - section 2.2) estimates that use of the actual change in this variable would increase our allowance in Water by 20.8m.

Calculation of implicit Opex allowance

We commissioned Oxera to review the approach to calculating implicit Opex allowance (Appendix CE3 - Section 3).

There are several concerns with the way in which the implicit allowance is calculated that we highlight as follows:

- The significant variation across companies leads to a highly sensitive model.

⁶⁹ Appendix CE3 - Oxera Report: Responding to Ofwat's draft determination of Yorkshire Water's wholesale water cost allowance

-
- Historic enhancement expenditure is not necessarily predictive of future enhancement expenditure (lumpy).
 - Exclusion of companies who had no opex in the chosen year may have biased the implicit allowance.
 - Derivation approach assumes consistent enhancement capex/opex ratios which is not true of all companies.

We propose that Ofwat carefully reviews this approach ahead of Final Determination so that a more robust assessment of Implicit Opex Allowance is made.

Traffic management act costs

The path to the draft determination

Within the results of the IAP, Ofwat signalled that Traffic Management Act (TMA) costs had not been included within the econometric models since they were not well correlated with the cost drivers used in the simplified econometric models for PR19. TMA costs were viewed instead as an unmodelled cost with an efficiency challenge applied derived from Ofwat's modelled challenge on base costs. In our IAP resubmission, we chose not to focus on the efficiency challenge on TMA, focusing instead on other areas of the cost challenges made.

On 7 May, Ofwat sent Yorkshire Water a query on TMA costs (YKY-DD-CE-009). We responded to this on 9 May, providing some three pages of additional detail on the specific areas requested in the query.

Within the draft determination, Ofwat stated:

In its business plan Yorkshire Water forecasts a significant increase in its Traffic Management Act costs. We note that permit costs are high compared to other companies and the company does not forecast any efficiencies in its additional cost per permit despite the significant increase in permits it is forecasting. We apply a 50% reduction to Yorkshire Water's costs as we consider its permit costs and additional associated costs are high and do not factor in any efficiencies.

We were very disappointed in this intervention. In other areas where cost challenges have been applied, Ofwat used a default mode of a 20% cost challenge where it considered there was insufficient evidence. So, it is wholly disproportionate to apply a 50% reduction without any depth of explanation here. Moreover, as we evidence below, the majority of the drivers of the costs are outside of company control. As a result, we have prepared this additional representation to demonstrate the manifest flaws in Ofwat's approach.

The drivers of TMA costs

There are five specific drivers of TMA costs as summarised in the table below.

Table 10 – Drivers of TMA costs

TMA cost driver	Influencing entity
Use of permits or notices	Highway Authority preference influenced by pressure from Department of Transport
Highway Authority speed of adoption	Highway Authority preference influenced by pressure from Department of Transport
Volumes of work	Company driven, although important influences from regulatory performance targets and weather events
Costs per permit	Set by Highway Authority
Permit related impact on job costs	Strongly influenced by Highway Authority requirements stipulated in permits, some company influence on unit costs

When water companies carry out street works, they must either issue a notice to the Highway Authority or obtain a permit from the Highway Authority. Unlike notices, permits for street works involve significant costs to water companies. It is in the hands of Highway Authority to decide whether to accept notices or require permits and, the Highway Authority also determine the cost of the permits. As we explain below, the drivers of TMA costs lie mostly outside the influence of the company. The following sub-sections consider each of the five cost drivers in turn.

1. Use of permits or notices

The overarching background to this is the underlying Street Works legislation (NR&SWA/TMA). Under this new legislation, Yorkshire Water has a statutory obligation to inform Highway Authorities when working in the public highway via notices or permits. A key difference between a notice or a permit is that for a street works notice, the company informs the Highway Authority of their intention to work. For a street works permit, the company must actively seek permission to work. Permits carry a charge to the Utility, notices do not.

Highways Authority can challenge either type, particularly on grounds of potential traffic disruption, and refuse a permit or instruct a utility to leave site. Permits allow the Highway Authority more control over utility activities and are designed to improve planning, co-ordination & safety and reduce traffic disruption.

Due to pressure from the Department for Transport (DfT) Highway Authority are visibly increasing the focus on the legislation and are introducing more permit schemes and moving away from notice schemes. This is, in part, due to the new IT ‘Street Manager’ system that the DfT are introducing nationally to replace the existing ‘ETON’ notification system.

The decision on whether to use notices or permits lies in the gift of the HA, not the company.

2. Highway Authority speed of adoption

During the first years of the current price control period, all key Highway Authority (except North Yorkshire County Council (NYCC)) in our region followed the 'Yorkshire Permit Scheme' which was seen by all parties as a balanced approach with a mixture of notices and permits that concentrated on key routes and traffic sensitive roads (circa 10-15% of the road network).

The DfT wrote to all Highways Authority in August 2018 asking them to justify not using a permit scheme. By April 2020 (largely due to DfT requirements around the introduction of the new StreetManager IT system) we expect all Highways Authority in our region to have moved to 'all streets' permit schemes.

Across the Yorkshire Water region, the current position (July 2019) is a faster take-up of permitting than envisaged in the price review, with the following adoption timescales currently experienced or forecast below:

- North Yorkshire, Doncaster, Bradford, North Lincs, Lancashire, Derbyshire are running 'all Streets' permit now i.e. all our highway activities in their area via permits, so no notices. NYCC were the first 'all streets' permit scheme; the others above all went live in 2019.
- Rotherham and Barnsley will probably be introducing their 'all streets' permit schemes in September/October 2019. They currently run a mixture of permits and notices (see para below).
- All others – notably Leeds, Sheffield, Kirklees, Calderdale, Wakefield, Hull, York, East Riding of Yorkshire will probably implement early 2020 and we expect all our Highways Authority to be running all streets permit schemes by April 2020. These Highways Authority also currently run a mixture of permits and notices (*see para below*)

Again, the decisions on this cost driver lie firmly in the gift of the Highways Authority, not the company.

3. Volumes of work

The volume of work is the only TMA cost driver that is substantively influenced by the company, but external factors are also important here also. The volume of our activities on the Water Distribution network has increased significantly since late 2017. Along with the increase in permits/notices the proportion of 'urgent/immediate works' categories have increased significantly (circa 60%) and the level of Temporary Traffic Regulation Orders (temporary traffic regulation orders – effectively road closures) has also increased significantly (in 2016/17 road closures per month were circa 100; in 2018/19 circa 300 per month).

There have been two key factors behind this increase in activity. Firstly, the atypical weather patterns during February 2018 (the Beast from the East) resulted in a substantial increase in the volume of work to fix leaks. Secondly, the levels of activity have been influenced by our response to

the challenges in the Ofwat PR19 methodology to deliver ambitious improvements in service delivery. This factor will also be important post 2020 given the DD interventions by Ofwat on PC targets and ODIs.

4. Costs per permit

Since the submission of our query response in May, we have been able to obtain a more detailed breakdown of permit costs. There are very significant variations between the Highway Authority. For example, the average permit paid to Leeds Council in May 2019 was £86.68, and Sheffield council £70.25. In contrast, the average paid to North Yorkshire is the lowest of all Highway Authority in our region at £49.39. Based on an analysis of all permit costs across the Highway Authority in our region, we believe that the updated information supports a weighted average cost per permit of £59.77. This represents a reduction of just over 25% in the permit costs compared to the level indicated by the evidence available at the time of the Ofwat query.

In summary, permit costs are determined by the individual Highway Authority, so the decisions on this cost driver lie in the gift of the Highways Authority, not the company. Setting any efficiency challenge on permit costs is therefore not appropriate. While the new information allows us to project a lower average cost per permit, this does not compensate for the other factors outside of company control that are driving costs up.

5. Permit related impact on job costs

As outlined in our response to the Ofwat query, 65% of the costs forecast relate to the consequential impact of the use of permits on our operating approach and hence average repair costs. We believe that our approach on this specific point is consistent with the definitional guidance for the Annual Performance Report in 2018-19.

In its consultation 'APR Consultation 2018-19', Ofwat recognised that it was 'asked to provide further guidance on what costs companies should include in this line. For example, should only the direct costs of the permits be included? Should the administration or implementation costs (such as the additional costs arising from working under the legislation) be included as well? Or should all the costs associated with the permit as well as the permit itself be included? We are minded requiring that all costs that arise as a result of complying with the legislation should be recorded'.

We note that if other companies have not followed this approach, this could seriously distort the comparison of estimated TMA costs.

The impact of permits on jobs costs is driven from a number of factors. The very nature of applying for a Permit gives the Highway Authority the chance to insist on the way the work is carried out to cause the least disruption to traffic users. Consequently, many jobs must be done out of hours, completed and site cleared within one working day, and additional requests for work must be completed on a weekend.

One stipulation of many permit conditions is that the traffic management on site includes ‘manned’ lights, where a man stands on site with the lights to change the phasing on them if traffic builds. Another example is that a Highway Authority may say that we must carry out a repair on a weekday night and we must be off the highway by the next working day. We would then have to have task, backfill undertake reinstatement and possible traffic management resource all working out of hours at considerable cost. If the job changes on site due to operational reasons such as a larger excavation, this can result in the requirement to alter the permit conditions. This would again involve an additional charge payable by a further variation.

Another cost impact of the Permit scheme is the turnaround of jobs on Permit schemes. The Highway Authority, as part of the Permit conditions, expect Yorkshire Water to continually work on Permit roads and streets and to be offsite as soon as possible. This again drives additional costs and inefficiency of resource to prioritise these jobs and clear the site quicker than would be expected on standard roads.

Unit costs within any degree of company influence

Our current average cost of a mains repair is £1,058 (2018/19). This is the average charge from Morrisons Utility Services (Yorkshire Water’s Repair and Maintenance Partner) for all mains repairs for the 12 months to the 31 March 2019. The calculated permit related impact on job costs is £146 per job which represents an uplift of 13.8%. There are three components in this £146 uplift.

Firstly, the labour component is a large element of the repair bill for the network – circa 60% of each job. As can be seen in the table below there has been a cumulative increase in out of hours (OOH) working of 52.1% since 2015-16. This table has come from the Morrisons Utility Services contract management team. Each OOH job attracts an increase of 30% in the base wage bill from Repairs and Maintenance contracted operatives. This coupled with reduced efficiency from planning and scheduling of work has added **£42.54** per permitted job.

Table 11 – Cumulative increase in out of hours

Financial Year	OOHs
2015-16	9.6%
2016-17	10.0%
2017-18	11.8%
2018-19	14.6%

Secondly, Highway Authority charges (e.g. payment for road closures under temporary traffic regulation orders) have also increased as a result of Permit schemes along with additional Traffic Management charges (e.g. permanently manned lights, three- or four-way lights for complex

junctions, extended scope and coverage). These elements add some £98.66 per permitted job of the £146 uplift.

Finally, there is a small increase in other costs associated with Permits. This reflects additional administrative resources to manage the application process to the Highways Authority and payment of the subsequent invoices etc. and has been calculated at approx. **£4.80** per permitted job.

Manifest flaws in the approach that Ofwat has used at draft determination

Ofwat's justification for the imposition of a 50% reduction in our forecast TMA costs was that our costs are higher than for other companies and that we had not included any efficiencies in the cost per permit despite the increase in the number of permits. We have interpreted this as a belief that there should be economies of scale driven the number of permits. However, given the high proportion of cost drivers that lie outside the influence of the company and are set by Highway Authority, it is far from clear what the potential scale economies would be. The costs comprise a relatively small uplift on each job, with the specific working requirements stipulated by the Highway Authority creating the additional costs. So, the presumption that there are potential scale efficiencies appears contrary to the true picture on cost drivers.

As explained above, there are five drivers of TMA costs. Of these, the volume of work can reasonably be viewed as being under company influence, although as noted, weather events and the nature of regulatory targets also play an important role. The other drivers of the numbers of permits all lie in the gift of the Highways Authority and the influence exerted by the DfT.

Turning to the cost drivers, the cost per permit is determined by Highway Authority not by the company. Our updated information supports a forecast reduction to £60 for the cost per permit (compared to £80 previously). However, even this lower figure means that some 29% of the estimated costs (£60 of the total of £206) cannot be influenced by the company. So Ofwat's imposition of a 50% reduction in the allowed TMA costs equates to a reduction of 70% in the cost elements over which the company has any degree of influence⁷⁰.

As evidenced in section 2.5, the nature of the additional costs is strongly influenced by the working requirements stipulated by the Highway Authority. The related Highway Authority charges and additional traffic management charges cover some 68% of the calculated permit related costs of £146. The company has only very limited or no influence on these. Ofwat's unjustified imposition of a 50% cut therefore reduces costs under the direct influence of the company to less than zero. This cannot be a proportionate response to the uncertainties around TMA or any perceived weaknesses of evidence.

⁷⁰ A 50% reduction in the lower cost of £206 equates to a cut of £103 per job. But since the permit cost is determined by the HA, this equates to a 70% reduction in the uplift cost of £146 explained in section 2.

We believe that given the compelling evidence set out in this note and the lower permit cost incorporated, Ofwat should remove this reduction in the forecast TMA costs.

Evidence to support an alteration to the PAYG rate.

The plan that we submitted in September 2018 was ambitious; it included an upfront cost efficiency of 16% and industry leading levels of stretch in key service areas. We were surprised and disappointed at the difference between our own and Ofwat's view of efficient costs, especially considering that Ofwat's own models found us once again to be broadly efficient in our current and historical costs.

The plan contained, in our view, the efficient costs to achieve service levels required by our customers and the optimal mix of efficient operating (opex) and capital (capex) costs to deliver these. We assessed the full benefits of the specific solutions optioneered in our plan, using our six capitals approach and our industry leading Decision-Making Framework to optimise the overall AMP7 investment programme.

As we have stated in our executive summary, following receipt of Ofwat's Draft Determinations (DD), our approach is to focus on delivering our plan for our customers by offering a resolution to the impasses on views of efficient costs. To do this we have worked to understand how we can accommodate the industry wide policy challenges regarding service improvements imposed by Ofwat and reduce the size of the gap between the two views of efficient costs.

We will reflect Ofwat's new policy position that performance for the four upper quartile performance commitments (PCs) in the methodology should not require additional funding from customers. We will also include external sewer flooding in this grouping. In the spirit of compromise, 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 (£133m Opex and £167m Capex) for upper quartile service from our tables.

To achieve this, we have moved away from our ambitious central case plan to a variant that adds significant further stretch, and therefore increased risk to cost and outcomes, across a wide number of elements of our plan. In order to balance this risk, and maximise our ability to deliver service to customers, an adjustment to the opex/capex mix of our Botex plan is necessary. We have worked hard to establish mitigations against the increased risk position and in all our revisions have put service and long-term resilience and reliability as the first consideration.

After detailed review of the delivery approaches and options to allow us to move away from our central case (our original plan) we propose to reduce capital base maintenance by £180m with a corresponding increase in operating costs as a result of the adoption of more opex led solutions. The adjustment reflects the revision of our plan to allow us to meet the challenging targets with reduced totex overall and therefore becomes our new natural rate. The change reflects a revised approach to delivering outcomes, further efficiency challenges and, in our view, the best approach

to continue our drive to minimise any negative impact on our customers through our activities to maintain our assets and improve our service levels.

Table 12 explains the detailed package of changes that we propose to implement and how they impact on our opex and capex position.

Table 12 – Proposed adjustments to Opex/Capex mix within our Botex costs

	Removed from the Plan		Reallocated	
	Enhancement Capex £m	Enhancement Opex £m	Base Capex £m	Base Opex £m
Water Resources	-	-	(9.35)	-
Water Network Plus	(71.9) Leakage (15.1) ItS	(64.7) Leakage (28.6) ItS	(93.6)	+103
Wastewater Network Plus	(24.0) Pollution (56.0) ISF	(18.2) Pollution (22.1) ISF	(77.5)	+77.5
Bioresources	-	-	-	-
Total	(166.1)	(133.6)	(180.4)	+180.4

Note: ItS = Interruptions to Supply; ISF = Internal sewer Flooding.

We discuss below two related areas that explain why we believe these changes are necessary.

Achieving UQ service targets and achieving further service improvements

In our DD representation we provide additional evidence to support our belief that the approach Ofwat has taken has created a disconnect between costs and outcomes. Ofwat's asserts that more stretching performance commitments should not cost customers more money. Even if this could be proved for minor, incremental improvements, it is not true for the major changes in performance being sought in the targets imposed by the DD interventions. Such a belief could only possibly be justified if the cost modelling approach fully considered the alignment of costs and service delivery. In other words, like in other industries, an efficient company can only achieve higher service levels by incurring additional costs. As evidenced in the Economic Insight report we submitted with our IAP resubmission, Ofwat's approach does not properly consider this⁷¹.

Ofwat's approach is based on a policy position which is not supported by evidence. With the increased emphasis on comparative PCs and outcome delivery incentives (ODIs) compared to PR14, this has greatly magnified a flaw in the price review approach that was previously identified by the CMA in its PR14 determination for Bristol Water⁷²

⁷¹ 'Maximising customer benefits from the outcomes framework' Economic insight (2018)

⁷² 'A reference under section 12(3)(a) of the Water Industry Act 1991.' CMA (2016) page 284.

Our movement to comply with Ofwat's policy position does not change the fact that we will need to invest to achieve upper quartile service performance. To do this within our existing totex allowance we need to reduce costs elsewhere, namely in our capital programme.

The immediate nature of the upper quartile service challenges means that more operational interventions are needed, rather than waiting for the delayed benefit typically delivered on completion of long duration capital schemes. For example, a major cause of internal and external sewer flooding is blockages in the sewer network caused by the introduction of items such as wet wipes and fats into the pipes (sometimes referred to as 'fatbergs' in the media). These build up over time and cause blockages. To provide longer term improvement we already investing to significantly increase our ability to remotely monitor sewers through telemetry. This allows us to proactively identify increasing sewage levels in the pipes before it impacts in customers. The most effective method of clearing these blockages is to jet the sewers that are blocked to break down and remove the safely remove the materials causing the blockage. This is an opex activity and will be required to allow us to meet our targets. Another key activity is to use targeted campaigns of advertising and social media to inform people of the impact of putting unsuitable material into the sewer pipes. In our PR19 plan we present the work underway and planned continue to really understand our customers and the best form of communication and co-creation of solutions to help resolve these types of issues.

Meeting more challenging PCs than those proposed in our IAP plan means that we have looked at our plan again and need to prioritise expenditure in different ways. We must ensure that we are maximising a totex approach, looking for all opportunities to optimise our costs with the right balance of long duration capital construction solutions and other innovative opex based (often co-created) solutions. Our initial view to address the enhanced targets proposed at DD is through increasing our operating capabilities and engagement with communities about the challenges faced. For example:

- the target to halve asset outage on water treatment works should be partially addressed through advances in data that allow enhanced maintenance.
- Our highly ambitious per capita consumption (PCC) target will be delivered through reuse of effluent in industry and collaboration with our customers regarding use of water.
- An efficient option to improve supply interruption is using flexible piping that can maintain continuous supplies during a repair.

These are all effective solutions that use innovation and data improvement to target the right solutions – solutions which are often classified as opex as opposed to capital expenditure. It is our belief that opex solutions can be misinterpreted as "short-term" because of the nature of the

expenditure. These are cost effective totex solutions that reflect the nature of our ongoing conversations with our customers and innovative use of data (such as our open data initiative).

We will make these changes whilst maintaining a focus on asset health. Whilst this reallocation will inevitably mean a short-term reduction in asset replacement (the movement of £180m from capex to opex), we estimate that targeting operational maintenance activity will help us achieve our asset health performance commitments by improving asset performance and reducing failures. For example, more internal and external sewer flooding is caused by sewer blockages (where customer engagement and jetting are the right solutions) that sewer collapses (where targeted sewer section replacement may be the best solution.)

Ensuring efficient management of resources

Our costs submitted in our original plan, and the revised costs submitted at IAP contained an operating cost efficiency challenge of over £150m compared to our outturn AMP6 position over AMP7. By removing the UQ expenditure without reallocation from capex to opex, this efficiency requirement would have increased by a further £133m.

As the remaining opex before reallocation contains a significant proportion of fixed costs relating to rates, contracts, salaries, power and chemicals, and whilst we will always work hard to ensure that these costs are kept as low as possible, there is a natural limit to what can be achieved. For example, we have invested in the current AMP period to enhance how much energy we can make for ourselves from reusing the by-products of our treatment process to create electricity that in turn is used to power a number of our operational sites.

Further efficiency in this area requires significant changes to our operating model and asset base. For this to be implemented sustainably, changes will need to be deployed over time. For example, as part of our net zero carbon commitment, we are moving towards all our vehicles being powered by electricity or other low carbon options instead of petrol or diesel; this will save money over time as well as improve our environment. This change must be done in a way that ensures the right balance between the age and costs of the existing fleet, for example lease vehicles such as cars and vans generally have a seven-year lease time, as these leases expire, we would replace them with electric vehicles

Also, as we continue to improve our data analysis the approaches we take to deliver our services will continue to evolve and may result in changes in the types of assets used. Again, the cost and service benefits to changes to processes must be balanced against the asset life of existing assets.

A strategic move to totex solutions has already been made within the company and we have recruited additional maintenance, leakage and sewerage network staff to deliver our service improvements as this is the most cost-effective ways of improving some service levels. It would not be economic to change strategy or resourcing model in Year 1 of AMP7 and service would suffer as

a consequence. Our capex to opex reallocation allows for this service improvement strategy to continue as we develop our longer-term operating model.

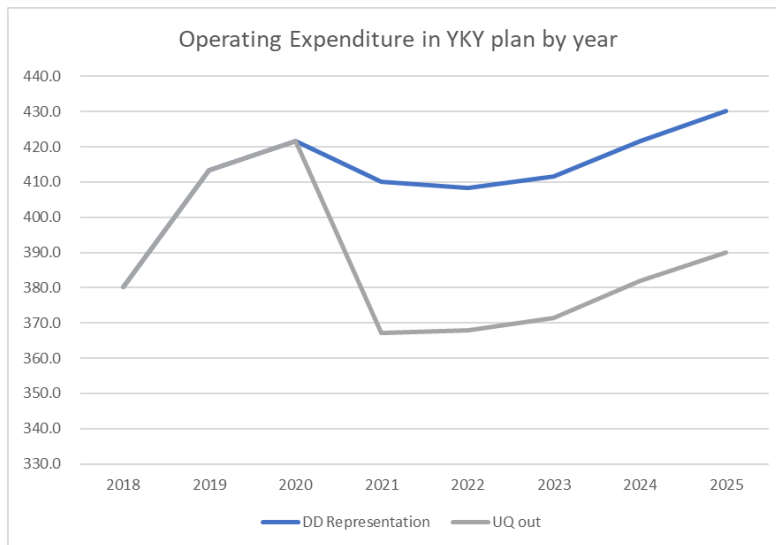


Figure 9 – New operating cost profile following reallocation (blue)

The operating cost impact of reallocation of the capex cost to opex is shown in Figure 9 above.

Impact on speed of money and customer bills

The rebalancing from capex to opex does create a new natural rate (i.e. the actual mix of opex and capex required to deliver the revised plan) and hence the appropriate PAYG ratio. Our plan, in line with the expectations of our customers has always been based on the adoption of our natural rate and we have continued to adhere to this principle to prevent any intergenerational bill impacts.⁷³ Ofwat accepted this principle at IAP and draft determination. Ofwat made technical adjustments at the draft determination stage to reflect the evolution in the capex/opex balance as a result of DD totex interventions. We have made similar technical adjustments as a result of this additional rebalancing.

We discussed our approach in this area with the Yorkshire Forum for Water Customers (the Forum) during our meeting on 22 August 2019, confirming that we were maintaining the principle of using the true natural rate which the Forum accepted as reflective of what our research has told us our customers want (stable bills and a natural rate). The impact of this rebalancing is to increase our natural rate from 52% as submitted in our IAP to 55.7% with this submission.

We have reviewed this position against the information provided by Ofwat in Figure 5.2 of the technical appendix on aligning risk and returned published with the draft determinations. Although our PAYG will increase slightly, our position relative to water and sewerage peers will be little changed. Three companies already have PAYG percentage ratios in the high 50s or low 60s

⁷³ Yorkshire Water “Our PR19 plan” September 2018 Ch8

(Severn Trent, South West and United Utilities) and our PAYG will remain comfortably below those levels.

The mechanistic impact of the change in PAYG ratio on customer bills is to increase average bills by some £7 per annum. However, unlike the position at IAP resubmission, the absorption of the UQ costs means that the package in our representations still delivers a bill reduction of just under 2%.

Metaldehyde costs

Ofwat feedback

Company to provide evidence to confirm DWI agreement with its submitted plans/revised undertakings and that no Metaldehyde specific treatment or product substitution costs are included in the requested allowance.

Our response

Our plans set out in our PR19 Submission to the Drinking Water Inspectorate (DWI) in December 2017 included the use of product substitution in managing the risk of Metaldehyde and other pesticides. Given this approach, in this same submission we also confirmed that we would not be managing the risk of Metaldehyde through treatment solutions.

Following our business plan submission in September 2018 to Ofwat, the use of Metaldehyde was banned by Defra, the ban prohibited the use of these slug pellets from the spring of 2020 with sales being banned from summer 2019. As a result of this change, we updated our Metaldehyde undertaking and removed product substitution costs from our PR 19 Business Plan.

In July 2019 the ban on Metaldehyde products was overturned by the high court, we are now therefore proposing that the costs associated with Metaldehyde product substitution are re-instated in our plan, in order to manage the risks associated with the continued use of this pesticide.

Reinstatement of Metaldehyde costs

In December 2017 our PR19 Water Quality Submission to the DWI listed the following activities to address risks arising from Metaldehyde and other key pesticides:

- The continued employment of Catchment Sensitive Farming Officers through Natural England.
- The deployment of additional Catchment Sensitive Farming Officers by Yorkshire Water.
- Development of more granular risk mapping and GIS tools to maximise the impact of Catchment Sensitive Farming Officers.
- The development of predictive techniques for our Service Delivery Centre to allow improved decision making relating to abstractions.
- Consideration of targeted PES (Payment for Ecosystems services) including product substitution to reduce Metaldehyde inputs into high risk catchments.
- Consideration of soil health advice to minimise the use of chemical control products in general and more specifically Metaldehyde.
- Ways of driving best practice farming activities from the early adopters into the catchments.
- Working with the supply chain for arable products to promote Metaldehyde free approaches.

- Developing an innovative system for the ‘loan’ of equipment, which brings significant risk reduction into catchments as a means of driving new slug control techniques into farming.
- More sustainable links with our catchment stakeholders such as the Rivers Trust and Yorkshire Wildlife Trust.

This confirms that PES (Payment for ecosystems services) schemes, including product substitution to reduce Metaldehyde inputs into high risk catchments, formed part of our proposal and conversely that treatment solutions were not included in our plans.

To support this catchment activity the following line was included in WINEP3

Table 12 -Additional line in WINEP3

WINEP ID	Regulatory Date	WINEP Obligation Title
7YW200142	22/12/2024	Roll out of targeted product substitution trial (Irtton Metaldehyde) into new targeted hot spot areas in SUNO, Esk and Hull catchments.

Following our business plan submission in September 2018 the use of Metaldehyde was banned by Defra, the ban prohibited the use of the slug pellets from the spring of 2020 with sales being banned from summer 2019. £1.46m of costs associated with Metaldehyde product substitution were therefore removed following Ofwat’s Initial Assessment of Plans, as a result of the ban.

Accordingly, as part of the DWI regulatory process a revised undertaking for Metaldehyde was submitted in July 2019; this did not reference PES or product substitution as steps to be delivered by the Company. The relevant extract is copied below.

Table 13 -Schedule to YKS-2019-0002 DWI undertaking for Metaldehyde

4	Steps to be taken	Delivery Date
(a)	Ensure that Metaldehyde has been assessed as a hazard as part of the regulation 28/29 Risk Assessment for the supply systems supplied by all Water Treatment Works (WTWs) listed in the Annex to this Schedule of Works, according to a Drinking Water Safety Plan approach.	Ongoing
(b)	<ul style="list-style-type: none"> i) Companies shall implement all actions as defined in their actions plans submitted to the Inspectorate on 31 December 2014. ii) Companies shall implement additional transitional arrangements during the period of stock use, ensuring the maintenance of supportive relationships with farming community. 	Ongoing as necessary until Metaldehyde is not used in the open environment
(c)	<p>Medium term measures</p> <ul style="list-style-type: none"> i) Continue with enhanced raw water monitoring programme to inform risk. ii) Where ongoing significant risks are identified the company shall continue the DWSP approach and appropriate measures to mitigate the risk shall continue to be implemented. iii) Liaise with the Environment Agency where there are continued detections in raw water. 	Ongoing until the revocation of this undertaking.
(d)	<p>Long term measures:</p> <p>Continually appraise the risk of Metaldehyde and the total pesticides parameters as hazards in raw waters as part of the regulation 27/28/29 Risk Assessment for the supply system(s) associated with each relevant treatment works according to a Drinking Water Safety Plan approach, and ensure that Regulation 28/29 documents are regularly reviewed, and updates provided as appropriate.</p>	Ongoing

Following the amendments made to this Undertaking on Metaldehyde on 30 July 2019 the High Court ruled against the Secretary of State for Environment overturning the ban on Metaldehyde products. If this High Court ruling is accepted by Defra Ministers, and the ban is lifted, we will have to review its Undertaking with the DWI and reinstate the line within WINEP.

As a result of these potential changes to the legal status of Metaldehyde we are now anticipating similar usage levels of the pesticide to remain. Therefore, to manage the risks arising from Metaldehyde usage we will have to deliver the same initiatives as those set out in September 2018 in our business plan submission. Therefore, the original cost of £1.46m which was previously removed from our plan (Table WS2-Wholesale capital and operating expenditure by purpose: line 17–WINEP/NEP ~ Drinking Water Protected Areas (Schemes)) associated with the WINEP obligation 7YW200142 for product substitution should be re-instated.

Summary

In summary we have demonstrated that the impact of the ban of Metaldehyde had been reflected in our plans, and that until the recent overturning of the ban, it had been supported through amendment to the Metaldehyde undertaking.

However, following the recent High Court decision on the use of Metaldehyde products, we are now anticipating an increased risk from this pesticide and therefore request the re-instatement of the costs associated with product substitution.

Strategic regional water resource development

Ofwat feedback

'Yorkshire Water did not request any funding related to strategic regional water resource development as part of its April 2019 Business Plan. Ofwat provided additional guidance to companies with the draft determination (draft determinations Strategic regional water resource solutions appendix) and wrote to Yorkshire Water in August 2019 highlighting it would be willing to consider requests in this area at final determination.'

Our response

Yorkshire Water, as a leading member Water Resources North (WRN), will be contributing to strategic studies in AMP7 to investigate options to share resources with neighbouring water companies and understand the potential to facilitate the displacement of water further south, in order to support national water resources resilience.

No costs were previously included in the business plans of WRN members as the options are not as mature as those of other regional groups and a justification of need has not been identified for developing through the gated process described in Ofwat's Draft Determinations 'Strategic regional water resource solutions appendix'. Our focus in the near term will also be on the promotion of water trading within the WRN region as we believe that this could be an important adjunct to the desire for enhanced inter-regional trading.

Since the PR19 Business Plan submissions, the Environment Agency's work on the National Framework has developed, and expectations are emerging for regional water resource plans to be produced for consideration in WRMP24.

WRN has identified five schemes that may have potential to be developed into transfer options for regional water resource planning. These options are not yet at a level of maturity where it would be appropriate for them to be included in the gated process that Ofwat has defined for schemes being promoted in other regions. Completion of the strategic studies within the first two years of AMP7 will allow us to understand the potential for the schemes to be progressed, should a justification of need be identified in the future.

Given this greater clarity and Ofwat's letter, we are now requesting funding in the PR19 Final Determination to carry out strategic studies to develop the WRN options outside of the gated process.

Yorkshire Water is a partner company in all of the schemes referenced above and therefore is the largest contributor to the strategic studies, with a total funding requirement of £0.408m to deliver the studies over years 1 and 2 of AMP7. This has been included as a freeform enhancement cost line

named ‘Strategic regional water resource solutions’ in table WS2. This funding will help WRN identify feasible schemes that will enable the transfer of water from the North (Northumbrian Water and Yorkshire Water) to the east, west and midlands (Anglian Water, United Utilities and Severn Trent Water), which could potentially unlock the opportunity for transfers further south.

About Water Resources North

Yorkshire Water is a member of WRN. WRN’s core membership comprises three water companies – Yorkshire Water (YW), Northumbrian Water (NWL) and Hartlepool Water (HW) – and the Environment Agency. Recognising the need to ensure that our activity is joined up with our neighbours, three more water companies – Anglian Water, Severn Trent Water and United Utilities – are affiliated to WRN as associate members. Initial discussions have been held with other stakeholders in our region including Natural England, the National Farmers’ Union and the Canal and River Trust. As WRN’s work moves forward, these and other stakeholders such as other environmental organisations, the energy sector, and LEPs, will be engaged in the planning process.

Yorkshire Water first brought WRN together as a group of water companies, with the Environment Agency, in September 2017. We formed the group because we recognised that, in the context of continuing population growth and climate change, and with the background of both Water UK and National Infrastructure Commission reports on the nation’s future water needs, there was an increasing need for companies to think beyond their own boundaries when planning future water resource requirements.

The three core companies in WRN supply drinking water to over 8 million customers, from the southern edge of Sheffield up to the border with Scotland. The area served by WRN covers almost 20,000 km², stretching 320km north to south and 160km east to west. Despite WRN’s large area, there are only five Water Resources Zones defined in the region. Indeed, 98.3% of the region’s population is supplied by just two zones: Kielder (NWL, 32.4%) and Grid (YW, 65.9%). The remaining 1.7% is split across Hartlepool (1.1%), East (YW, 0.3%) and Berwick (NWL, 0.3%).

All five of the Water Resource Zones are highly resilient to drought. Both of YW’s zones already meet the emerging national target of 1 in 500 resilience to Level 4 drought restrictions. NWL and HW have not yet fully modelled their systems to that level, but WRMP19 indicates significant surpluses in all WRZs over at least the next 25 years, even in baseline scenarios.

WRN’s priorities

Recognising that our region’s public water supplies are already highly resilient to drought, WRN’s priority over the next few years is to understand what role, if any, we can provide in supporting national water resources resilience. In addition, we will be engaging with other sectors to understand what their future water demands could look like and how we can work together to

ensure that our region remains resilient to drought not just for public water supply, but also for the broader economy and the environment.

In order to help understand what role we may have in supporting national water resources resilience, we are proposing to carry out a number of strategic studies into possible water transfers. Five studies have been identified, focussed on options for using Kielder Reservoir to supply into other companies' areas, the potential for east-west trans-Pennine connections, future arrangements for supplies in the South Yorkshire area, which currently relies on imported water from STW, the sustainability of abstractions in the Idle and Torne catchment, and the potential for an interconnection between YW and AW grids in the Humber area.

In some cases – for example Kielder – these will build on work previously completed for individual company WRMPs. In other cases, they will complement investment that is planned for AMP7, such as Anglian Water's proposed grid extension into north Lincolnshire.

While one rationale for these studies is to consider future options to maintain resilience within our region, the larger ambition is to understand whether one or more of the options could facilitate the displacement of water further south in order to support national water resources resilience.

For us to realise the ambition for WRN, it will be necessary for resources to be made available, requiring funding from WRN members. In other regions, regional groups were allocated funding for scheme development through Ofwat's Initial Assessment of Plans and / or at Draft Determination. WRN's potential transfer options are not yet mature enough for inclusion in the gated process. However, companies are committed to delivering the required WRN activity through AMP7.

All of the identified schemes involve YW as either an importer or exporter and we are therefore contributing to all five studies. The total AMP7 funding request is for £0.408m to develop the schemes outside of the gated process. The cost will be evenly proportioned over years 1 and 2 of AMP7. In addition, YW has made an upfront commitment of £7,500 to develop scopes for strategic studies before the start of AMP7, in order to allow for a timely start to more detailed work from April 2020.

Summary

Yorkshire Water is including a request for funding related to strategic regional water resource development in its August 2019 Business Plan submission. This funding will be used to develop schemes as part of WRN outside of the gated process. The request for £0.408m is included as a freeform enhancement cost line named 'Strategic regional water resource solutions' in table WS2. The costs are spread evenly between years 1 and 2 of AMP7. This funding will be used to identify feasible schemes that will enable the transfer of water from the North to the East, West and Midlands, which could potentially enable transfers further south.

Bioresources fixed and variable costs

Ofwat feedback

The proposed split of fixed and variable revenues for the bio-resources revenue control has not been sufficiently evidenced, particularly where cost lines are partly incremental and partly fixed. We are also intervening to ensure that the bioresources revenue adjustment is set on a broadly comparable basis to avoid setting revenue controls that may distort the development of trades. We will set out our view in the draft determinations based on the updated tables Bio1, Bio3 and Bio4. We will treat the funding of the 2020 RCV (run-off, returns and tax) as fixed for these purposes, along with revenues to recover local authority rates; some fees; and a proportion of direct and indirect costs of bioresources treatment and transport.

Summary of company response to action

We issued an industry query response in March 2019 setting out further details about the broad approach to be followed consistent with the methodology that was applied to the fast track companies. Yorkshire Water sets out its approach, along with other companies and we have reviewed this evidence.

Our Assessment and Rationale

We are intervening because our assessment of the companies' business plans revealed an inconsistent approach between companies in their calculation of the bioresources revenue requirements to recover fixed and variable costs. This resulted in a wide range of suggested splits between the fixed and variable revenue component. As with fast track companies, a consistent approach to the fixed/variable split is essential to ensure that the company is correctly remunerated by our modified average revenue control for outturn sludge volumes that differ from its original forecasts.

Required interventions

We are intervening to set the level of the split between fixed and variable costs. Our detailed approach is set out in 'Our methodology for the classification of bioresources costs'.

Our response

Introduction

This response sets out our position on the split between fixed and variable costs for the bio-resources revenue control and provides additional evidence to substantiate our approach. Whilst we recognise a benefit from a consistent industry approach to recovering fixed and variable costs, we believe that the contractual arrangements, insourcing or outsourcing decisions and type of assets could differ materially between companies resulting in differing fixed and variable cost

bases. As part of the response following the IAP process, we provided a summary of upstream services costs within bioresources analysed into fixed and variable costs, which determined the revenue split between fixed and variable. The review was carried out on an individual basis using each general ledger code and the type of contracts or arrangements in place. The nature of each upstream service within bioresources differs, and our review concluded significantly different results between service, especially where industry decisions differ on outsourcing and insourcing of activities within the bio-resources activity.

Our approach

There is considerable variance across the industry in terms of fixed and variable proportions. We have tried to detail the evidence in our response of how costs are either variable or fixed on a short run marginal basis depending on the financial and operational strategy adopted. We have done this in consultation with contract managers for contracted out aspects of bioresources, technical experts and operational budget managers for operating costs incurred for bioresources sites. A further review of capital expenditure has been carried out with the bioresources asset planning team, considering in depth the potential variability of costs in any anticipated change in short term volumes. Whilst this review has reached the same conclusions as our previous submission, we have included more evidence and reasoning behind our findings to explain our position of where costs are deemed to be 100% fixed, 100% variable or where they are partly incremental and partly fixed.

Evidence

Evidence – Capital expenditure

As previously stated as part of the IAP query response, we would not expect capital costs to fluctuate if the volumes were to vary on a 'short run marginal cost' basis. We understand that it is possible for advanced financial systems to link the throughput of assets to the speed of depreciation, and therefore you could vary the depreciation charge on variable inputs. A company that leased some of their bioresource assets could pay variable charges if such a system was in place. However, Yorkshire Water owns its' tankering fleet and bioresource assets and would not, therefore, be subject to variable depreciation within operating costs. Therefore these costs should be classified as fixed costs.

Capital expenditure would not vary annually due to variations in asset life of large value assets and construction of new assets. Examples of this would include major refurbishment of digestors which are generally included (for financial efficiency reasons) within planned programmes of work, and enhance the life of the asset. We would not postpone a refurbishment because of a temporary reduction in volumes either - fluctuations in volume will not result in changes to capital expenditure. We have tested this with our asset policy team with a worked example to understand whether a

change in the amount of sludge to a site per annum would result in a change in capital expenditure. We reviewed the costs at two sites which have been part of a recent digester refurbishment programme and no savings could be made. This is because the sites have been designed on a volume capacity which accommodates the regions treatment capacity and thus the costs would be the same.

To further evidence that there is no variation in capital expenditure we have reviewed the capital schemes reported in the 2017/18 annual performance report. This did not identify any areas of spend that would fluctuate on a 'short run marginal cost' basis if volumes were to fluctuate on an annual basis.

Examples of schemes that have been investigated are included below (it should be noted that some of these capital schemes span across a number of financial years):

- Knostrop STF Sludge Strategy – a new anaerobic digestion plant was installed at one of the largest co-located bioresources sites. A review of the capital scheme costs has been carried out to test if any of the costs can be deemed as variable. Following the review with the asset policy team and project manager, we can confirm that a reduction in short run volume will not result in any of the capital costs being treated as variable. Therefore, we can confirm that the costs would be classified as fixed costs.
- Bradford Esholt STF flood reinstatement – this capital scheme was to reinstate sludge assets impacted from the December 2015 floods. This scheme has been completed and the costs are final. A thorough review of all costs was carried out in conjunction with the asset planning and asset solution teams. The outputs demonstrated that all costs would remain the same despite any fluctuations in volumes. Consequently, this has demonstrated that all costs associated with this capital scheme are fixed.
- Dewsbury STF Digester Upgrade – this project is associated with upgrading existing anaerobic digesters which have reached the end of their asset lives. Both age and use have contributed to the need to refurbish, and it is not possible to accurately allocate short run changes in volume to this. All costs associated with this scheme (including feasibility) costs have been reviewed. The site has been designed with a capacity to accommodate regional sludge treatment. The asset planning team and project manager have been part of the review and have confirmed that any changes in volume annually would not have changed the capital costs.

The information above verifies that all capital expenditure costs are fixed and demonstrates that this type of expenditure is not variable. Table 14 below summarises the allocations of expenditure under the relevant headings as detailed in the 2017/18 annual performance report:

Table 14– Capital expenditure allocation

Capital Expenditure	Fixed %	Fixed £m	Variable %	Variable £m
Maintaining the long-term capability of asset ~ infra	100%	£0m	0%	£0.0m
Maintaining the long-term capability of asset ~ non-infra	100%	£106.4m	0%	£0.0m
Other capital expenditure ~ infra	100%	£0m	0%	£0.0m
Other Capital expenditure ~ non-infra	100%	£66.20	0%	£0.0m

Evidence - operating expenditure

Operating costs do vary between fixed and variable costs, particularly outsourced contracts when contract mechanisms are based on volumes. Yorkshire Water has historically continued an insourcing strategy for bioresources, with staff contracts aimed to minimise overtime and has its' own tankering fleet. A different strategy could move this mainly fixed cost approach to variable through different approaches such as outsourcing tankering on a contracting arrangement based entirely on volumes. Conversely, our regulatory accounting methodology uses manpower to allocate general and support overheads, which is fixed, but another company could choose to use the volumes of sludge to change this to a variable cost. Similarly, business rates and fleet maintenance and management are classified as fixed costs as they would not vary annually in sludge production and treatment. We have carried out investigations with our contract partners as to whether their costs could be deemed as variable but they have been confirmed as fixed contracted costs.

Evidence – operating expenditure – sludge transport

A detailed review of the operating costs for sludge transport has been carried out and the results are shown in Table 15. We insource this activity and the split between fixed and variable costs can be seen in the table below.

Table 15– Sludge transport operating expenditure

Operating Expenditure - Sludge Transport	Fixed %	Fixed £m	Variable %	Variable £m
External Sludge Tankering	0%	£0m	100%	£1.4m
Fuel	0%	£0m	100%	£0.9m
Fleet maintenance and management	100%	£0.5m	0%	£0.0m
General & Support Expenditure	100%	£1.0m	0%	£0.0m
Other contracted services	100%	£0.2m	0%	£0.0m
Staff Costs	100%	£2.3m	0%	£0.0m

As shown in the table above, almost two thirds of the costs are fixed, however, fuel and external sludge tankering costs are variable as sludge volumes change. Fleet maintenance and staff costs are deemed as sunk costs as we have insourced this activity, therefore these cannot be variable as sludge volumes fluctuate. The element of costs which is spent with external contractors (shown as

external tankering above) is classified as variable as this is primarily used when internal sludge transport resources are not able to cope with the demand of the operational business. The outputs of the review of this upstream service is shown below:

- External tankering is only used when additional volumes of sludge movement are requested from the waste water network plus price control. Whilst we have deemed this as a variable cost, the majority of this cost is incurred due to the reactive issues faced by the operational business. This is acquired separately for each journey and therefore classified as a variable cost.
- Fleet and fuel (for internal vehicles) – The fuel for the fleet would vary depending on the volume of sludge which needed to be transported. We feel this cost would vary with volumes and is then classified as a variable cost.
- Fleet maintenance is scheduled periodically and is a requirement for heavy goods vehicles. It is also important from a health and safety perspective. This cost is classified as a fixed cost as it would be needed regardless of the sludge volumes moved to ensure reliability of the fleet.
- General and support expenditure mainly includes salaries and business support fixed costs such as IT, finance and human resources. These costs are classified as fixed costs and would not change with the levels of sludge volumes. As a result these costs are classified as fixed costs.
- Other contracted services are mostly associated with contractor support for sludge movement at smaller sites. These smaller sites cannot be serviced by the existing internal fleet due to specialist fleet required to access the site sludges. We procured specialist firms to carry this work out for the business and procure via an annual contract. We have discussed the fixed and variable cost element with one contractor who explained that their main costs were the same as Yorkshire Water, with staff and vehicle lease costs the main and fixed cost part of their business. If we contracted short term smaller volumes, the cost per unit would have to increase. These costs are fixed for Yorkshire Water.
- Staff costs – tanker drivers are paid contractual overtime and their average hours per month are set. Salaries and other costs such as national insurance and pension contributions are included within this subjective. These costs would remain fixed regardless of the sludge volumes, and so have been classified as fixed costs.

In summary, we feel strongly that the company cannot be consistent with the draft determination which suggests that all of these costs are variable. The only way we can see that this is possible would be to externally contract the entire function with all volumetric risk being passed to contractors, and contractual arrangements ensuring that vehicle leasing costs are still contracted at a variable rate. In this scenario, we believe that asking contractors to take such a 100% variable volume risk would add further cost into the contract, creating an inefficiency from a desire to create variable costs.

Evidence – operating expenditure – sludge treatment

The upstream service of sludge treatment includes the majority of the costs for bioresources. A detailed review of this has been carried out and the results are shown in the table below.

Table 16 – Sludge treatment operating expenditure

Operating Expenditure - Sludge Treatment	Fixed %	Fixed £m	Variable %	Variable £m
Chemicals	0%	£0m	100%	£3.7m
Fleet and Fuel	94%	£2.5m	6%	£0.1m
General & Support Expenditure	100%	£2.5m	0%	£0.0m
Maintenance	100%	£3.5m	0%	£0.0m
Other Contracted Services	100%	£7.3m	0%	£0.0m
Staff Costs	100%	£8.6m	0%	£0.0m
Power (including income)	8%	-£0.1m	92%	-£1.4m
Local Authority rates	100%	£1.3m	0%	£0.0m

The majority of sludge treatment activity is carried out internally and therefore many costs are classified as fixed costs. However, there are some costs which are classified as incremental and variable due to fluctuations in sludge volumes. The detailed evidence for each subjective is detailed below:

- Chemical costs have been reviewed and the main chemical used in this upstream service is polyelectrolyte which is included in the sludge treatment process. The amount of this chemical being used is dependent on the sludge volume treated, and therefore we have considered this cost as variable. Following the draft determination this has been confirmed with the sludge technical team who have reviewed several sites to test if sludge volumes would classify this cost as variable. It has been concluded that these costs would be classified as variable.
- Fleet and Fuel costs are costs which are primarily associated with operators on site and their fleet requirements. This is a very clear example where we have demonstrated partially fixed and variable costs. Whilst the fixed monthly charge for fleet would not change with fluctuate in sludge volumes, fuel costs would change. Given this part of this subjective is classified as fixed and part of this is variable.
- General and Support expenditure is an overhead cost and mainly consists of salaries and business support fixed costs such as IT, finance and human resources. These costs would not fluctuate as sludge volumes vary and as a result are classified as fixed costs.
- Maintenance costs would not fluctuate with short term volume variations, as this maintenance would be required regardless of the throughput of the assets and is scheduled on a regular basis. This is scheduled maintenance required to ensure optimum performance of the plant, and also includes statutory maintenance which is required whether the plant treats any sludge or not.

These costs are required regardless of short run volume variances and as a result are classed as fixed costs.

- Other contracted services include some mitigation costs from the reactive failure of sludge treatment assets. These mitigation costs have been incurred year-on-year for the last few years of this AMP period, albeit impacting different sludge treatment assets across the region. A review of these costs with operational budget managers has evidenced that these costs have not been incurred due to short run volumetric variations at sites and have therefore been classified as fixed costs.
- Staff costs are a fixed cost and would be incurred regardless of the sludge volume produced and treated. The sludge treatment facilities staff costs are proportioned between waste network plus and bioresources. These also include management costs which are directly associated with bioresources including managers and team leaders.
- Power costs are both partially fixed and variable costs. This subjective cost has been reviewed with energy experts from the waste water technical team. The power costs shown in the previous table are from the 2017/18 annual performance report and include income as a credit associated with the recycled obligation certificate payments. Fluctuation of volumes in sludge would vary the amount of electricity consumed by pumps, thickeners and centrifuges. Whilst the majority of these costs are variable, there are some fixed standing charges associated with electricity which would be common across the industry (the amount of the charge would depend on the electricity contract). These fixed costs are associated with unit prices and arrangements in place for standing charges which are fixed. The fixed costs for power are the standard charges which would be incurred regardless of whether electricity is consumed or not. These fixed costs equate to 8% of total costs, with the remainder 92% of costs being variable with sludge volumes.
- We agree with the conclusion that local authority rates should be classified as fixed. These costs are calculated using sludge treatment assets and rateable value. These costs are determined by the valuation office authority and are fixed at the beginning of a revaluation period.

Evidence – operating expenditure – sludge disposal

The third upstream service of bioresources is sludge disposal. This part of the business is closely monitored by authorities such as the Environment Agency. A strict sampling regime is carried out to ensure all sludges disposed are compliant. A summary by subjective as carried out for other upstream services is summarised in the table below.

Table 17 – sludge disposal operating expenditure

Operating Expenditure - Sludge Disposal	Fixed %	Fixed £m	Variable %	Variable £m
EA Charges	100%	£0.3m	0%	£0.0m
General & Support Expenditure	100%	£0.5m	0%	£0.0m
Other Contracted Services	100%	£0.1m	0%	£0.0m
Sampling Costs	100%	£0.6m	0%	£0.0m
Sludge Disposal contract	77%	£3.4m	23%	£1.0m
Sludge handling costs	100%	£2.4m	0%	£0.0m
Staff Costs	100%	£0.4m	0%	£0.0m

A review of each subjective to demonstrate how they have been classified as fixed or variable costs is listed below:

- The Environment Agency (EA) costs are associated with permits for sites and are paid annually. These fees would not vary if sludge volumes were to fluctuate in the short term. As a result these costs are classified as fixed costs.
- General and Support expenditure is an overhead for this upstream service and consists of salaries and business support costs which are fixed. Examples of these costs included here are IT, finance and human resources.
- Other contracted service costs are associated with deployment fees. Sludge disposal requires land bank on an annual basis. This cost is to understand land bank requirements and sludge types that can be disposed there. Any changes in short term volumes would not change the land bank requirements and thus this cost has been classified as a fixed cost.
- Sampling costs are contracted out as a fixed contract and is managed by a third party. This is a contract which is agreed at the beginning of the financial year providing an indication of volume at the beginning of the year. Any small changes in volume would not impact this service, and any short run variation in volumes would not impact the contract and hence this is deemed as a fixed cost.
- The sludge disposal contract has been reviewed again after the draft determination. Given that this is the majority of the cost in this upstream service and is contracted out to a third party, we have engaged the service provider to further understand these costs. They described fixing a significant amount of cost based on the indicated volumes we provided them at the beginning of the contract, and accordingly have resources such as staff, management and fleet which are all fixed costs. Whilst an element of the haulage costs can be deemed as variable there are not many other costs that can be classified as variable. Following this consultation and detailed review, only 23% of these total costs can be classified as variable and the remainder would be fixed.
- Sludge handling activities are contracted out, with the costs involved mainly being loading staff and machinery required on site. We have consulted with the contractor who carries out this work to further understand how these costs can fluctuate with volumes. We used the following

scenario of two full time resources required at our main site Knostrop along with the machinery who support loading on average nearly 200 wet tonnes of sludge per day. If this volume was 160 wet tonnes or 240 wet tonnes per day the cost would not differ as it requires the same staff and machinery. Consequently, these costs are classified as fixed.

- Staff Costs in this upstream service are minimal and exist mainly to ensure compliance of sludge disposal including management. As the need to ensure compliance and incur in this cost is not affected by short term fluctuation in sludge volumes, this cost is deemed to be a fixed cost.

Summary of views expressed

We recognise the theoretical benefit of a consistent industry approach to recovering fixed and variable costs but we believe that the specific contractual arrangements, insourcing or outsourcing decisions and type of assets could differ materially between companies, making that consistent approach impractical and inaccurate. Yorkshire Water insources tankering and designs contracts and costs to be as efficient as possible, which is not necessarily as variable as possible. Our contract partners rely on our volumetric assumptions to scale resources efficiently and would choose different options were volume to be a risk. For example, sludge disposal has scaled third party operations to be most efficient at our forecasted volumes, and unit prices would actually increase were volumes to decrease. Another example would be the number of vehicles contracted on long term leases at a reduced price compared to the more expensive short-term equivalent. High variable cost proportions could increase the costs into areas such as sludge transport as the volumetric risk would be priced into third party contracts.

Consequently, our review and presentation of additional evidence has reached the same conclusion as our previous submission as to which costs within the bio-resources revenue control are deemed to be fixed or variable, or indeed a combination of the two.

Hull and Haltemprice Resilience Investment

Hull and Haltemprice are at risk from extreme flood events and have the highest total flood risk envelope outside of the Thames Estuary with communities here amongst the most vulnerable to climate risks in the UK. The combination of topography, geography and an interconnected drainage system makes the area unique in terms of flood risk.

The solutions required to make Hull and Haltemprice more resilient to flooding are far greater and more complex than anything we have ever delivered. These solutions are required for us to ensure we deliver the same level of service as we do to other parts of Yorkshire. Ofwat's Internal Sewer Flooding performance commitment includes severe and extreme weather, this is something we have not previously had to manage and something we have not traditionally invested in to resolve. In Hull, our ability to deliver this level of service is significantly impacted by the atypical nature of the city. Key features include:

- Unusual Topography
- Complex and Integrated Drainage System
- Challenging Environment for traditional Sustainable Drainage System features
- Socio Economic Status
- Disproportionate risk of flooding

In response to these factors a pioneering approach was developed and the “Living With Water Partnership” formed (www.LivingwithWater.co.uk). The Living with Water Partnership is a blueprint for resilience and social contract and showcases a way of working that would be relevant to all catchments in Yorkshire.

Our investment in AMP7 for Hull specifically delivers blue-green infrastructure, it relies on partnership working and our ability to secure different types of funding (match funding). This initial £28.6m investment is the start of our journey for the Living With Water partnership and is critical to its broader success and specifically relates to increasing resilience not just to flooding but also by enhancing Natural and Social Capital.

As set out in [Not Just Water - Our Strategic Direction](#), feedback from our customers and other stakeholders emphasises that we must deliver our core services differently, focusing on a holistic and sustainable approach. We have made significant steps in understanding the broad range of impacts that our activities have. This has been achieved through both the implementation of our [Six Capitals Approach](#) and our [Total Impact Value Assessment](#).

We have recently submitted a document to Ofwat in response to an IAP identified action ref: Our response to securing long term resilience relating to Ofwat's IAP action YKY.L2.A2. This document

details our systems-based approach to resilience in the round and demonstrates our approach to an integrated resilience framework that underpins the company's operations and future plans. It also demonstrates a line of sight between risks to resilience, planned mitigations, package of outcomes and corporate governance.

As set out in the above referenced submission, the investment is to begin to address historical resilience issues that exist independently of any estimated growth in the region. The specific solutions in our plan have been prioritised as they are the most efficient means of achieving multiple benefits, for example service improvements and resilience benefits. This proposed investment in Resilience (Hull) is not related to an increased hydraulic risk due to population growth, so shouldn't be considered alongside the growth allowance in the Botexplus modelling. Ofwat should make a separate allowance for this expenditure on the grounds of resilience.

Case Study Two – Living with Water Partnership; Water Resilience in Hull and Haltemprice

For a number of years we have been building a collaborative, resilience based approach to addressing the risks of flood risk in Hull and Haltemprice, through the development and activities of the Living With Water Partnership. We have taken a pioneering approach in Yorkshire which focusses on Hull and Haltemprice for the following reasons:

- Hull is at risk from flood events at multiple rainfall frequencies and from multiple sources.
- Has the highest total flood risk envelope outside the Thames Estuary.
- Communities here are amongst the most vulnerable to climate risks in the UK.

The risk in Hull and Haltemprice is greater than other areas of our region due to both physical geography and socio-economic factors, which mean that communities in Hull are less equipped to respond and recover to significant shock events, such as flooding.

Within our PR19 plan, the activity delivered in Hull and Haltemprice will contribute to service improvements in the following areas:

- YKY_31 Internal sewer flooding
- YKY_35 External sewer flooding
- YKY_37 Surface water management
- YKY_07 Education
- YKY_01 Working with others

Topography

The topography around Hull and Haltemprice form a landscape like a bowl which inhibits the natural flow of surface water to the estuary. Parts of the River Hull and Holderness Drain are higher than

the land to either side and the reclaimed land near the waterfront is higher than that to the north. Over 90% of the City of Hull is below sea level at high tide.

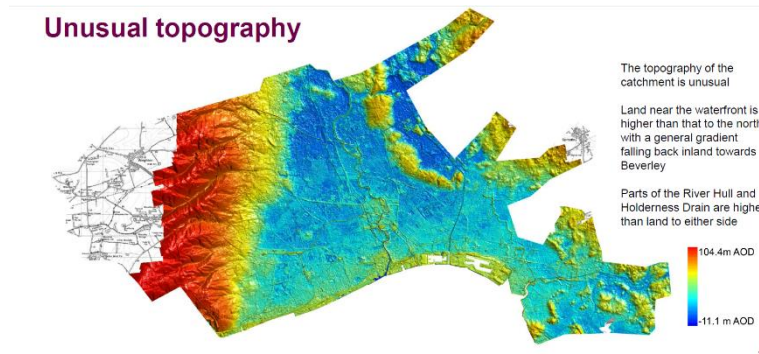


Figure 10 Map showing height of land in Hull and Haltemprice (low lying areas are shown in blues; note that the rivers and coastal frontage are generally higher than surrounding land)

Complex and integrated drainage system

A high proportion, 88%, of surface water flows from Hull and Haltemprice enter the combined sewer network. Most sewerage systems in the UK use rivers and watercourses to relieve pressure on the system in wet weather, allowing water to escape which alleviates property flooding. In Hull there are no relief points on the drainage network and increased pressure comes from both the topography of the catchment and the historic introduction of several significant watercourses into the sewers. All flows entering the sewer network, must be pumped out of the city.

Challenging environment for traditional Sustainable Drainage System (SuDS) features

A combination of soil type and high groundwater level means that infiltration is often not practical in Hull and Haltemprice. Impervious clay soils, few surface water systems into which SuDS features could drain and limited land all impact significantly on the viability and cost of SuDS implementation. Archaeological significance and a history of contaminated land are also known to drive higher costs of development in Hull and Haltemprice.

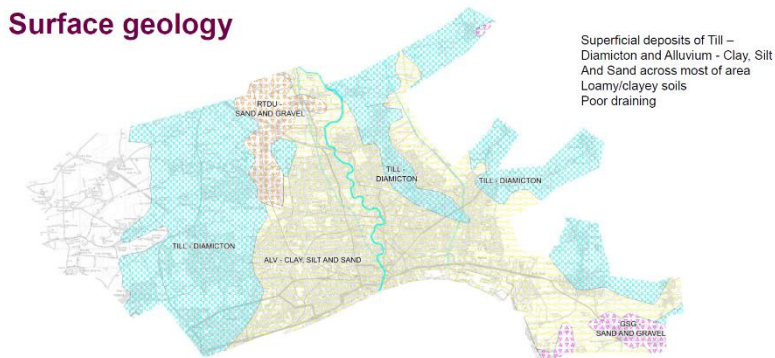


Figure 11 Surface geology showing extent of clay soils (in off white)

Socio-economic status⁷⁴

In 2015, Hull was identified as the third most deprived Local Authority (LA) area in the UK. The average Gross Disposable Household Income (GDHI) is equivalent of £13,380 per head, compared to £16,365 per head regionally and £19,878 nationally. This makes communities less able to access flood mitigation measures and to respond and recover when flood events occur.

The Humber is the largest trading estuary in the UK (by tonnage) and the fourth largest in northern Europe, *Avello et al (2019)*⁷⁵, with 14% of UK international trade handled by Humber ports (CWRF, 2018)⁷⁶. The Humber ports supported more than 23,000 jobs in 2018. According to Hull City Council; the management of flood risk is a key factor in attracting and retaining large businesses to Hull. When considering the resilience risks in Hull associated with Flooding, impacts can be far more wide reaching than the city or the region; disruption caused by flooding can lead to impacts on the distribution of supplies to the NHS, 90% of UK NHS medical supplies come from Hull (CWRF, 2018).

Disproportionate risk of flooding

Hull and Haltemprice have a disproportionate flood risk when compared to other major populations in Yorkshire. Table 1 shows results from advanced modelling, that highlights the scale of surface water flood risk in Hull and Haltemprice during a 1 in 30 year rainfall event. Over 7% of the population (circa 22,000 properties) are impacted during an event of this return period.

⁷⁴ Ramsden, S (2019) *Living with Water 2018 Baseline*. University of Hull, Hull.

⁷⁵ *City Water Resilience Approach: City Characterisation Report Hull*. Arup, SIWI, The Resilience Shift, The Rockefeller Foundation, London

⁷⁶ *Simkins et al (2018) Hull CWRF Background Report*. Arup, SIWI, The Resilience Shift, The Rockefeller Foundation, London

Table 18 Comparative flood risk in Hull compared to other regional cities

Location	Population	Number of Properties Predicted to Flood in a 1in30 year rainfall event	Percentage of Population	Sewer Length (km)	1in30 year risk/sewer length ratio
Leeds	800,000	9511	1.19%	3561	2.7
Sheffield	580,000	5660	0.98%	2366	2.4
Hull	300,000	22035	7.35%	1677	13.1

In summary, there are a number of factors that make the resilience challenge in Hull, greater than in other areas of our region:

- Topography.
- Geology.
- Multiple flood risk sources – fluvial, pluvial, tidal, ground water.
- Socio-economic status.
- Interconnected drainage system.

In response to these factors a pioneering approach was developed and the ‘Living With Water Partnership’ formed (www.LivingwithWater.co.uk). The Living with Water Partnership is a blueprint for resilience and social contract and showcases a way of working that would be relevant to all catchments in Yorkshire.

Annex 3 of our IAP response YKY.LR.A2 contains further information on some of the projects that the Living with Water Partnership have delivered in order to enhance community resilience to flooding through education; cohesion and global collaboration and learning. The partnership continues to work towards developing and delivering physical interventions to reduce flood risk. It is recognised that given the complexity of the flood risk factors, the suite of solutions required is also likely to be complex and therefore more likely to be successful if the interventions are integrated into the fabric of the city and our partners long term plans. This means that the communities will be closely involved in the development and deployment of interventions as well as integrating flood risk reduction interventions with those focussed on housing, transport, growth and place making. Therefore, having a set of adaptive and flexible solutions means that benefits can be maximised when opportunities to deploy become available, potential triggered by a complementary intervention such as regeneration. Collaborative delivery of flood management facilitates industry-leading opportunities to maximise broader benefits, interdependencies between systems and financial efficiency across city and regional responses. Joint-funded and multi-benefit projects and Living with water sponsored schemes have today returned a matched funded ratio of 4:1.

Sharing insight, understanding and development of solutions across regional flood authorities allows both social and economic improvement to be considered alongside potential flood alleviation schemes. This in turn allows the opportunity to positively enhance local policy development (including planning and development legislation), shared resource efficiencies (watercourse maintenance & joint-commissioning) and long-term regeneration planning with flood resilience retained firmly as a central pre-requisite concept.

Annex

Annex 1

Business rates emails

Summary details of the correspondence with the VOA confirming time limited reduction

From: Smith-Shaw, Adrian A [mailto:adrian.a.smithshaw@voa.gsi.gov.uk]
Sent: 14 May 2018 17:21
To: Clapham Mark
Cc: Ruben, Peter
Subject: FW: 2017 Central Rating List Assessment : Yorkshire Water Supply Network

Dear Mark

Thank you, I will arrange for the Rateable Value to be reduced to the agreed figure of £80,000,000.

The assessments agreed since the list came into force are South West, South East, Southern and Sutton & East Surrey. For these companies, I have been given detailed calculations showing the valuation of tenant's assets built up from the C11 base *less* depreciation *plus* maintenance (MNI) and enhancement *plus* RPI. Neil has said that this was also Yorkshire's approach. One company has made calculations drawing on their fixed asset register but the assessment has not been agreed because of other unrelated issues.

Some companies, including Yorkshire provided valuations of tenant's assets at the Revaluation and we did not have full workings. Companies had been invited to provide the valuations on the basis that they were their assets and they therefore had the best information on them. As companies worked independently of each other there will

1

inevitably be differences in approach but they are all on the basis of the net MEAV (of the "tenant's assets"). It was however evident that companies had mainly worked from a C11 base and one company had again made reference to their fixed asset register. We did ask that figures we were given be soundly based as the VOA may subsequently use external bodies for sophisticated audit. Some companies did not provide anything meaningful and our original trial figure was therefore used in the compiled list assessment.

(For the avoidance of doubt, I think just a typo, you mean YW's in your email rather than TW's?)

Regards

Adrian

Adrian Smith-Shaw | Utilities & Transport Team | Valuation Office Agency (VOA)
Darwin House | 2 The Mount | Shrewsbury | SY3 8PU | Telephone: 03000 500 891 | Mobile 07795 302563
|
Email: adrian.a.smith-shaw@voa.gsi.gov.uk



Stephen Webb BSc Hons MRICS CDipAF
Head of Utilities & Transport Team
National Specialists Unit
Valuation Office Agency

Darwin House
2 The Mount
Shrewsbury
Shropshire
SY3 8PU

Tel 07795 302563 / 07769 234553

E-mail adrian.a.smith-shaw@voa.gsi.gov.uk

Please ask for : Adrian Smith-Shaw / Peter Ruben

Date : 29th March 2018

By email

Mark Clapham BSc MRICS IRRV
Regional Head of Division - Rating - Central
Lambert Smith Hampton
Interchange Place,
Edmund Street,
Birmingham
B3 2TA

Dear Mark

Uniform Business Rates Revaluation 2017
Central Rating List
Yorkshire Water Services Limited

I refer to our email exchange earlier today. I confirm that I have recommended to the Central Valuation Officer that this matter be agreed at Rateable Value £80,000,000, effective date 1st April 2017, for Yorkshire Water Services Limited's water supply hereditament as described in Part 10 of the Schedule to the Central Rating List (England) Regulations 2005.

I understand that Neil Pinner is also prepared to recommend this figure to his Board. If you or Neil can please advise me of their agreement I shall arrange for the existing entry in the Central Rating List to be altered accordingly.

Yours sincerely,

Adrian Smith-Shaw.

Adrian A W Smith-Shaw MRICS IRRV(Hons).
Principal Valuer

Annex 2

Current period asset extensions and those expected in the following and current period to April 2020.

Additional business rates liability arises from new ‘hard’ civil assets. For example, concrete filtration structures, buildings, tanks, roads that are constructed to meet new environmental compliance standards or growth requirements at specific sites. Such sites have been identified as part of agreed AMP programmes and funded through price review. The business rates liability commences from the date these assets are brought into operational use.

Yorkshire Water are still completing new assets or asset extensions in the AMP6 programme, whilst other assets have been completed and are awaiting inspection valuation and introduction into liability by the Valuation Office.

Rates - DD resubmission working doc		
TABLE : Sites where liability is due to be increased. Valuation Office has notified requirement to make an inspection - site visit yet to be made.		
Site: WWTw	[REDACTED]	Liability will date from:
Appletreewick WWTw	[REDACTED]	1st April 2017
Malham WWTw	[REDACTED]	1st April 2017
Grassington WWTw	[REDACTED]	1st April 2017
Normanton WWTw	[REDACTED]	1st April 2017
Knostrop AD	[REDACTED]	1st October 2018
Beverley WWTw	[REDACTED]	Date of completion
Dronfield WWTw	[REDACTED]	Date of completion
Clayton West WWTw	[REDACTED]	1st April 2017
	[REDACTED]	total excluding TBA

TABLE: AMP6 asset Extensions not yet in rates liability.		
Site WWTw	Estimated annual liability at 19/20 £ prices:	Liability will date from:
AMP6 Lindhome Serviceability	████	Estimated 20/21
Del - Carlton Husthwaite RBC Replacement	████	Estimated 19/20
AMP6 Hull Odour Delivery	████	Estimated 19/20
Appletreewick STW - undersized works	████	Estimated 19/20
Knostrop STF Sludge Strategy	████	Estimated 19/20
Knostrop Decommissioning	████	Estimated 19/20
Stocksbridge WwTW Relocation	████	Estimated 19/20
Clayton West STW WFD NEP5 Ammonia	████	Estimated 19/20
Tankersley STW WWQ WFD No Det	████	Estimated 19/20
Thorpe Arch STW Unsafe Assets	████	Estimated 19/20
Dronfield STW STQ WFD NEP Phase 5	████	Estimated 19/20
AMP6 ES FFP 1b Beverley STW	████	Estimated 19/20
AMP6 Yr2 Patrington STW Lack of capacity	████	Estimated 19/20
AMP6 Yr2 Sheburn in Elmet STW No Det	████	Estimated 19/20
Metal Tank Structural Failure Ripon STW	████	Estimated 19/20
AMP6 Del Embsay STW - Nomenca	████	Estimated 19/20
AMP6 Yr2 WFD no det Wath Ripon	████	Estimated 19/20
Lundwood STW STQ WFD NEP Phase 5	████	Estimated 19/20
AMP6 Denholme STW. NEP Phase 5	████	Estimated 19/20
BBM STF - Cake Import Facility	████	Estimated 19/20
AMP6 Slingsby STW primary tank	████	Estimated 19/20
AMP6 Welburn STW primary tank	████	Estimated 19/20
AMP6 Yr2 Tollerton STW NEP Phase	████	Estimated 19/20
AMP6 Yr2 Thornton Le Dale STW	████	Estimated 19/20
AMP6 Easingwold STW NEP P5	████	Estimated 19/20
AMP6 Wetherby STW NEP P5	████	Estimated 19/20
AMP6 Skipton STW NEP P5	████	Estimated 19/20
AMP6 Crayke STW NEP	████	Estimated 19/20
Snaith STW Tank Refurbishment	████	Estimated 19/20
AMP6 Leeming Bar STW NEP	████	Estimated 19/20
AMP6 Borrowby STW NEP	████	Estimated 19/20
AMP6 Otley STW NEP P5	████	Estimated 19/20
AMP6 Bedale STW NEP P5	████	Estimated 19/20
Leven STW Ammonia Quality Scheme	████	Estimated 19/20
Cherry Burton STW Ammonia Quality Scheme	████	Estimated 19/20

West Bretton STW Ammonia Quality Scheme	██████	Estimated 19/20
AMP6 Earby STW NEP P5	██████	Estimated 19/20
AMP6 Thirsk STW NEP P5	██████	Estimated 19/20
AMP6 Gargrave STW NEP P5	██████	Estimated 19/20
AMP6 Middleton Tyas STW NEP P5	██████	Estimated 19/20
AMP6 Thorp Arch STW NEP P5	██████	Estimated 19/20
AMP6 Wilberfoss STW NEP P5	██████	Estimated 19/20
AMP6 Foulridge STW NEP 5	██████	Estimated 19/20
AMP6 Y4 Driffield STW Insufficient treatment	██████	Estimated 19/20
Tophill Low Visitor Centre, Driffield	██████	Estimated 19/20
Naburn Acoustic Wall	██████	Estimated 19/20
Rillington STW Settlement Tanks	██████	Estimated 19/20
	██████	total excluding TBA

.

YORKSHIREWATER.COM

Yorkshire Water Services Limited, Western House, Halifax Road,
Bradford, BD6 2SZ. Registered in England and Wales No.2366682

