PR24

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DRAFT DETERMINATION - REPRESENTATIONS

NES80

1. EXECUTIVE SUMMARY

1.1. WE ARE PLEASED THE DD RECOGNISED THE QUALITY AND AMBITION IN OUR PLAN

1. We set out an ambitious and stretching Business Plan for the 2025-30 period last October to make sure we can retain and improve the trust of our customers and communities. We could not see other water companies' plans when we submitted our own, but we now know that in comparison our plan was:

   - **High quality** – we passed the stringent tests that Ofwat applied to company business plans in the 2024 Price Review (PR24).
   - **Efficient** - our modelled base costs were within 3.3% of Ofwat's allowances for the Draft Determination[1] (DD) and we offered the largest frontier shift efficiency improvement[2] of the Water and Sewerage Companies, reflecting our industry leading position on innovation. Our modelled enhancement costs were within 0.1% of Ofwat's cost allowance and our cost estimates for our allowances are largely[3] consistent with Ofwat's models.
   - **Offering stretching levels of service improvement to customers and the environment** – where Ofwat rightly assessed our ambition as 'high' and we have seen only minor adjustments to the service levels that we offered.

2. Overall, our plan represented over £6bn of investment, more than 93% of which has been funded by Ofwat in the DD, including a ten-fold increase in investment to improve the environment with almost £1bn of investment to reduce spills from Storm Overflows and bring the number of average spills down to one of the lowest in the sector. Ofwat has approved 97% of that investment in the DD.

3. It would also result in one of the lowest overall increases in bills across the sector[4] and the lowest combined bill in England and Wales. Our October business plan would have led to an average bill increase of around 16% across our operating areas. This increase is substantially mitigated by the 18% bill reduction we delivered in 2020/21, which was the largest reduction in the sector at the time.

4. We also offered a large affordability package for our customers including a four-fold increase in our support package and £20m of additional support from our shareholders, alongside a commitment to ensure that no household spends more than 5% of their income on their water and sewerage charges by 2030. That was recognised by CCW in its review of business plans[5] which was also complimentary about how we engaged with our customers to understand their views and preferences as well as our affordability support.

[1] See section 7.1.
[2] See section 7.1.
[3] See section 7.2.
[4] Ofwat DD key facts
[5] CCW assessment of business plans

1.2. CUSTOMER RESEARCH AND EVIDENCE HAS NOT PLAYED AS BIG A ROLE IN THE DD AS IT SHOULD HAVE DONE

5. We were disappointed that Ofwat has not considered our customer research across most of the plan, or how we had taken this into account in developing our business plan (for example, how investments should be phased over time; or the principles of how investment should be selected). The DD says very little at all about the research companies (or Ofwat) did with customers making it very difficult to draw a clear link or 'golden thread' between the DD package and what customers' wanted.

6. Ofwat's quality assessment of companies' business plans did include explicit tests around the extent to which companies had engaged with their customers to understand their needs and priorities. With four tests focussed upon 'customer engagement, affordability and acceptability' out of 24 total quality tests. However, based on Ofwat's assessment scores in the DD, companies only needed to pass 16 out of the 24 tests to 'pass' the high-quality plan assessment. This means that a company could fail all four of these tests, having done no engagement with its customers at all and, provided they passed other tests, they would still 'pass' the assessment as producing a high-quality plan. This doesn't appear sensible.

7. Moreover, the assessment feedback was extremely limited, for example on one of these tests the only feedback NWL received was that:

> 'The company engaged with current and future customers on a wide range of topics. It conducted research broadly in line with our minimum expectations to capture customers' opinions and preferences. Northumbrian Water shared its research on its website. However, some materials could have been more neutral' Ofwat QAA feedback

8. Ofwat's feedback amounts to four sentences in response to years of time, effort and work to properly engage with, understand and reflect customer views on the business plan.

9. Since Ofwat broadly agreed with our business plan in most areas – this oversight has only had a minor impact, but this is pure serendipity, and it is unlikely to encourage companies to engage more with their customers if this evidence is not given any weight in the price review process. We note that Ofwat has a clear duty to protect customer interests, hard to do this without proper consideration of what they are. This was a key point that the Water Forum made to our board in the review that they have undertaken on our proposed approach to responding to the Draft Determination.

10. The largest differences between the DD and our business plan are in relation to asset health and climate change adaptation, where Ofwat did not consider the evidence about when and how our customers would prefer to make these investments – and this was a very important part of our decision to include these investments in our business plan now, rather than delaying. Ofwat should consider this evidence more fully at DD.

1.3. WE WELCOME MANY ELEMENTS OF THE DD

11. We welcome most of the elements of Ofwat's DD, and we have reflected many of Ofwat's challenge in our response. In particular:

- Ofwat has supported most of the **cost allowances** and **service level** targets that we included in our Business Plan.
- Ofwat has recognised that the **overall balance of risk** was heavily skewed to the downside in PR19, preventing even an efficient company from achieving its base allowed return. In response, Ofwat has introduced a range of additional risk protection mechanisms focused on costs. Many of these mechanisms closely resemble those that we included in our Business Plan.
- Ofwat has increased the **allowed return** from its 'early view', adjusting for movements in market data and 'aiming up' within its stated cost of equity range.

12. Ofwat has challenged our Business Plan in several areas, including the use of benchmarking data from other companies plans that was not available to us at the time of our submission. Based on this new information, we acknowledge and accept the DD challenge in several areas. We accept:

- The **modelled base cost allowances for PR24** as set in the DD, and we make no significant representations on the models used or the individual cost drivers.
- Ofwat's adjustments to most of the **Performance Commitment targets and profiles** that we included in our plan, including PCs for wastewater (including internal and external flooding, serious pollutions, river water quality, sewer collapses, Discharge Permit Compliance, and greenhouse gas emissions) and water (Compliance Risk Index, water quality contacts, interruptions to supply, leakage, mains repairs and greenhouse gas emissions).
- Some of the **challenges to our enhancement programmes based on Ofwat's benchmarking**, including adjustments to our allowances for wastewater monitoring programmes and our sludge barn investments.

13. We have taken the opportunity to strengthen our PC targets for reducing spills from storm overflows so that they now match the most ambitious in the sector.

1.4. OFWAT SHOULD MAKE FIVE KEY CHANGES IN ITS FINAL DETERMINATION IN DECEMBER

14. Although we welcome many elements of the DD, if the Final Determination (FD) were unchanged from the DD then we **could not accept it**. The DD is unlikely to serve the long-term interests of current and future customers, for two reasons.

15. Firstly, Ofwat has removed the funding needed to make the necessary investments that we described in our Business Plan to make sure our **asset base is healthy** and able to operate effectively, and to mitigate the **risks from climate change** and extreme weather events. These investments are **necessary to ensure that the**

business is resilient and able to meet future challenges, and the evidence from our customers and Water Forum members[6] shows that they support taking action on these issues now rather than delaying.

16. Secondly, **the package is not financeable** Ofwat has introduced a range of **true-up mechanisms that leave the sector underfunded for the efficient costs and which drive a deterioration in the credit rating of even the notional company**, the proposed **cost of capital** is not sufficient to attract the investment needed, given the risk that equity shareholders would need to take. The **overall balance of risk in the package is heavily skewed to the downside** unless it is amended it will be too stretching driving material penalties for all companies, repeating a mistake from PR19.

17. To improve these outcomes for customers, we ask Ofwat to look again at **five areas** (the balance of risk in the package, financeability including its true-up mechanisms, investability, asset health, and climate change adaptation). We provide new and updated evidence in sections 2 to 1, including some possible changes that could be made to address issues across these areas. We summarise this in sections 1.4.1 to 1.4.5 below.

1.4.1. Balancing the risk in the package

18. Ofwat should recalibrate the **risk and return package** across the settlement, to ensure that an efficient and high performing company like Northumbrian Water can at least achieve its base allowed return at the P50 level.

19. Ofwat has included a wide range of cost risk mitigations in the DD and presents its view that the range of risk outcomes for the DD are symmetrical across costs, performance incentives and financing. We welcome these cost risk mitigations. However, this analysis is not correct, and the range of risk outcomes is **not symmetrical**. In section 2, we show that there is a significant downside risk for all companies under the package proposed at DD – our analysis shows that we would expect around a 97bps penalty (at P50) from the incentive package alone. This is because of the level of stretch Ofwat has applied to some efficiency and service improvements, and the asymmetric nature of some incentives (which means companies would expect a net penalty).

20. We are happy to accept the costs and outcomes we put forward in our Business Plan, including the areas of challenge from Ofwat's DD (see section 1.3) – we proposed a plan with some skew towards downside risk. However, we would not be able to accept the package put forward in the DD, because this would leave us (and therefore certainly the notional company) with an unacceptably high level of downside risk. As Ofwat recognises, it is important that the range of risk outcomes is symmetrical and that this matches the base allowed return at the P50 level.

21. In section 2, we make some targeted suggestions about how this imbalance could be corrected.

[6] See NES47 Water Forum Report and PR24 Research and Engagement Activities (nwg.co.uk)

1.4.2. Ensuring that the package is investable

22. The proposed cost of capital is not sufficient to attract the investment needed, given the risk that equity shareholders would need to take.

23. Ofwat should set the nominal cost of equity to be at least **7.5%**, compared to the 6.9% proposed in the DD. This allowed return would be consistent with a simple roll-forward of the methodology applied by the Competition and Markets Authority (CMA) in its 2020/21 redeterminations, following the longest and most detailed consideration of these issues since the privatisation of the water sector.

24. Ofwat's proposed equity return in the DD is only 80 to 100 basis points higher than the return that investors could earn by putting their money into an investment grade bond (which have much lower risk). It is at the lower end of Ofwat's own cross-check of Market to Asset Ratios (MAR)[7], and it is less than the allowed return in energy networks by 25 basis points.

25. Our proposed nominal cost of equity would still fall at the lower end of the equity return range suggested by independent advisors at KPMG, who suggest a range between 7.1% and 8.6%. Since the risk in the sector is increasing, this is the minimum required to have confidence that the sector will be able to attract the equity capital it needs to deliver the planned investment.

26. In the past, regulators have "aimed up" as a matter of policy because the harm to customers of not receiving the investment needed is generally much greater than the harm of paying slightly too much for it. There is no reason to artificially force down the allowed return at the same time that the sector needs to raise so much new equity – and at a time when the investment model is changing so substantially and risk is clearly increasing.

27. We provide more evidence on this point in section 3 of this document.

1.4.3. Supporting financeability by amending its true-up mechanisms

28. The DD contains a range of 'true-up' mechanisms (for example, for business rates, power costs and 'gated' investment) these mechanisms collectively create financeability constrains on the notional company causing it to drop a rating. We do not understand why these mechanisms are needed as the costs in these areas are known with a high degree of certainty.

29. In our case, the end-of period adjustments will increase PR24 bills by c.10% - we do not think this is in customers interests and it doesn't meet the financing duty.

[7] This is a calculation of the ratio of the enterprise value (EV) of a company to its regulatory capital value (RCV)

30. Our plan is affordable with the affordability score actually increasing since October but if Ofwat is concerned about the presentational picture on bills then it could introduce a targeted reopener for these costs in-period when they arise. We further note that a reopener is likely to be needed anyway to capture the additional investments needed based on the new compliance standards established through Ofwat's enforcement notice.

31. In section 1, we discuss these issues further.

1.4.4. Supporting a healthy asset base

32. Ofwat should look again at our **asset health** investment case and should include funding for the civil structure investments that we proposed in our business plan.

33. We welcome Ofwat's inclusion of additional funding for targeted mains renewal investments. It is a significant step forward for Ofwat to recognise that the base funding allowances provided by its models are not sufficient to provide a sustainable level of long-term mains renewal, and to provide some additional funding to support this.

34. However, Ofwat's approach to asset health at DD is based on limited information on water mains and bioresources (around a third of the asset base across the sector). So, it provides allowances by looking only at activities around mains renewal – which is not consistent with its broader totex and outcomes-based approach. The DD calculates allowances based on the "implicit allowance" for this activity and historical replacement rates for water mains across companies. This means that where companies have invested less in mains renewal in the past (because more funding was reasonably required in other parts of the asset base), Ofwat may inaccurately label these necessary past investments as inefficiencies.

35. We propose an alternative approach for Ofwat to consider based on independent work undertaken by Reckon LLP[8]. Under this approach, Ofwat would allow additional funding only on a 'use it or lose it' basis but would allow this funding to be allocated to alternative parts of the asset base, if they can demonstrate to Ofwat that this is the right investment to choose, that their asset management is sound (using Ofwat's AMMA framework) and only if they have already spent all of their capital maintenance allowances in the past. We are working across the sector to develop alternative approaches to cost assessment, with significant interest and support from both Ofwat and Defra, that would address this underlying gap for PR29[9]. Our proposed approach could serve as a foundation for future price reviews and could, for example, be accompanied by additional remedies to increase information revelation across the period – supporting better outcomes at PR29.

[8] Published by Water UK, but we also include the final report as NES80F
[9] Published by Water UK, Infrastructure health in the water sector | Water UK

36. We are disappointed by Ofwat's exclusion of our investment proposals for civil structures. We provided that information in June 2023, but did not receive feedback or a single query on this enhancement case for more than a year. Our evidence is strong in this area, and we disagree with Ofwat's assessment of our case.

37. We have made some minor amendments to our case, and we have added new information in relation to our service reservoirs (in the water case) and new civil structure surveys (in the wastewater case). We urge Ofwat to reconsider this case on its own merits, rather than in the context of the overall challenge it is applying to company plans, or the overall level of bills customers are facing. Our customers support the continued inclusion of this investment.

38. We provide further evidence in support of our response in this area in section 5.

1.4.5. Climate change adaptation

39. Ofwat should reassess our **climate change adaptation** cases – and either provide funding so that we can invest to adapt to climate change; or introduce exclusions in performance commitments for extreme weather events that will become more and more frequent.

40. We do not support the approach taken in the DD of setting a sector-wide allowance. This funds companies according to the size and number of requests for climate resilience funding that Ofwat receive, rather than the evidence about the risks that individual companies face. In particular, we have shown that we face a bigger risk from power resilience in the event of wind storms than other companies do.

41. We provide some additional information to strengthen our cases in the area of climate resilience in response to the feedback in the DD, some of which was a fair challenge.

42. If Ofwat does not allow the funding for climate change adaptation, we propose that they should update the Performance Commitment definitions to allow for sensible exclusions for severe weather events. We have previously provided strong evidence to Ofwat that the reallocation of this risk to customers may well be in their best interests, as it would discourage over-investment to protect against extreme weather risks. This is the standard practice among other regulators with comparable duties and responsibilities – including Ofgem, who allow severe weather exclusions for DNOs. This means that we face the risks from cascading failures from power interruptions in extreme weather, rather than energy companies.

43. We provide further evidence on this in section 1.

1.5. FURTHER EVIDENCE FOR OFWAT TO CONSIDER IN RESPONSE TO THE DD

44. Ofwat's DD also challenged us to provide more evidence that our costs are efficient in some other areas, either through deep dives or models that compare costs across the sector. In some cases, we have provided more

evidence to support our original decisions. In other cases, we have considered Ofwat's concerns and carried out further work since our Business Plan to examine whether we could be more efficient or improve our decisions.

45. We set out our response to Ofwat's DD for each specific area in section 7 (for base and enhancement costs) and section 8 (for more detail on specific performance commitments). We also respond to some other issues in section 9.

46. For most deep dives, we also provide separate appendices which provide more detailed evidence in response to specific enhancement assessments. We refer to these in the sections below and in our response proforma (sheet RP2).

1.6. UPDATES TO OUR BUSINESS PLAN

47. We raised some **areas of uncertainty** in our Business Plan in October 2023, where statutory requirements through WINEP and WRMP had not yet been finalised. We provided an estimate of costs for possible alternative programmes. We updated Ofwat on this in January 2024 (where we also confirmed the outcome of new guidance for the septic tanks programme) and then again in May[10] and June 2024.

48. These have now all been resolved. In section 10, we explain this and set out proposed changes to our monitoring and nitrogen removal programme. We also plan to bring some further investment forward from future periods, including £130m of additional storm overflows investment and additional asset health investments in service reservoirs and wastewater treatment works.

49. Our customers preferred to go further on storm overflows, if possible, but were constrained by overall affordability. The Water Forum challenged us to do more without increasing bills. In this response, we propose additional investments that mean we would be going significantly further than the statutory requirements under SODRP before 2030. This would increase the number of storm overflows improved by 2030 from 159 (15.6% of all overflows that need to be improved) to 239 (23.4% of all overflows that need to be improved).

50. In addition to this, we have accepted Ofwat's 5% challenge to improve performance on storm overflows from base allowances – and increased this. This means setting a **sector leading target** to achieve 14 spills per overflow on average by 2030.

51. We have added eleven new storm overflows that are now included in WINEP, as recent SOAF investigations show that these could be cost beneficial to tackle. We have also selected some additional schemes that are efficient to deliver in 2025-30, either because we are already making other storm overflow improvements in those

[10] Letter from Andrew Beaver to James Veaney, 24 May

areas; or where they can be combined with existing phosphorus or nitrogen initiatives to enhance overall river quality. We describe our additional investment in storm overflows in more detail in section 11.

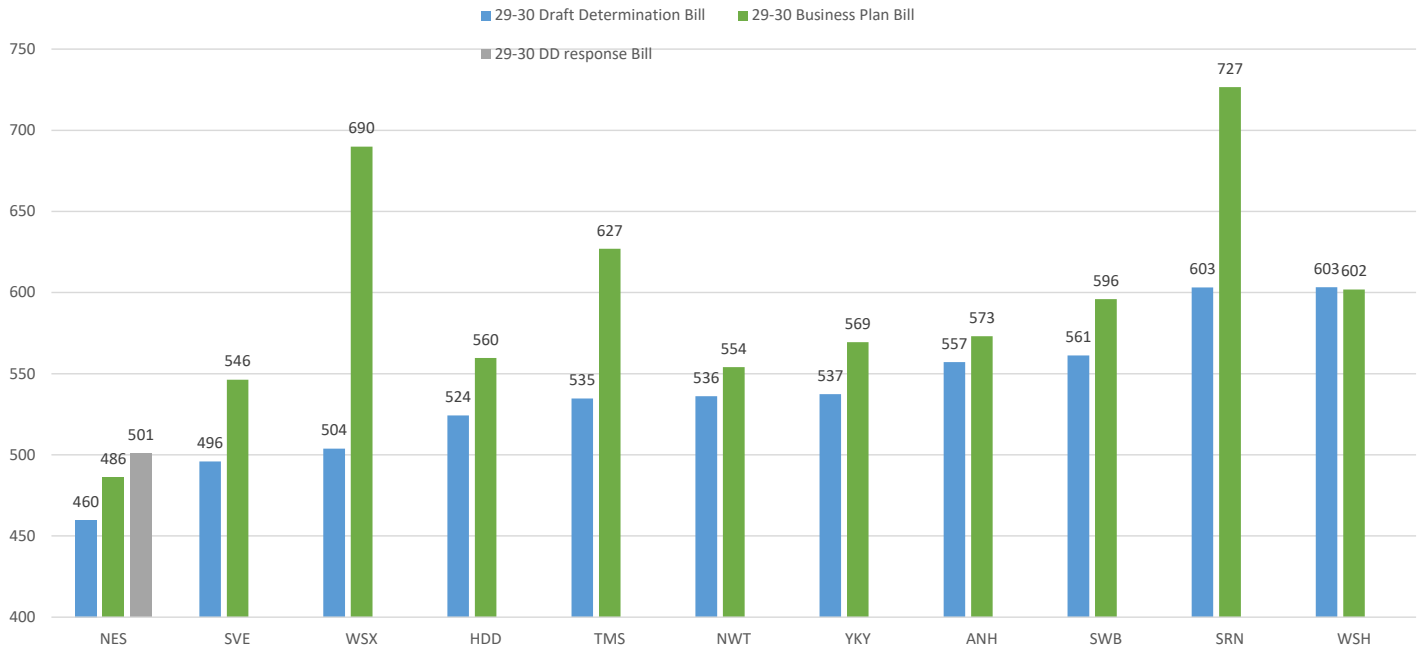
52. In our Business Plan, we delayed investments in replacing service reservoirs until 2030 – when we would start a ten-year replacement programme for our oldest, masonry service reservoirs. These are increasingly difficult to maintain and are at the end of their useful life, with regular investments to refresh these. Our customers supported replacing these where there would be an immediate service impact; and this would reduce the risk of water supply interruptions and water quality issues. We delayed this until 2030 because we did not think the regulatory framework at PR24 would support this investment – but increased risk scores from DWI for "lined" reservoirs and more analysis of our historic increasing costs to maintain service reservoirs have shown that it would be beneficial to accelerate the start of this programme into AMP8. We explain these additional investments in section 11 (and in our separate additional enhancement case).

53. Overall, our response to the DD would see bills increase by around 18.5% for customers, compared to around 16.5% in our original business plan[11]. This is driven partly by the investment changes set out above, most of which are entirely independent from the DD process and partly by changes in interest rates and market data influencing our view of the appropriate allowed return.

54. Below we compare the bill increases for the 2029-30 year at the end of the next price control period including our original business plan figure, Ofwat's DD and our DD response to the original business plans and DD's for other companies[12]. This shows that our combined overall bills and increases are still very likely to be the lowest amongst all the Water and Sewerage Companies.

[11] Including our 'alternative return' proposal
[12] We cannot yet see other companies' equivalent responses to the Ofwat Draft Determinations

FIGURE 1: PROJECTED 2029/30 HOUSEHOLD BILLS (COMPANY BUSINESS PLANS AND OFWAT'S DD) COMPARED TO OUR DD RESPONSE (EXCLUDING INFLATION)



Notes: Northumbrian Water ('NES') figures are shown for the original Business plan submission (in green using our 'alternative return') compared to the Ofwat DD (in blue) and our DD response (in grey). These figures are compared to other Water and Sewerage Companies business plan and DD responses.
Source: NWL analysis of company business plans and Ofwat's DD

55. Our customers prefer to invest in water and wastewater rather than reduce bills, and our Long-term Strategy shows that we expect investment to remain high beyond 2030. We asked our customers how they would like us to respond to the DD on asset health and climate change adaptation, as well as their views on these additional investments. We attach the full research report (NES82) and explain the findings in each section.

56. We also repeated some of the affordability and acceptability testing[13], to compare how customers feel now compared to in summer 2023. Customers are more likely to say that they could afford their water bills now than in 2023 despite the small increase since the original business plan – but acceptability has dropped a little, and 18% of our customers say that our plan is not acceptable, often linking this to trust in water companies and profits. However, 66% of our customers say the plan is acceptable, saying that they still support what we are trying to do in the long-term; and that our plans still focus on the right services.

57. Customers also said that they preferred an increase in bills starting sooner, spreading increases across different generations of bill payers (37%, see NES83). We asked customers if they supported increased investment above

[13] NES83

our business plan, and customers said that they would prefer to do this than see reduced bills (an acceptability score of 8 out of 10, see section 11.1).

58. It is not sensible or in the interests of customers to push investment in resilience back beyond 2030. Ofwat should consider including these additional investments in FD, rather than prioritising reductions in bills.

1.7. OFWAT'S DRAFT ENFORCEMENT NOTICE

59. We are considering Ofwat's draft enforcement notice[14] and will respond to that consultation in September. However, we consider that the standards of compliance under that notice are different from those applied by the Environment Agency, Secretary of State or Ofwat in the past. They are therefore not standards and capacities that we or the rest of the sector have been funded to deliver and maintain our wastewater network to. We are undertaking further work and the notice is relatively opaque but our initial view is that the incremental cost of meeting these new standards could be around £900m.

60. Setting aside the obvious point that we could not deliver an additional £900m of investment activity in the 2025-30 period, given the already huge capital programme that we have underway, we clearly need urgent clarity around these standards including with Government and the Environment Agency. Ofwat appears to have already formed a position on funding works, but has only communicated this through its press release relating to the draft enforcement notice (**Thames, Yorkshire and Northumbrian Water face £168 million penalty following sewage investigation - Ofwat**), in which it said: "*Ofwat will ensure that customers are not charged twice where additional maintenance is required*." No further clarification has been provided of this through the Draft Determinations or separately. It is essential that Ofwat explains its position further at this point and gives an opportunity to provide further comment: given the potential materiality it cannot wait until Final Determinations.

61. Furthermore, to address any material cost gap that arises from the investigation as a result of the introduction of new standards we believe that the storm overflows uncertainty mechanism needs to be expanded to allow these costs to be included.

62. We make some comments on the storm overflow uncertainty mechanism in section 11.1.2.

[14] See: **https://www.ofwat.gov.uk/consultation/notice-of-ofwats-proposal-to-issue-an-enforcement-order-and-impose-a-financial-penalty-on-northumbrian-water/**

2. BALANCING THE RISK IN THE PACKAGE

2.1. SUMMARY

63. Ofwat needs to set a balanced package – that is, one where investors in an efficient company can, on average, expect to achieve the allowed return on equity. This is necessary for Ofwat to comply with its legal duties and so that the package represents a fair investment for equity investors. This is particularly important at a time when substantial new equity capital needs to be raised – because if the package does not represent a fair investment, investors should and will deploy capital elsewhere.

64. In the DD, Ofwat says that it has set a balanced package with a symmetrical distribution around the allowed return. Ofwat has not published a transparent model behind its conclusion in the DD, and we requested this soon after the DD was published[15].

65. Nevertheless, our analysis of the balance of the package at DD shows that Ofwat's conclusion that the package is symmetrical is incorrect. Our analysis demonstrates that the P50 for Northumbrian Water on ODIs alone sits at -0.97%. Our empirical findings of a negative skew are also consistent with the design of Ofwat's package, in particular the existence of several PCs and associated ODIs which are "penalty only". Moreover, importantly, because the DD has significantly increased the scale of the incentives it increases the level of downside skew in NWLs original business plan on the incentive package.

66. Combining the expected loss on ODIs with our analysis of unfunded costs results in a combined P50 of 1.2% less than the allowed return on equity. In theory, this could be addressed by providing a commensurate upside allowance such as by aiming-up on the allowed CoE. However, it does not seem feasible or in line with regulatory best practice to include such a large negative skew and we agree with Ofwat that, generally speaking, asymmetry is best addressed at source, rather than in the allowed return.

67. Instead, we propose that Ofwat should make a small set of targeted amendments across the whole package to bring it more into balance.

68. If the following targeted amendments are made, this expected loss is reduced to -17bp:

- Adjust chemicals for RPEs and fund the business rates increase on a central forecast (as in our business plan).
- Restore a number of deadbands for asymmetric performance commitments – in particular, discharge compliance and serious pollutions.

[15] Throughout the (brief) seven week consultation period Ofwat was constantly updating its modelling suite, on several occasions models arrived with labels that sounded promising but ultimately nothing ever arrived that demonstrated clearly how they had arrived at their cost risk positions as per the published documents.

- Reconsider the introduction of asymmetric downside skew for C-MEX or looking at ways to mitigate this while incentivising improving customer service, which means significant changes to Ofwat's CMeX proposals which are clearly asymmetric.
- Reconsider the level of baseline performance against several measures in the package, including PCC, interruptions to supply, and pollutions. Targets should start from actual performance data consistent with the approach to setting cost allowances.
- Include growth assumptions in the non-household demand performance commitment.
- Reduce frontier shift from 1% to 0.8%.

69. Ofwat may wish to go further than this to reduce asymmetric skew. The above analysis is for Northumbrian Water alone, which is a relatively good performer - so even these changes are unlikely to be sufficient for a sensible 'notional' company benchmark. However, even with these changes there would still be residual asymmetry of 17bp[16]. This could then be addressed by aiming-up on the allowed CoE, consistent with the CMA's approach at PR19. We explain this further in section 3.

70. The problem of asymmetry in the package is potentially very serious. In their report from August 2024, Moody's finds that if companies perform in line with their business plan assumptions, then only one company (out of 18) could achieve an uplift in equity returns from operational outperformance and the average outturn return on equity would be around 3 percentage points below the allowed return.[17] Similarly, in a separate report, First Economics also highlights the clear imbalance in the ODI package specifically[18].

> "As a consequence, we are not seeing how Ofwat could have satisfied itself that it has devised a package that 3/4/5/6 companies, including good representation from the water and sewerage companies, are going to look at and think "yes, Ofwat is right, this gives us an opportunity to earn a net ODI reward on the back of high levels of service to customers". We instead see a regulatory framework that says that only a few of the very strongest performers can expect, at best, to just about break even, while anyone that sits further down the industry league table is likely to suffer a loss." First Economics

71. The analysis from the Moody's report (for Northumbrian Water) is broadly consistent with our own Monte-Carlo analysis of ODI outturn performance. Across companies, though, it is likely to be an understatement of the downside risk because the analysis assumes as its starting point that companies will hit their PC targets as per their business plans. However, in practice Ofwat's historical policy and approach as well as its stated position in the methodology and through its Quality and Ambition Assessment has encouraged companies to set ambitious, stretching targets for service improvement. So, we know that the targets in companies' plans are already likely to

[16] Note – this is net of a 14bps uplift for NWL top 4 company performance, which would be removed for the industry average, increasing the asymmetry to 31bps.
[17] August Moody's Report, page 8.
[18] NES93, First Economics, 2024, PR24: Performance Commitments and ODIs

be difficult for some companies to hit. Regardless of this underestimate, under the DD there would be a substantial expected loss across the sector (as assessed by an independent third party and corroborated by our own analysis).

2.2. OFWAT'S LEGAL DUTIES REQUIRE IT TO SET A BALANCED PACKAGE

72. Under its statutory duties, Ofwat needs to set a determination that allows water companies to finance their functions, particularly by securing reasonable returns on capital[19]. That is, a determination that is stretching but where an efficient company can earn its base allowed return on equity on a mean expected basis.

73. If the determination is too stretching, then an efficient company cannot expect to earn its base allowed return on equity and, over time, the sector may be unable to attract the finance it needs. If the determination is not stretching enough, then some companies may earn windfall gains. Overall, Ofwat needs to set a balanced package that allows the 'notional company' to earn its base allowed return on equity at the median probability level (or the P50). If it cannot, then the package is not financeable and Ofwat is not meeting its statutory duties.

74. In its final report on the PR19 water redeterminations[20] the CMA stated:

> "In setting the allowed return, our duty is to consider whether investors in a notional company, acting efficiently, have a reasonable expectation of a return equal to its WACC. Our assessment is that those investors would also take into account structural asymmetry in the package of incentives when considering expected returns on investment.
>
> Overall, we conclude that expected returns on ODIs should reflect the balance of rewards and penalties. Accordingly, we would expect negative ODI-related returns on average. Therefore, for the expected return to be consistent with the cost of capital, we would expect a small premium to be required."

75. We further note that this position is also now crystallised in the actual dividends that investors receive each year, because in 2023 Ofwat introduced a new licence modification that limits dividend payments, specifically the new licence condition states:

> "The Appointee shall declare or pay dividends only in accordance with a dividend policy which has been approved by the Board of the Appointee and which complies with the following principles:
>
> i. that dividends declared or paid will not impair the ability of the Appointee to finance the Appointed Business, taking account of current and future investment needs and financial resilience over the longer term;

[19] Water Industry Act 1991, S2
[20] CMA 2021 Redeterminations, p1082 para 9

ii. that dividends declared or paid take account of service delivery for customers and the environment over time, including performance levels, and other obligations; and

iii. that dividends declared or paid reward efficiency and the effective management of risks to the Appointed Business.

For the purpose of this licence condition, dividends refers to any distributions declared or paid in respect of any ordinary shares or preference shares."[21]

76. The associated guidance supporting this condition[22] effectively stops companies paying any distributions that do not reflect cost, service, and financing performance of the business. This more recent change effectively stops companies from being able to pay the base allowed return or 'WACC' even if the company could do so – or the company could face an investigation and potential licence breach, which Ofwat has shown it is willing to undertake[23].

77. Ofwat should aim to establish a balanced package, or if that balance cannot be achieved, ensure that the allowed return adequately compensates investors for any asymmetrical downside risk within the package.

2.3. OFWAT'S ANALYSIS OF RISK IN THE DD PACKAGE

78. In its DD, Ofwat presents the results of its own risk analysis which focuses on three key areas:

- Operational risks related to costs – assessing whether the notional company is likely, on a mean expected basis, to over or underspend against its allowed costs.
- Operational risks related to performance incentives – assessing whether the notional company is likely, on the same mean expected basis, to be able to hit its performance targets or receive either service performance penalties or rewards.
- Financing risks – assessing whether the notional company is likely to be able to live within its financing allowances without experiencing any out or underperformance on a mean expected basis.

79. In the DD, Ofwat presents the package as 'in balance', with no expected out or underperformance for the notional company. Ofwat says that this is because although there is an imbalance in the form of a 20bp expected loss in its 'operational' risk areas (which we assume is driven by an imbalance in costs as it suggests its performance incentive regime is in balance, but this is not clear in the DD), this is offset by an equivalent 20bp upside on financing risk. Ofwat's findings are summarised in Figure 2 below.

[21] Ofwat published its decision document on the licence modification here
[22] Ofwat's published dividend policy guidance can be found here
[23] See for example recent press articles in relation to an investigation into dividends from Thames Water here

FIGURE 2: OFWAT DD RISK RANGE

	Ofwat DD range		
Risk area	**P10**	**P50**	**P90**
Operational risk (cost and incentives)	-4.0%	-0.2%	3.6%
Financing risk	-0.5%	0.2%	0.9%
Overall risk	-4.5%	0.0%	4.5%

Source: Ofwat's DD Appendix: 'Aligning risk and return appendix', p.21

80. We were surprised by Ofwat's analysis, which does not reflect the experience in the current period and the inherent design of the ODI package. Between 2020-24, no company in the sector is delivering against Ofwat's cost allowances and meeting the Performance Commitments in its PR19 settlement[24]. All companies are experiencing some degree of overspending on costs and/or incentive penalties.

81. There are several fundamental errors in Ofwat's risk analysis. We highlight some of the key problems below and then provide further detail in subsequent sections.

82. There is **no overarching analysis, modelling, or assessment** that brings the risk analysis together in a comprehensive way for the DD. The analysis seems to have been done separately for finance, outcomes, and costs but how the results of each of these areas should be aggregated to get an overall position is not clear.

83. Ofwat published detailed modelling of its PC/ODI risk analysis with the DD but provided no modelling for costs or finance risk (the other two key elements). We raised a query on 22 July, but this information was not provided either in the response nor on the website update[25]. The nature of Ofwat's response suggests that it did not have this information immediately available, despite relying on this evidence in the DD.

84. At the same time, the DD includes a wide range of additional and complex regulatory mechanisms to manage risk. We welcome many of these as sensible additions to the regulatory framework, and we acknowledge that many of these mechanisms are logically sound on their own, it is clear that the collective impact of these mechanisms together has not been assessed in the DD.

85. On **costs**, Ofwat has made several adjustments that turn a net overspend of nearly £2bn for the sector into a small underspend (it is not clear how these adjustments have been made). This is not sensible and drives an incorrect view that cost risk is symmetrical even after the adjustments Ofwat has made to the risk package.

[24] See for example our BP submission pp.24-25 including Figure 12. We note that this trend has continued into the most recent 23/24 financial year with industry overspending growing to 13% from c.7% across the 2020-23 period.
[25] https://www.ofwat.gov.uk/wp-content/uploads/2024/08/Totex-RORE-calcs-for-given-cost-variance-for-publication.xlsx was uploaded by Ofwat, but has hard keyed +/- 8.5% variances, not the calculations to generate them.

86. We have been unable to verify any of Ofwat's calculations in this area, and so we cannot assess whether or not it is reasonable. Our own analysis of costs presents a different view, showing a 28bp downward skew for us – this could be much more significant for the notional company, given our relative cost performance.

87. Ofwat appears to make an unrealistic assumption that companies will meet the **performance commitments** it sets in the DD at the P50 – without considering any analysis of whether or not this is achievable. Ofwat's position on performance incentive risk also has some limitations, as it starts from the PCLs set at DD. This means that it assumes that improvements from the current position of even the best companies in the sector now could be met by the notional company at P50. This assumption drives the results that Ofwat uses.

88. We examine the adjustments that Ofwat has made to its approach to setting both cost allowances and performance incentives to understand how they have arrived at this position, given the AMP7 experience and we comment on each element of the risk analysis below.

2.4. LEVELS OF OPERATIONAL COST RISK IN THE DD

89. Our Business Plan set out the efficient costs that we considered were required to deliver our legal obligations and the service levels that we committed to in that plan. We used Ofwat's cost models to set out base cost allowances and applied reasonable efficiency assumptions including targeting the 'catch-up' challenge on the 'upper quartile' efficient company and a 0.8% per annum frontier shift assumption[26]. This efficiency assumption was both at the very top of the range of the independent expert report provided by Economic Insight and also the most aggressive assumption applied by any WaSC to their business plans (where both we and Anglian Water applied a 0.8% assumption). For our enhancement costs we developed cost estimates up to a standard where our internal data suggested that we would expect a symmetrical +/- 50% cost variance at the outturn. We considered the recent historical industry performance on costs in developing the plan and sought a range of additional risk protections including, for example, true-ups for a range of Real-Price Effects (RPEs) including power, labour, chemicals and plant and materials (based on our experience of significant input cost inflation in AMP7) and a re-opener for storm overflow costs.

90. Ofwat's analysis of cost risk was opaque, as Ofwat did not publish this data in a model so we could track their calculations. We raised a query which Ofwat responded to saying the model would be published but fundamentally we couldn't see anywhere that this had actually happened and certainly not in a sensible timeframe in which we could review it and respond. We had concerns with several of Ofwat's assumptions in the DD, such as its reliance on 2015-20 data and the adjustments that they applied to the 2020-23 data, in particular including the apparent exclusion of Southern Water's turnaround costs.

[26] See our Business Plan Costs Annex, A3, section 3.

91. We have therefore undertaken our own analysis of cost risk for Northumbrian Water specifically. This analysis shows that at the P50 we estimate that there is an expected loss on costs of around -29bp of RoRE. This leaves a degree of downside asymmetry that Ofwat will need to address at the FD. We proposed an adjustment for RPE on chemicals and a reduction in frontier shift from 1% to 0.8% to address this asymmetry, which results in a more modest expected loss on costs. We describe this below.

2.4.1. Understanding the overall balance of cost risk

92. In the DD, Ofwat makes certain methodological choices about how it sets the efficient cost allowances for both base and enhancement costs and introduces several extra risk protection mechanisms. We summarise the key elements of these in the table below which also includes comparisons with the current regulatory period (AMP7). This is relevant when we consider whether the current period will provide a good guide to AMP8. We also compare this to our Business Plan, to help understand how the relative risks compare.

FIGURE 3: COMPARISON BETWEEN OFWAT DD COST RISK PROTECTIONS, AMP7 AND OUR BUSINESS PLAN

Risk protection	Is the DD consistent with AMP7?	Is the DD the same as our business plan?	Commentary
Base costs - catch-up efficiency	No	Yes	Ofwat applied a more stretching **catch-up challenge at PR19 than it now applies at PR24 (using 3rd company for wastewater, 4th for water). For NWL the CMA in its redetermination did apply an upper quartile challenge.** Both our Business Plan and the Ofwat DD choose an 'upper quartile' benchmark company to select the 'catch-up' efficiency challenge.
Frontier shift efficiency	No	No	Ofwat **applied a 1.1% frontier shift in AMP7 but the CMA adjusted this to 1% for appealing companies.** Our Business Plan used a 0.8% pa efficiency assumption. Ofwat's DD applies a stronger 1% pa challenge.
Inflation	No	Yes	Ofwat's **wholesale price controls are all indexed to CPIH and this is the same for AMP 7 and 8 and consistent with the CMA PR19 decisions.** Ofwat's AMP 7 allowances for retail (costs and revenues) excluded a direct inflationary link and no allowance was provided for retail cost inflation. In the DD, Ofwat provides such an allowance which is broadly equivalent to our plan.
RPEs	No	No	Ofwa**t and the CMA both included RPEs for labour only in AMP7.** Our Business Plan included Real Price Effect allowances for labour **with a true-up for all cost categories (labour, power, chemicals, and plant and materials).** Ofwat's DD includes similar RPEs for labour and power but excludes RPEs for chemicals, plant, and materials.

Risk protection	Is the DD consistent with AMP7?	Is the DD the same as our business plan?	Commentary
			They also include a true-up for labour, power, and plant and materials.
Cost sharing	No	No / Yes	Ofwat applied **differential cost sharing rates across companies in AMP7. The CMA applied a 45:55 sharing factor.** Both the DD and our Business Plan uses 50:50 cost sharing on **modelled base costs.** On unmodelled base costs our Business Plan suggested a pass-through on Kielder abstraction costs whilst the DD includes a 72:25 cost sharing rate. On business rates, both the DD and our business plan used a 90:10 cost sharing rate. We proposed 50:50 sharing in our Business Plan for enhancement expenditure. Ofwat's DD applies different cost sharing rates (40:40) for enhancement expenditure generally. But even lower cost sharing rates (25:25) for enhancement expenditure areas with higher uncertainty.
Enhancement cost efficiency benchmarking	No	No	Ofwat's general approach to efficiency benchmarking is similar to AMP 7 but models are different and Ofwat now applies the modelled allo**wance (rather than the lower of modelled or actual and caps allowances at a higher level).** Our Business Plan used a range of independent **third party benchmarking evidence to challenge our costs.** Ofwat uses comparative benchmarking of unit or econometric cost models using data from company business plans in the DD.
Uncertainty mechanisms/reopeners	No	Yes	There are no significant uncertainty mechanisms in AMP7. In our plan we included a reopener mechanism for Storm Overflow costs and Ofwat has included a different mechanism in the DD which seeks to provide similar risk mitigations.
Price Control Deliverables (PCDs)	No	No	Companies are subject to ODIs in the current period which seek to provide some of the same protect**ions as PCDs in AMP8. But the proposed PCDs are more onerous and provide additional financial incentives linked to timescales of delivery.** Our Business Plan included PCDs for large schemes, but Ofwat has set these centrally in the DD.
Other risk mechanisms	No	No	Ofwat includes two new risk mitigants in the DD that were not present in either our plan or the AMP 7 period. A delayed delivery mechanism incentive **- which provides additional financial penalties if a company falls significantly behind on its investment programme.**

Risk protection	Is the DD consistent with AMP7?	Is the DD the same as our business plan?	Commentary
			An Aggregate Sharing Mechanism (ASM) for wholesale total expenditure, with 50% sharing beyond ±2% RoRE measured against five years of the period.

Source: Ofwat DD

93. From the above comparisons we can draw the following conclusions.

94. **Base cost risks have reduced compared to AMP7** for all companies (including those who appealed to the CMA at PR19 and others). This is driven by:

- Slightly lower catch-up and frontier shift efficiency assumptions for non-CMA appellants compared to AMP7.
- Allowances for retail cost inflation.
- Allowances for power as well as labour RPEs with end of period true-up mechanisms for all companies compared to AMP7 (and CMA decisions).
- Improved cost sharing rates.

95. **Base cost risks have increased relative to our Business Plan**. This is driven by:

- Slightly higher frontier shift efficiency assumptions.
- Exclusion of RPEs for chemicals, plant and materials costs or associated true-up mechanisms.

96. **Enhancement cost risks have reduced relative to AMP7** for all companies (including CMA appellants and others). This is driven by:

- Slightly more generous enhancement cost benchmarking mechanisms potentially with slightly lower frontier shift assumptions for non-CMA appellants compared to AMP7.
- Allowances for plant and materials as well as labour with associated true-ups compared to AMP7.
- Improved cost sharing rates and reopeners for storm overflow costs.
- This may be offset to some extent by the introduction of more stringent PCDs.

97. **Enhancement cost risks relative to our Business Plan are more difficult to understand** as there are differential effects.

- Cost benchmarking is potentially more generous, but efficiency assumptions would be consistent with the CMA.
- RPEs and true-ups are also less than our Business Plan proposed.
- However, cost sharing rates have improved, and reopeners are broadly consistent with our plan.
- We expect PCDs to increase risk.

2.4.2. Ofwat's analysis of cost risk disregards relevant data

98. As part of its overall analysis of RoRE risk, Ofwat undertakes an assessment of the risk faced by an efficient company on totex (including both wholesale and retail costs),[27] after applying the new mechanisms outlined in section 2.3 above.

99. To calculate the risk range on wholesale costs, Ofwat uses the P10 and P90 from the 2015-2020 period, because it considers that this is the closest comparator to the PR24 approach.[28] Ofwat disregards the evidence from 2020-2023 on the basis that:

- This period is distorted by the Covid-19 pandemic and a subsequent period of high inflation;[29]
- Companies have been delivering performance turnaround programmes which increases costs; [30]
- Southern Water's overspend, reflecting its need to deliver a performance turnaround is a material driver of sector wide overspend in this period; [31]
- Energy and leakage costs are a material driver of the overspend but this won't be repeated in PR24 due to the energy indexation mechanism and the revised approach to remunerating efficient leakage costs;[32] and
- The PR24 base allowances are 14% higher than PR19 suggesting that underperformance at PR19 is unlikely to be representative of PR24.[33]

100. Ofwat therefore adopts the 2015-2020 RoRE risk range of +/-8.5% for wholesale totex over/underspend.[34]

101. Consistent with its approach to wholesale costs, Ofwat uses the 2015-20 period in order to estimate the RoRE risk arising from retail costs, which it finds to be +/-0.30%.[35]

102. We disagree with Ofwat's approach of disregarding all the performance data from PR19. Although Ofwat has introduced a number of risk mitigants at PR24, and there may be AMP-specific factors partially driving results, Ofwat's approach is not credible. This is because it assumes that performance data from AMP8 provides no additional value beyond that from 2015 to 2020. In particular:

- Ofwat rejects PR19 data because some companies are undertaking turnaround programmes. However, these programmes are exactly the sort of activities that are expected to drive an overspend compared to base allowances, and so they should be captured in cost risk analysis. Disregarding this data excludes an important part of how companies respond to regulatory incentives and performance targets over time, and it is

[27] Ofwat DD, Aligning Risk and Return Appendix, page 6
[28] Ofwat DD, Aligning Risk and Return Appendix, page 7 and 9
[29] Ofwat DD, Aligning Risk and Return Appendix, page 8
[30] Ofwat DD, Aligning Risk and Return Appendix, page 8
[31] Ofwat DD, Aligning Risk and Return Appendix, page 9
[32] Ofwat DD, Aligning Risk and Return Appendix, page 9
[33] Ofwat DD, Aligning Risk and Return Appendix, page 9
[34] Ofwat DD, Aligning Risk and Return Appendix, page 9
[35] Ofwat DD, Aligning Risk and Return Appendix, page 13

likely that similar programmes will be needed in future. In particular, Ofwat should not exclude Southern Water's turnaround plan because this distorts the dataset by removing an inconveniently high value.

- Ofwat should instead make targeted adjustments to the risk analysis to remove the elements of PR19 overspend that are not expected to be repeated – for example, due to the distortive effects of Covid-19 and lack of energy indexation – rather than disregarding PR19 performance data entirely.

103. Finally, as we highlight in section 2.4, Ofwat's analysis of cost risk is opaque. This may be because Ofwat has simply assumed the same cost risk as 2015-2020. However, Ofwat's reliance on 2015-2020 hinges on its finding that once turnaround plans (in particular Southern Water's turnaround programme) are removed, then the bulk of remaining underperformance in PR19 is due to energy and leakage.[36] Setting aside our concern with removing the turnaround programmes, we have not been able to test the validity of Ofwat's findings around PR19 cost risk due to this lack of transparency, and cannot verify Ofwat's position that PR24 is likely to be sufficiently similar to 2015-2020 to simply assume the same level of cost risk.

2.4.3. Developing our own view of cost risk

104. The most relevant price review period on which to base cost information for forecasting PR24 cost risk is the PR19 period. These years represent the most recent information on performance against the regulatory allowances.

105. Definitive results from Ofwat's RoRE risk analysis should be expressed on an industry-wide basis – but, as it is difficult to undertake this risk analysis at an industry level and reflect the detailed performance of each company, we have carried out a cost risk analysis based on our own performance in PR19. We consider that the distribution of outcomes from our Northumbrian Water-specific risk analysis is likely to be shifted upwards because we are a good performer on costs, as demonstrated in Figure 4 below (extracted from our business plan, NES01). Therefore, our P10, P50 and P90 results are likely to be overestimates of performance on an industry-wide basis.

[36] Ofwat DD, Aligning Risk and Return Appendix, page 9

FIGURE 4: OUR COST EFFICIENCY AND SERVICE PERFORMANCE PLACES US IN THE TOP 25% OF WATER AND SEWERAGE COMPANIES

Source: See Figure 7 of Northumbrian Water business plan

106. For our own cost risk analysis we used NWL's actual versus allowed expenditure for AMP7 (2020-24), the most recent period. We then made targeted adjustments to our outturn expenditure to mirror the impacts of Ofwat's DD mitigations including, for example:

- RPEs for energy; and
- Alternative cost sharing rates for both base and enhancement costs

107. The results of our analysis of ranges for the distribution of returns for Northumbrian Water for PR24 due to cost-based risk are shown in Figure 5 below, which are based on additive P10, P50 and P90 levels, and calculated as a percentage of regulatory equity. We present risk ranges that assume that no changes are made to the DD ('Pre-mitigations') and following two proposed targeted amendments, which are:

- The introduction of a RPE adjustment for chemicals (see section 7.1.8 for more details); and
- A reduction in Frontier shift from 1% to 0.8% (see section 7.1.7 for more details).

FIGURE 5: RISK RANGES FOR THE DISTRIBUTION OF RETURNS FOR NWL DUE TO COST-BASED RISK UNDER THE DD AND FOLLOWING PROPOSED MITIGATIONS

	Pre-mitigations			Post-mitigations		
Component	**P90**	**P10**	**P50**	**P90**	**P10**	**P50**
Wholesale totex	1.39%	-1.94%	-0.28%	1.35%	-1.59%	-0.12%
Retail totex	0.01%	-0.04%	-0.01%	0.01%	-0.04%	-0.01%
RoRE due to cost risks	**1.40%**	**-1.97%**	**-0.29%**	**1.36%**	**-1.62%**	**-0.13%**

Source: Northumbrian Water analysis

108. Our analysis suggests that before targeted amendments are made to Ofwat's DD, there is an expected loss to Northumbrian Water from the cost allowances at the P50 level of -29bp. This differs from Ofwat's finding of no loss at the P50 level because Ofwat has not trained its cost-based RoRE risk analysis on PR19, but instead has chosen to simply adopt the 2015-20 outturn cost ranges. As we have set out, this is incorrect.

109. As we are a good performer on costs (see Figure 4), it is likely that the P50 level on an industry-wide basis is at least as negative as -29bp.

110. Following the targeted amendments, the cost risk for Northumbrian Water is more modest at -13bp.

2.5. LEVELS OF OPERATIONAL PERFORMANCE INCENTIVE RISK IN THE DD

2.5.1. The incentive package has substantial downside skew if left unadjusted

111. This covers the incentive package of 'Outcome Delivery Incentives' (ODIs) and other incentives. Where our performance varies from the agreed targets, it will either drive upside rewards or downside financial penalties. For our Business Plan we built a model that used historical performance data at an industry level and operational expertise and judgement of our own performance to develop expected performance ranges for each service level across the period. We then used Monte Carlo analysis to develop probability distributions across the package for the AMP 8 period. From this Business Plan analysis it was clear that at the P50 level we would expect to have negative penalties of around -0.28% of Return on Regulated Equity (RoRE) across the period with an asymmetric downside skew in the package ranging from -0.86% (at the P10) to +0.21% (at the P90)[37]. To reflect this imbalance, we proposed that Ofwat should 'aim up' on the allowed equity return by a similar 25 bps (consistent with the PR19 CMA precedent[38]).

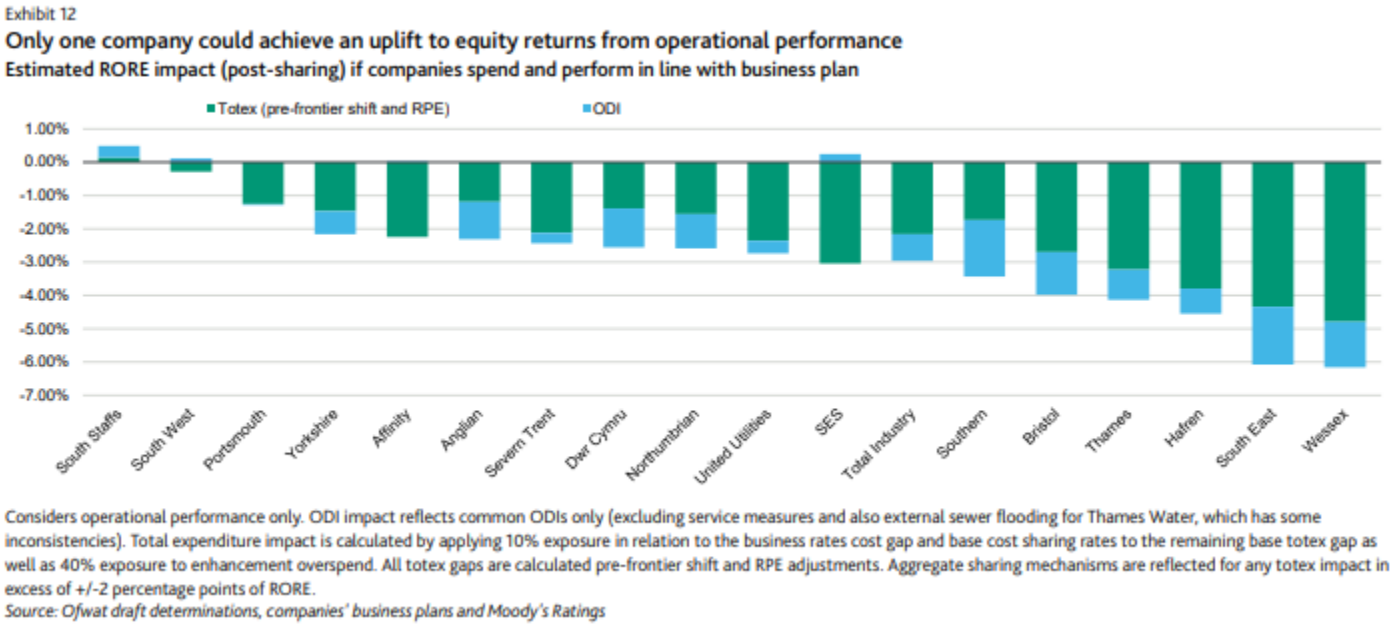
112. In the DD, Ofwat uses comparative assessments across companies and other methods to set the proposed Performance Commitment (PC) levels and makes a number of changes to the incentive regime, some of which

[37] See our PR24 Business Plan Outcomes appendix, A4, section 3.1.4 including Figure 31
[38] CMA, 2021, Final report, p.1098, paras 9.1402-9.1404

are designed to reduce the asymmetric risk. For example, the softening of some PCs (targeting 'median' rather than 'upper quartile' improvement). However, Ofwat also alters the incentive rates significantly, usually increasing them. Ofwat also provides its own ODI Monte Carlo analysis which it uses to suggest that the incentive package has now been brought into balance with a P10 of -2.3% and a P90 of 2.0% and an expected outturn at 0. A key element in this analysis is the assumption that at the P50 the notional company will hit the target – which is unlikely to happen in practice.

113. We note that several commentators have raised concerns with Ofwat's analysis including Moodys[39] and First Economics[40]. The chart below is taken from Moody's publication on the matter.

FIGURE 6: MOODY'S ANALYSIS OF OPERATIONAL RISK IN THE DD



Source: Moody's Regulated Water Utilities – UK: Ofwat's draft determination increases sector risk August 2024

114. Give the concerns with Ofwat's own analysis, we have re-run our own Monte Carlo analysis using the updated data from the DD, and this produces a wider range – showing a substantially more negative P50 at -0.97% of RoRE; and a P10 at -1.95% and P90 at 0.01% (reflecting larger incentives). This is set out in Figure 7 below. The results are consistent with a DD package for Northumbrian Water in which targets are comparatively close to those in our business plan (which Ofwat assessed as offering 'high' ambition on service performance in its QAA assessment) but with significantly more stretching incentive rates (increasing the expected loss from the one we included in our plan). This means that there is a significant downside skew and should be adjusted.

[39] Moody's ratings, August 2024, 'Regulated Water Utilities – UK, Ofwat's draft determination increases sector risk'
[40] NES93, First Economics, August 2024, PR24: Performance Commitments and ODIs

115. We note that the asymmetry we found in our own analysis is similar in scale to the values identified by Moody's in their own work.

2.5.2. Targeted adjustments to reduce the scale of asymmetry

116. In theory, the expected loss from the PC/ODI position in the DD could be addressed by providing a commensurate upside allowance. However, it does not seem feasible to "aim up" for 0.97% of RORE as this would be a very large change in the allowed cost of capital.

117. Instead, Ofwat should review the package of PCs and ODIs and make amendments to restore more balance to the incentive package. In section 8, we explain four targeted changes to the incentives package that Ofwat should make – which we estimate would reduce the expected loss at P50 to 8bp. In summary, these are:

- Restoring a number of deadbands for asymmetric performance commitments – that is, discharge compliance (see section 8.2.1), and serious pollutions (see section 8.2.2). This would help to reduce some of the downside risk of these performance commitments.
- Reconsidering the introduction of asymmetric downside skew for C-MEX or looking at ways to mitigate this while incentivising improving customer service (see section 8.3).
- Reconsidering the level of baseline performance against several measures in the package, including PCC, interruptions to supply, and pollutions. In each of these cases, Ofwat has made assumptions about the starting point for AMP8 based on historic targets and definitions rather than looking forward, and this means that these do not match the likely future risks and challenges. This includes the impact of extreme weather. We propose changes to these in section 8.4.
- Reconsidering the inclusion of growth assumptions in the non-household demand performance commitment or looking at ways to mitigate this downside risk that is beyond the control of water companies (see section 8.6).

118. Figure 7 shows the revised PC/ODI risk analysis after the above targeted adjustments are made.

FIGURE 7: RISK RANGES FOR THE DISTRIBUTION OF RETURNS FOR NWL DUE TO ODI RISK UNDER THE DD AND FOLLOWING PROPOSED MITIGATIONS

	Pre-mitigations			Post-mitigations		
Component	**P90**	**P10**	**P50**	**P90**	**P10**	**P50**
Outcome delivery incentives	0.01%	-1.95%	-0.97%	0.75%	-1.18%	-0.22%
Customer measures of experience	0.41%	-0.30%	0.06%	0.57%	-0.30%	0.14%
RoRE due to ODIs	**0.42%**	**-2.25%**	**-0.92%**	**1.32%**	**-1.48%**	**-0.08%**

Source: Northumbrian Water analysis

2.6. FINANCIAL RISK

119. Ofwat also examines the scope for financing outperformance alongside the operational aspects (costs and ODIs) of the DD, including:

- Inflation impacts that result from the allowed cost of debt being based on a long-term estimate of inflation while the RCV is indexed by outturn inflation.[41]
- Raising new debt, where companies can perform better or worse than the benchmark index, which can lead to expected out or underperformance.[42]
- Revenue recovery, where companies have modest risk exposure due to the revenue forecasting incentive mechanism.[43]

120. As a matter of principle, we do not consider that there should be an expected under/over performance on financing at the P50, as the allowed return should be set such that an efficient company with the notional financial structure can cover its cost of equity and debt finance.

121. Setting the above point of principle aside, we do not consider that Ofwat's assessment of financing outperformance is sound. This is primarily because past outperformance on inflation may not be repeated in future and outperformance on debt by the notional company at the P50 is both conceptually unsound and no longer evident in the data (where there is now material underperformance). We explain this below.

2.6.1. Financing performance should be zero at P50 by design

122. As a matter of principle, there should be no expected under/over performance on financing at the P50, as the allowed return should be set such that an efficient company with the notional financing structure can cover its cost of equity and debt finance. We have not therefore included financing over/underperformance in our RoRE risk analysis here.

123. However, if Ofwat continues to consider that there is merit in doing an assessment of expected out/under-performance on financing for its P50 RoRE estimate, then:

- All financing parameters should be considered, not just those that Ofwat considers may introduce expected outperformance. For example, as we explain in section 3, the long-run approach to setting key parameters in the cost of equity (such as the total market return) may lead to the allowed cost of equity being above the market cost of equity during periods of higher interest rates.

[41] Ofwat DD, Aligning Risk and Return Appendix, page 18
[42] Ofwat DD, Aligning Risk and Return Appendix, page 20
[43] Ofwat DD, Aligning Risk and Return Appendix, page 21

- The calculations of expected out/under performance on new debt vs the iBoxx and outturn inflation vs 2% should be updated, which we address in sections 2.6.2 and 2.6.3 below.

2.6.2. Outperformance due to actual issuances deviating from the iBoxx

124. Ofwat sets the cost of new debt with reference to the iBoxx A/BBB 10yr+. In the DD, it explains that on average companies may outperform this index on new debt, which could generate a degree of financing outperformance.

125. Firstly, as we explain above, as a matter of principle the notional financing assumptions in the cost of new debt allowance and the benchmark efficient company with the notional financial structure (that is, used for the RoRE risk modelling) should be one and the same thing. We would therefore expect the P50 to be zero by design.

126. Secondly, as explained in more detail in section 3.4, water companies are now issuing debt at a premium to the iBoxx A/BBB 10yr+, which Ofwat is using for the allowed cost of new debt. This includes companies with capital structures in line with Ofwat's notional gearing assumption. It follows, that unless Ofwat adjusts its approach to the cost of new debt to reflect the latest market data, then there is an expected **under**performance on debt for the notional company.

2.6.3. Outperformance on inflation is a historical trend that cannot be assumed to be repeatable

127. The remaining financial outperformance estimated by Ofwat assumes (broadly speaking) that because outturn CPIH has been higher than the long-term estimate of 2% in the past, then this will be the same in the future, providing companies with an expectation of outperformance on inflation.

128. We agree that historically inflation has tended to be above the 2% target, more so than it has been below and that this has given companies an opportunity to outperform. This is because:

- The cost of debt allowance is based on applying a real return to the RCV.
- The real return on debt is derived by stripping out long-term CPIH inflation from the observed nominal cost of debt.
- The inflation element of the allowed return is provided by indexing the RCV to outturn inflation.

129. It follows that where inflation is above 2%, the real allowed return on debt would still incorporate an element of inflation but the RCV would then also be indexed to outturn inflation, leading to overcompensation for the inflation element of returns. If outturn inflation is below 2%, we would expect to see the opposite effect.

130. While we agree that the mechanism described in paragraph 128 has resulted in outperformance historically, it does not necessarily follow that this should be treated as an expected outperformance going forwards because the mechanism creates upside as well as downside risk that sits with companies. It cannot be expected that simply because this risk has been to the upside in the past that this will be repeated in future. Indeed, recent BoE

forecasts suggest that CPI inflation will fall below 2% during AMP8[44]. In addition, as matter of principle it should not necessarily be considered 'outperformance' if companies on average achieve a benefit for holding risk. Rather, achieving ex post positive returns is simply the reward for holding inflation risk.

2.7. OUR CORRECTED POSITION ON RISK IN THE PACKAGE

131. We have shown in sections 2.3 to 2.6 above that Ofwat's conclusion that the package is symmetrical (with a zero P50) is not right. Our analysis – and the independent Moody's sector-wide analysis – show that this would result in a material expected loss. We note that this package cannot be symmetrical when there are penalty-only ODIs.

132. We recommended a series of mitigations on costs and ODIs in this response. These were:

- To mitigate cost risk – Ofwat should introduce an adjustment for chemical RPEs and reduce the frontier shift from 1% to 0.8% (see 2.4.3).
- To mitigate operational performance risk – restore some deadbands; reconsider the introduction of asymmetric skew for C-MEX; reconsider the level of baseline performance; and reconsider the inclusion of growth assumptions in the non-household demand performance commitment (see 2.5.2).

133. We summarise the results of our analysis in Figure 8 below. This shows the "pre-mitigations" risk at the DD, compared to the "post-mitigations" risk if these mitigations were applied.

FIGURE 8: RISK RANGES FOR THE DISTRIBUTION OF RETURNS FOR NORTHUMBRIAN WATER UNDER THE DD AND FOLLOWING PROPOSED MITIGATIONS

	Pre-mitigations			Post-mitigations		
Component	**P90**	**P10**	**P50**	**P90**	**P10**	**P50**
Wholesale totex	1.39%	-1.94%	-0.28%	1.35%	-1.59%	-0.12%
Retail totex	0.01%	-0.04%	-0.01%	0.01%	-0.04%	-0.01%
Outcome delivery incentives	0.01%	-1.95%	-0.97%	0.75%	-1.18%	-0.22%
Customer measures of experience	0.41%	-0.30%	0.06%	0.57%	-0.30%	0.14%
Revenue & other	0.00%	-0.05%	-0.03%	0.00%	-0.05%	-0.03%
Overall RoRE risk	**1.82%**	**-4.28%**	**-1.23%**	**2.68%**	**-3.15%**	**-0.24%**

Source: Northumbrian Water analysis, excludes financial

134. Before our proposed mitigations, the expected loss across costs and ODIs would be -1.23%. If the mitigations outlined above were made, the expected loss would reduce to -24bp, which seems reasonable if we accept that some asymmetry in the ODI package by design is appropriate. There would need to be an equal upside

[44] Bank of England forecasts, August 2024

allowance elsewhere to make sure that this is still a fair investment – this can be achieved by aiming-up on the allowed CoE, which we address in section 3.

135. Ofwat's estimate of expected outperformance on financing cannot be used to offset an expected loss from operating activities, as we describe in section 2.6.

3. INVESTABILITY

3.1. SUMMARY

3.1.1. The importance of correctly calibrating allowed returns at PR24

136. Investors see investment in water assets as riskier than it was at PR19 – and they are right. This is due to: much larger enhancement programmes; tougher regulatory and compliance requirements (including a higher-powered incentive regime for PR24); continued industry underperformance for AMP7; and public perception of water company performance, which in turn increases political and regulatory risk.

137. Against this backdrop of increasing risk, we will need to raise £2.9bn of new capital, to fund our very large enhancement programme – and at least £400m of which will need to be new equity. It is therefore essential that the allowed return is calibrated correctly, so this new capital can be raised.

138. In the DD, Ofwat has materially understated both components of the allowed return – the allowed cost of equity (CoE); and the allowed cost of debt (CoD). We can show this is the case through looking at sense checks, and by comparing this to recent debt market data and rating agency reports.

139. Firstly, we present four sense checks on the CoE that strongly support Ofwat's allowed return on equity being set too low:

- Ofwat's point estimate for the allowed return on equity of 4.8% (real-CPIH) is c.50bp below the 5.3% (real-CPIH) that would have been set by the CMA for the allowed return on equity if they were to apply their approach from the PR19 Redeterminations using current market data[45].
- Ofwat's allowed return on equity is 40bp below the 5.2% midpoint of its own implied CoE from the Market-to-Asset Ratios (MARs) of the listed water companies (that is, 4.2%-6.2%).
- Ofwat's allowed return on equity offers just c.110bps additional return to that available on bonds that were recently issued by Severn Trent or United Utilities[46] (both of which have a capital structure in line with the notional company) and 130bp additional return to a market-wide benchmark for investment grade bonds[47]. This is very low. As a comparison, analysis by Moody's shows that since PR04 the average additional return to equity, compared to debt, within Ofwat's allowed return has been c.340bp[48]. Regardless, offering just 110bp additional return for investing in equity rather than debt, especially in light of the heightened risk

[45] Our estimate of 5.3% is calculated using the parameter-level estimates that were set by the CMA in its PR19 Redeterminations, except for the Risk-Free Rate, which has been set at a level that we consider reflects the CMA's methodology using currently available market data (which is discussed in Section 3.3) and the notional gearing level, which has been set at 55% in line with Ofwat's proposal in its DD,
[46] A fixed rate bond issued by United Utilities Water Finance PLC that matures in May 2051 was issued on 28 May 2024 at a yield of 5.78%. A fixed rate bond issued by Severn Trent Utilities Finance PLC that matures in July 2038 was issued on 31 July 2024 at a yield of 5.92%.
[47] We take the average yield on the iBoxx GBP Non-financials 10+ A and BBB indices as our market-wide benchmark for investment grade bonds.
[48] August Moody's Report, Exhibit 8. 340bp is a simple average of the additional equity premia from PR04 to PR19, using Ofwat's own allowed returns. This rises to an average of 360bp if the CMA's PR19 figures are included.

environment at PR24, simply isn't an attractive proposition to equity investors, at a time where substantial new equity needs to be raised.

- Ofwat's allowed CoE is c.20bp below the allowed CoE in Ofgem's Sector Specific Methodology Decision (SSMD) for ET (where 55% gearing is applied). This implies that water is less risky than energy. But, the water sector faces heightened public and political attention, a much higher powered regime and much lower levels of expected performance against the base return, compared to energy.[49]

140. We know that the allowed return on equity directly affects financial ratios used by credit rating agencies and debt market participants when pricing debt. Ofwat's understated CoE is therefore playing out in debt markets, with new water company bonds being recently issued at a material 39bp premium to Ofwat's own investment-grade market benchmark.[50] This not only means that Ofwat's allowance for new debt costs (which is based on an unadjusted market benchmark) is materially below the actual CoD faced by water companies, but it also further supports the finding that Ofwat's allowed CoE is too low. Importantly, this phenomenon of issuing at a material premium to the market benchmark applies across the industry, including those firms that have the same capital structure as Ofwat's notional company.[51] This strongly suggests that the debt premia on water bonds is increasing because of issues with the regime, rather than company-specific financing decisions.

141. A mis-calibrated CoE and CoD is not in the interests of customers. If we cannot attract the capital needed, then we cannot deliver the improvements and investments that our customers expect. If we cannot attract the equity capital needed, that will risk both notional and actual financeability – which will mean a higher cost of capital in the future, leading to higher bills.

3.1.2. Ofwat's allowed CoE is materially understated due to downward bias in each parameter

142. The reason for Ofwat's materially understated CoE is a downward bias across the three fundamental components of the CAPM – that is: Total Market Return (TMR), beta and Risk-Free-Rate (RFR) - and a failure to aim-up for the inherent asymmetry in the package.

143. Ofwat's range for **TMR** is based on long-run historical data – both outturn equity returns (long-run ex post) and forward-looking expectations of equity returns (long-run ex ante). However, as analysis by Kairos Economics in their accompanying TMR report shows, Ofwat's long run ex ante figure of 6.3% is substantially understated due to reliance upon flawed input data. When Ofwat's long-run ex ante approach is updated using data from the widely used, including by Ofwat, Dimson Marsh and Staunton (DMS) publication, the TMR estimate is in fact 6.9% real CPIH, which is broadly in line with the CMA's 6.8% figure from PR19.

[49] August Moody's Report, page 7.
[50] KPMG, Estimating the Cost of New Debt and Additional Borrowing Costs for PR24 (the KPMG New Debt and Additional Debt Costs Report'), Slide 22.
[51] KPMG New Debt and Additional Debt Costs Report', page 21.

144. Ofwat sets its midpoint for estimates of the unlevered **beta** at 0.27, compared with the CMA's point estimate of 0.29 for the PR19 Redeterminations. This is not credible given the risk profile of PR24 compared to PR19. Ofwat's beta is depressed because it places too much weight on the Covid period, which artificially distorts beta downwards (as recognised by the CMA), and because it places weight on rolling betas which exacerbate this problem by overweighting certain periods (as well as not being statistically robust). A simple roll-forward of the CMA's approach at PR19 supports an unlevered beta of 0.29. Importantly, our 0.29 unlevered beta estimate is before any adjustment is made for an increase in forward-looking risk, due to the higher risk nature of the PR24 settlement, which KPMG estimates would increase the unlevered beta to 0.35.[52]

145. In calculating the **RFR**, Ofwat places sole weight on index-linked gilts (ILGs), disregarding CMA PR19 precedent and the evidence that a convenience yield exists, which depresses the ILG rate below the 'true' RFR and does not represent a risk-free lending and borrowing rate. Again, simply rolling-forward the CMA's approach from PR19, using CEPA's estimate (Ofwat's own consultants), supports a RFR of 1.99% (real-CPIH), compared to Ofwat's estimate of 1.43% (real-CPIH).

146. Ofwat recognises that if there is **asymmetry** in the expected return on equity (that is, on average investors cannot expect to earn the allowed CoE) then **aiming-up** may be required. This is in order to provide an equal upside allowance and ensure the DD allows for a fair return for investors. However, Ofwat wrongly concludes that there is no asymmetry in the package. Our analysis shows an expected loss of 26bp for NWL (after the targeted amendments to costs and ODIs we propose in section 2), which is consistent with a number of penalty only ODIs in the package, rendering it asymmetric by design. This supports the need to aim-up by a similar level to the CMA at PR19, being 25bp on the CoE. We recognise that Ofwat has already aimed-up on its CoE but this appears to be (although it is not clear) because its mid-point for the CoE is below the range implied by market valuations. We consider that rather than making an arbitrary and unclearly justified adjustment to its overall CoE because market valuations suggest it is too low, Ofwat should instead take note of the many cross checks that show its underlying CAPM parameters are downwardly biased, revisit its underlying CAPM parameters and correct for the errors that we have identified at source, before aiming-up under the asymmetry criterion.

147. Correcting for the above errors in Ofwat's CoE would increase the allowed CoE from 4.8% to 5.4%, which is broadly in line with simply rolling forward the CMA approach from PR19.

148. More generally, throughout the CoE assessment Ofwat rejects new analysis put forward by companies and recent regulatory precedent, in particular the CMA's PR19 decision, and simply reverts to its historical approach. Ofwat should welcome and engage with new models and techniques that advance the evidence base, rather than finding reasons not to engage with evidence and reverting to its historical methods. This is even more important at

[52] KPMG Cost of Equity Report, page 10.

PR24, given the substantial amount of new capital that needs to be raised and investor sentiment around the riskiness of water and the regime, which Ofwat itself acknowledges.

3.1.3. Ofwat's allowed CoD is below the CoD of an efficient company with the notional capital structure

149. Ofwat sets its embedded cost of debt allowance (CoD) based on both industry-wide actuals and a 'notional:actual' approach, with index-led approaches used as a cross check. If we use Ofwat's approach, there are three main omissions from the CoD (which we list below). Ofwat should correct for these omissions in order to get an accurate estimate.

- Firstly, the allowance does not currently incorporate refinancing and new issuances, in line with expected RCV growth between Ofwat's cut-off date and March 2025. KPMG estimates that incorporating the new debt required to finance RCV growth up to March 2025 at current market expectations of the cost of new debt for water companies would increase the cost of embedded debt by 27bp.[53]
- Second, Ofwat has not adjusted for below-par issuances of index-linked debt, which results in the overall cost of debt estimate being depressed (as below-par issuances result in the yield being above the coupon). KPMG estimates the impact of this adjustment to be 7bp.[54]
- Third, Ofwat excludes swaps on the basis that a notional efficient company would not need to use these instruments. However, nearly all companies in the sector routinely use swaps and they consider these to be part of an efficient issuance strategy. Further, it is an arbitrary distinction to differentiate between a single instrument (that is, a fixed rate bond) and two instruments (that is, a floating rate bond and an interest rate swap), with the same net cashflows and risk exposure. KPMG estimates that including swaps increases the embedded cost of debt by 11bp.[55]

150. KPMG estimates that correcting for these omissions would increase Ofwat's estimate of the median all-in cost of embedded debt from 4.55% to 5.04% nominal.[56]

151. Ofwat sets a new debt allowance based on an unadjusted A/BBB 10yr+ iBoxx index. However, this understates the cost of new debt for water companies. KPMG analysis shows that firms across the sector are now issuing at a c.39bp premium to the iBoxx A/BBB 10yr+. Importantly, even those firms that have capital structures in line with the notional company are experiencing a premium to the market benchmark. If Ofwat does not provide an allowance that is above the benchmark it is clear that an efficient water company with the notional capital structure could not raise debt in line with its allowance, introducing an expected cost that is not funded.

[53] KPMG Cost of Embedded Debt Report, page 11.
[54] KPMG Cost of Embedded Debt Report, page 11.
[55] KPMG Cost of Embedded Debt Report, page 11.
[56] 4bp additional delta is for other minor differences in KPMG vs Ofwat methodology.

152. Correcting for the above errors in Ofwat's cost of embedded and new debt would increase the overall allowed CoD from 2.86% to 3.49% (real CPIH), which is broadly in line with our actual CoD. Correcting for the above errors in Ofwat's cost of embedded and new debt would increase the overall allowed CoD from 2.84% to 3.51% (real CPIH), which is broadly in line with our actual CoD.

153. For the purposes of our revised CoD estimate, we have taken Ofwat's approach to the CoD as given. However, we have concerns with setting the CoD allowance based on industry-wide actuals. This is because where the cost of debt is based on industry-wide actuals, the financing assumptions for the notional company effectively follow the average outturn financing assumptions across the sector. It is therefore very difficult for us to identify and then follow a prudent treasury strategy that tries to minimise risk by not deviating from the notional company – because we cannot know the notional financing assumptions that the sector will on average adopt in future. Ofwat should set out a clear policy on the cost of debt with clarity on how they would expect a prudent company to 'hedge' the regime, by replicating the notional company financing structure.

3.1.4. Correcting Ofwat's allowed return

154. We present an allowed return in Figure 9 below that adopts the changes described above, using a data cut-off of 31 March 2024 (unless otherwise specified), which is in line with Ofwat's data cut-off.

155. As we set out in 3.1.2, the CoE is broadly in line with a roll-forward of the CMA's approach at PR19 (as well as being in the middle of Ofwat's own implied CoE from MARs). Importantly, the CoE in Figure 9 does not capture the increase in forward-looking risk at PR24, nor does it aim-up to account for the higher market implied equity returns in the current environment. It should therefore be considered as the minimum required CoE. As we set out in 3.1.3, the CoD takes Ofwat's approach as given, whilst correcting for material omissions and capturing the current market evidence that water companies are issuing at a significant premium to market-wide benchmarks.

156. We note that this compares, for example, to the RIIO3 cost of equity range of 4.57% to 6.35%[57].

157. We provide more evidence and detail on each of our points in the sections below (3.2 to 3.4).

[57] Per Moody's report, 60% gearing

FIGURE 9: COMPARISON OF THE COMPONENTS OF THE COST OF CAPITAL

CPIH Stripped Component	Ofwat DD	Our DD Response
Gearing	55%	55%
Risk-free rate (RFR)	1.43%	1.99%
Total market return (TMR)	6.58%	6.90%
Equity risk premium (ERP)	*5.15%*	*4.91%*
Debt beta	0.100	0.075
Unlevered beta	0.273	0.290
EV Gearing	53%	53%
Asset beta on PR19 basis	*0.326*	*0.33*
Notional equity beta	*0.602*	*0.64*
Aiming Up	0.27%	0.25%
Cost of equity	**4.80%**	**5.39%**
Proportion of embedded debt	72.5%	74%
Cost of new debt	3.36%	3.97%
Cost of embedded debt	2.46%	2.98%
Additional debt costs	0.15%	0.27%
Overall cost of debt	***2.84%***	***3.51%***
Appointee WACC (vanilla)	**3.72%**	**4.35%**
Retail net margin deduction	0.06%	0.06%
Wholesale WACC	**3.66%**	**4.29%**

Source: Ofwat Risk & Return Appendix – Allowed Return Appendix. Northumbrian Water analysis. Cost of debt figures rely upon KPMG analysis in the KPMG New Debt and Additional Debt Costs Report and KPMG Cost of Embedded Debt Report, which adopt a June 2024 cut-off date.

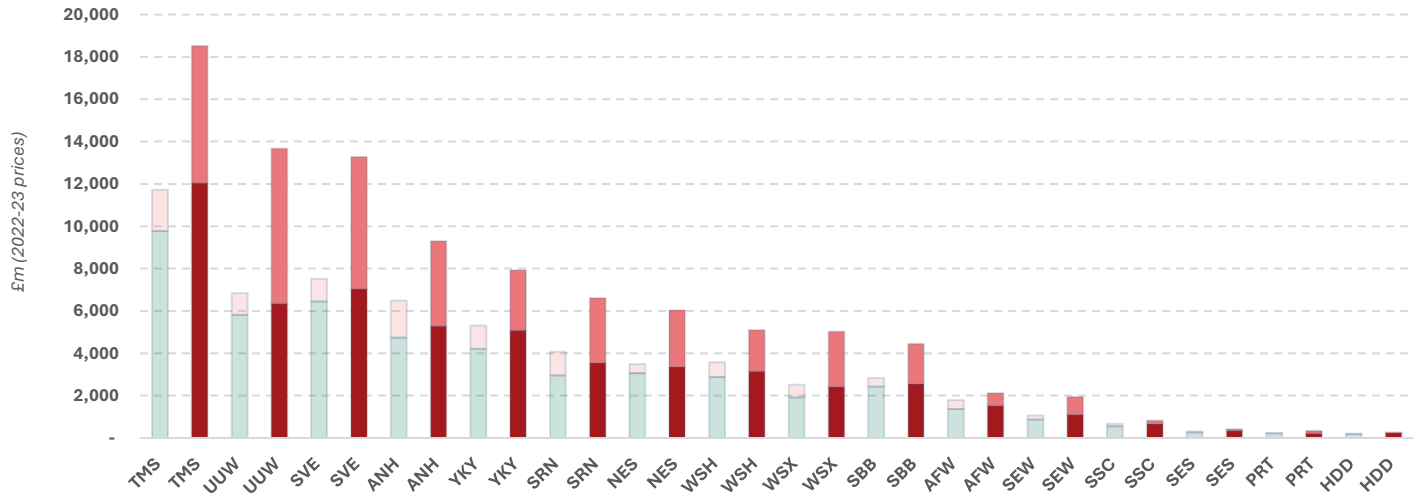
Note – The Cost of Debt values used in the financial model and business plan table RR1 are lower than the 3.51% value as set out here. This is due to late changes in the KPMG analysis made after we closed down the datatables. The RR1.19-22 Nominal cost of debt should be 5.58%, adding a further £1 to customer bills.

3.2. THE IMPORTANCE OF CORRECTLY CALIBRATING THE ALLOWED RETURN AT PR24

3.2.1. PR24 is more risky, yet substantial new capital needs to be raised

158. PR24 marks a step-change in the amount of investment in water assets since PR19. Company business plans include a net total expenditure of £95.8bn, which is 63% higher than expenditure allowances for PR19. In particular, enhancement expenditure proposals were 270% higher than allowances for PR19. Although Ofwat has made large cuts to enhancement expenditure between business plans and the DD, the scale of the investment programme is still much larger than PR19. Figure 10 below illustrates this point graphically.

FIGURE 10: BASE AND ENHANCEMENT EXPENDITURE ALLOWANCES FOR PR19 AND PROPOSALS FOR PR24 BY WATER COMPANY



Source: Northumbrian Water analysis

159. So, substantial new equity and debt capital therefore needs to be raised across the sector. Northumbrian Water needs to raise £2.9bn of new capital, of which around £400m is new equity capital.

160. This new capital needs to be raised against a backdrop of increasing risk for investors. For example, Ofwat cited an April 2024 Barclays survey within which debt and equity investors rated water the riskiest utility sector and the U.K. the riskiest European country.[58]

161. We discuss this increasing risk in greater detail in section 2. In summary, this is driven by:

- The increase in the capital investment itself, which is inherently difficult to forecast accurately, generating heightened cost risk and a greater risk of missing performance commitments associated with the capital projects.
- Ofwat's under-funding of base and capital expenditures, compared to business plans, which results in an expected loss and an increased risk of not meeting performance commitments.
- Ofwat's step-change in the range of penalties and rewards around ODI, resulting in a 'higher powered' regime.
- Much tougher target performance commitment levels, which also results in an expected loss.
- Heightened political and regulatory scrutiny, creating a general trend for a tougher approach to regulation in water, which is being borne out both in the DD package but also legal action being taken outside of the

[58] Barclays, 'UK Utilities: Survey results: How investible is UK Water? Uncertainty prevails', 23 April 2024

regulatory penalty regime, such as under the recent proposed enforcement order that Ofwat has issued following their sewage investigation.[59]

162. This means that the proposition to investors is one of increasing risk and likely underperformance against the base allowed return. This is consistent with the report that Moody's published in August, which says that:

> *"We believe that the water sector faces heightened public and political attention, and much higher powered and adverse operational performance incentives embedded in the DD may prevent water companies from achieving the allowed returns."*[60]

3.2.2. Importance of setting the correct CoE and CoD

163. To raise new equity capital, it is essential that the allowed CoE matches the market return for the risks that investors face and that investors can expect to earn the allowed CoE, on average i.e. the investment is a 'fair-bet'. In this section, we refer to this collectively as a correct calibration of the allowed CoE.

164. If investors cannot achieve the allowed return, and if the allowed CoE is not in line with the risks investors face, then investors will simply invest their capital elsewhere. In turn, we may not be able to raise the equity capital we need, risking the deliverability of our investment programme.

165. In addition to this, the allowed return on equity, including any uplift for asymmetry serves an important role in debt financeability (and therefore the CoD). That is, the allowed CoE serves as an 'equity buffer' that ensures that sufficient profits remain to pay interest on debt financing. If the allowed CoE is too low, and/or the cost and ODI package is miscalibrated such that there is a mean expectation of earning a return below the allowed CoE, then the equity buffer is insufficient. There is therefore a risk to debt financeability, and so the cost of debt increases.

166. This is not in the interests of customers. We would not be able to deliver the investment programme that customers expect. Risks to our financeability due to a miscalibration of the CoE would increase the risk of both equity and debt capital, so increasing bills over the long-term due to a higher cost of capital in future. Any reduction in debt financeability due to an insufficient equity buffer would put the investment grade rating at risk, which would also increase bills over the long-term due to a higher cost of debt in future.

167. To raise new debt capital at efficient levels it is essential that:

- The allowed cost of debt is in line with the cost of debt that would be incurred by an efficient company, with the notional capital structure.

[59] Thames, Yorkshire and Northumbrian Water face £168 million penalty following sewage investigation - Ofwat
[60] August Moody's Report, page 7

- There is sufficient equity buffer (based on the allowed CoE level and companies being able to achieve this – that is, costs are properly funded and performance commitments can be met by an efficient company) to support an investment grade credit rating, given: the assumed investment grade rating in the notional capital structure; the license condition for companies to maintain two-investment grade ratings; and the benefits that an investment grade rating has for customers in terms of maintaining access to debt finance at efficient interest rates.

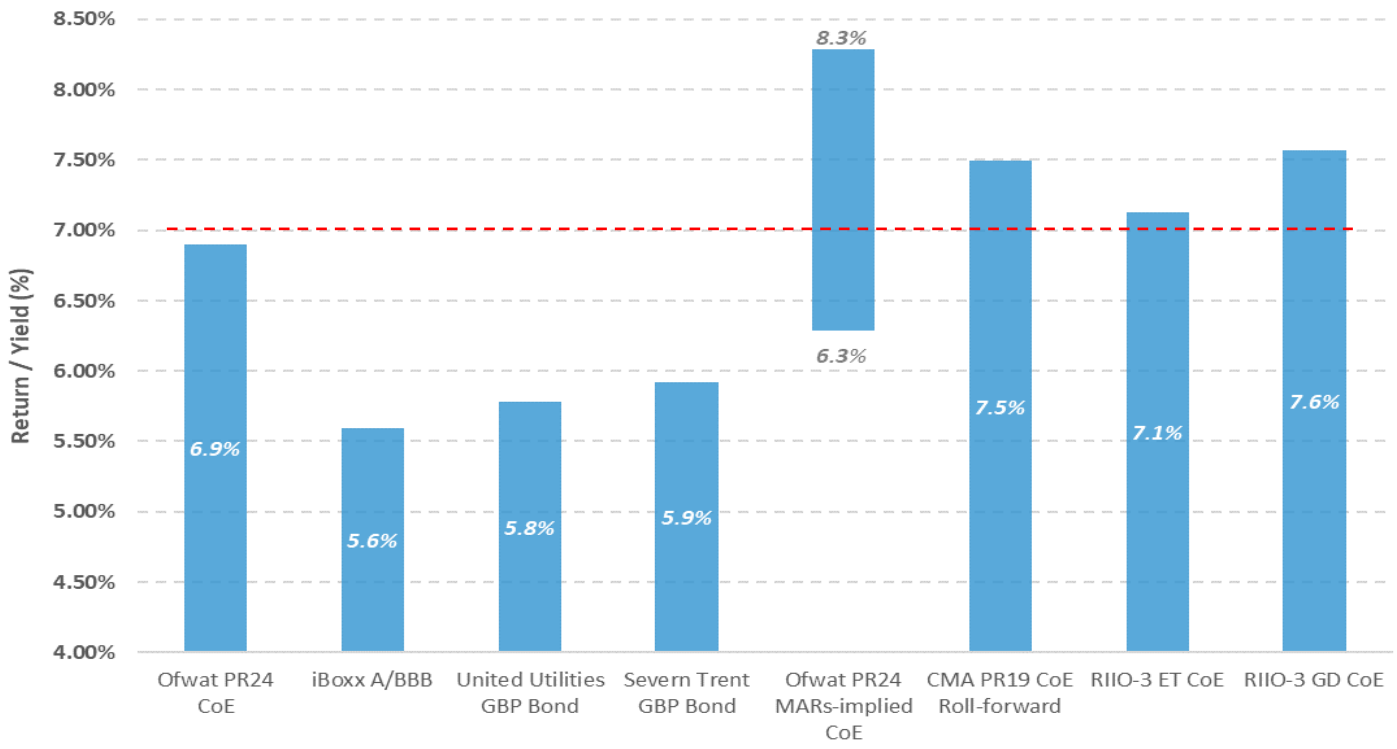
168. If the allowed CoD is lower than the CoD of an efficient company with the notional capital structure, this introduces an additional unfunded cost, which would serve to worsen any asymmetry in expected equity returns, such that investors cannot expect to earn the allowed CoE, further exacerbating the issues described at paragraph 165 above.

3.2.3. Ofwat has mis-calibrated both the CoE and CoD

169. In the DD, Ofwat has materially understated both components of the allowed return – the allowed cost of equity (CoE); and the allowed cost of debt (CoD). We provide detailed empirical evidence of this, including with reference to the underlying components of the CoE and CoD in sections 3.3 and 3.4.

170. We can show this is the case through looking at sense checks, and by comparing this to recent debt market data and rating agency reports.

FIGURE 11: COST OF EQUITY COMPARED TO OTHER BENCHMARKS



Source: Northumbrian Water analysis

171. Figure 11[61] compares Ofwat's allowed return on equity to a number of 'common sense' checks, all of which demonstrate that Ofwat's CoE is materially understated.

172. In particular, we note that from Figure 11:

- Ofwat's CoE is c.60bp below the CoE that would be set by the CMA if the PR19 CoE were updated for current market data on the RFR only (that is, systematic risk) and the total equity market return expected by investors were assumed to be consistent with PR19. These are reasonable (indeed likely prudent) assumptions, given the change in risk between PR19 and PR24 and the current market environment.

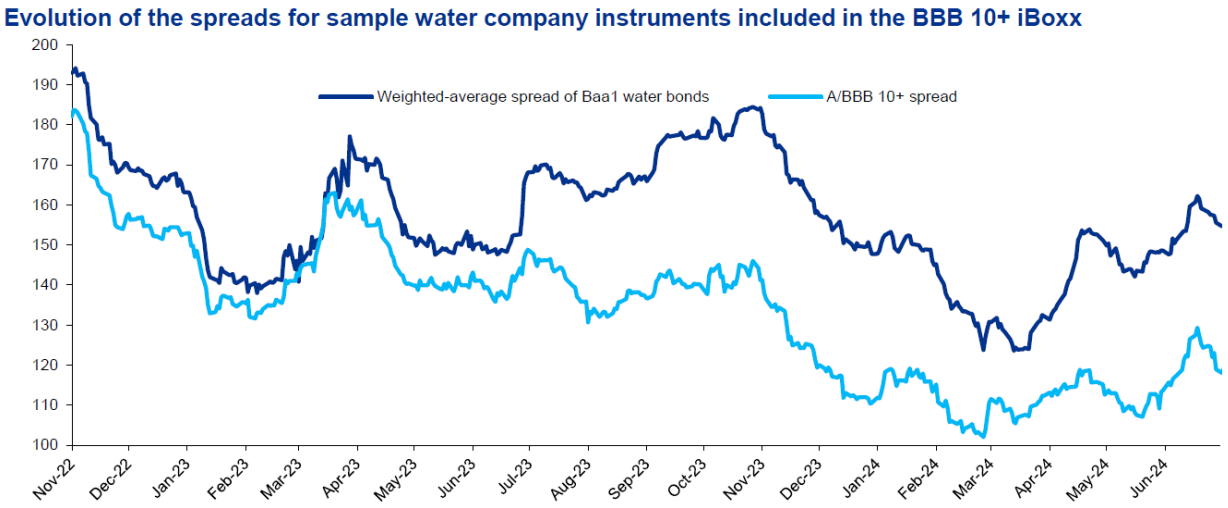
[61] Benchmarks shown in Figure 11 are calculated on the following basis: 'Ofwat PR24 CoE' shows Ofwat's point estimate for the PR24 CoE in nominal terms; 'iBoxx A/BBB' shows the average yield on the iBoxx GBP Non-financials 10+ A and BBB indices at 31 July 2024; 'United Utilities GBP Bond' shows the yield at issuance on a fixed rate bond that was issued on 28 May 2024 by United Utilities Water Finance PLC, which matures in May 2051; 'Severn Trent GBP Bond' shows the yield at issuance on a fixed rate bond that was issued on 31 July 2024 by Severn Trent Utilities Finance PLC , which matures in July 2038; 'Ofwat PR24 MARs-implied CoE' shows the range of the implied cost of equity in nominal terms from Ofwat's analysis of Market-to-Asset ratios in its 'PR24 Draft determinations: Aligning risk and return: Allowed return appendix'; 'CMA PR19 CoE Roll-forward' shows the return that would have been set by the CMA for the allowed return on equity if they were to apply their approach from the PR19 Redeterminations using current market data; 'RIIO-3 ET CoE' and 'RIIO-3 GD CoE' shows the calculated cost of equity based on midpoints of Ofgem's parameter ranges from its 'RIIO-3 Sector Specific Methodology Decision – Finance Annex' (18 July 2024) for ET and GT sectors.

- Ofwat's allowed CoE is well below the mid-point of its own implied CoE from the Market-to-Asset Ratios (MARs) of the listed water companies. Here, Ofwat forecasts the expected cashflows to equity for the listed companies, taking into account a range for expected outperformance and RCV growth, before solving for the implied CoE that equates the present value of the cashflows to the current market capitalisation.[62] The fact that Ofwat's allowed CoE is below the implied CoE is even more problematic given that Ofwat's MARs analysis is almost certainly understating the implied CoE, because it assumes real RCV growth of 0-2%, which is materially below the forecast RCV growth of the listed water companies and below Ofwat's sector-wide assumption of c.4%, used in its cost of debt analysis.[63]
- Ofwat's allowed return on equity offers just c.110bps additional return to that available on bonds that were recently issued by Severn Trent or United Utilities[64] (both of which have a capital structure in line with the notional company) and 130bp additional return to a market-wide benchmark for investment grade bonds[65]. In comparison, analysis in the August Moody's Report finds that since PR04 the average additional premia to equity, compared to debt, within Ofwat's allowed return has been c.340bp.[66] Stepping back, offering just 100bp additional premia for holding equity rather than debt, especially in light of the heightened risk environment at PR24, simply isn't an attractive proposition to equity investors, at a time where substantial new equity needs to be raised.
- Ofwat's allowed CoE is c.20bp below the allowed CoE in Ofgem's Sector Specific Methodology Decision (SSMD) for ET (where 55% gearing is applied). This implies that water is less risky than energy. But, the water sector faces heightened public and political attention, a much higher powered regime and much lower levels of expected performance against the base return, compared to energy.[67]

173. It is therefore evident that, even before getting into the detail of Ofwat's derivation of its allowed CoE that Ofwat's CoE allowance doesn't pass various common sense checks and is significantly understated. As explained at paragraph 165, an incorrectly calibrated CoE risks debt financeability and financial resilience, which we would expect to increase the cost of debt. This is bearing true in the market data, as Figure 12 below illustrates.

[62] Ofwat DD, Allowed Return Appendix, Table 11.
[63] Ofwat DD, Allowed Return Appendix, Page 90.
[64] A fixed rate bond issued by United Utilities Water Finance PLC that matures in May 2051 was issued on 28 May 2024 at a yield of 5.78%. A fixed rate bond issued by Severn Trent Utilities Finance PLC that matures in July 2038 was issued on 31 July 2024 at a yield of 5.92%.
[65] We take the average yield on the iBoxx GBP Non-financials 10+ A and BBB indices as our market-wide benchmark for investment grade bonds.
[66] August Moody's Report, Exhibit 8. 340bp is a simple average of the additional equity premia from PR04 to PR19, using Ofwat's own allowed returns. This rises to an average of 360bp if the CMA's PR19 figures are included.
[67] August Moody's Report, page 7.

FIGURE 12: KPMG ANALYSIS OF THE EVOLUTION OF WATER COMPANY SPREADS AND THE IBOXX A/BBB 10YR+SPREAD



Source: KPMG New Debt and Additional Debt Costs Report, slide 23.

174. Figure 12 above shows KPMG's analysis of recent water company issuances, compared to the iBoxx A/BBB 10yr +. It is evident that there is a significant premium for water company bonds. Indeed, KPMG estimates an average spread of 39bp to the iBoxx A/BBB 10yr+.[68] This not only demonstrates that Ofwat's allowed cost of new debt is too low (because it bases the allowance on the unadjusted iBoxx A/BBB 10yr+) but also that the equity buffer is too low, which is driving up the premia compared to market benchmarks. Whilst in theory this increase in debt premium could be due to the actual financing choices of water companies deviating from the notional structure and introducing 'too much' risk, the evidence suggests that this is not the case and that the phenomena is sector-wide and a function of the regime. More specifically:

- Firms across the sector are experiencing an increase in their costs of debt, not just those firms that have actual financing structures that differ from the notional structure. Indeed, even those firms with gearing in line with Ofwat's 55% assumption are experiencing the phenomena.[69]
- Recent rating agency reports, accompanying downgrades and/or decisions to put companies on negative watch cite the regime, in particular the tough DD for their decisions. For example:
  - The August Moody's Report concludes: *"The DD imposes tough cost and performance targets and proposed returns may be insufficient to attract the equity funding required to support the sector's increasing investment needs. We view the DD as a response to significant public and political concerns over service levels, particularly on wastewater treatment. If the risk-return balance remains unchanged at final determination (FD), currently expected in December 2024, this would, in our view, weaken the*

[68] KPMG New Debt and Additional Debt Costs Report, slide 22.
[69] KPMG New Debt and Additional Debt Costs Report, slide 21.

stability, predictability and supportiveness of the regulatory framework and hinder companies' ability to consistently recover their costs and earn an adequate return."[70]

- In a decision to put SWW on negative watch, Moody's stated *"Ofwat's draft determination for AMP8 carries the risk of significant operational penalties that could result in an AICR persistently below guidance for the current rating. The negative outlook reflects the risk that the final determination will maintain this negative bias."*
- In its decision to downgrade Thames, Moody's stated *"Thames Water's outlook remains negative, reflecting the increased likelihood that the final determination expected later this year would deter existing or new shareholders from providing sufficient additional equity during the next regulatory period to allow the company to deliver its investment programme."*

175. Overall, against a backdrop of increasing risk and the need to raise substantial equity and debt capital, Ofwat has materially mis-calibrated the allowed return – both in terms of the absolute level of the allowed return and in calibrating the package as a whole so that investors can expect to earn the allowed return on average. This bears true when compared against common sense checks for the allowed CoE and recent debt market data, which show water companies are issuing at a significant premia to market-wide benchmarks. If Ofwat continues with mis-calibrated CoE and CoD allowances in the FD it risks underinvestment and counterintuitively a higher cost of capital and therefore consumer bills over the long term, neither of which are in the consumer interest.

3.3. COST OF EQUITY

3.3.1. Introduction

176. Despite the importance of getting the allowed CoE correct, Ofwat has erred by setting its CoE too low, due to errors in each of the underlying components and not providing a commensurate uplift for the inherent asymmetry in the package.

177. We address each of the components in turn, as well as the need to aim-up for asymmetry in this section.

3.3.2. Total Market Return (TMR)

178. In its DD, Ofwat sets the TMR using long-run ex post and long-run ex ante approaches.

179. Long-run ex post estimates rely upon historical UK equity market returns using data from the Dimson-Marsh-Staunton Global Returns 2024 (DMS) dataset, which are deflated using a composite historical series based on the CED, and the CPIH ONS back-cast and official series. Weight is placed on estimates that are calculated using an

[70] August Moody's Report, page 1.

arithmetic average of overlapping 10- and 20-year real returns, with adjusted geometric average of returns used as a cross check.

180. Long-run ex ante estimates of expected UK equity market returns are derived using two methods. First, an approach that is based on the long-run properties of average fundamental dividend yield and growth data to estimate the unconditional expected return is used ('The Fama French Method'). Ofwat relies on data from the Barclays Equity Gilt Study (the 'Barclays Study') when employing The Fama French Method. Second, the 'Decomposition Method' from DMS, which decomposes historical returns into average dividend yield, dividend growth and expansion in the ratio of price to earnings. The method supposes that the component of historical returns that is attributable to the expansion in the ratio of price to earnings is likely to be non-repeatable. The return implied by remaining components is then taken to be an estimate of investors' ex ante expectations of the TMR.

181. Under the long-run ex post approach, Ofwat deflates nominal historical UK equity market returns using a composite historical series based on the CED, and the CPIH ONS back-cast and official series. In contrast, under the long-run ex ante approach, Ofwat relies on the Barclays Study and DMS when applying the Fama French Method and Decomposition Method respectively, which incorporate inflation series that are based on the COLI, rather than the CED. To account for this inconsistency, Ofwat applies a downward adjustment of 35 basis points (the 'CED/COLI Adjustment').

182. The results of Ofwat's analysis described above are set out in Figure 13 below.

FIGURE 13: OFWAT'S TMR RESULTS IN THE DD

Method (real CPIH)		Estimates	Mid-point
Long-run ex ante	Fama French Method	5.98%	6.29%
	Decomposition Method	6.60%	
Long-run ex post	10-year overlapping	6.81%	6.87%
	20-year overlapping	6.93%	

Source: Tables 3 to 6 of Ofwat's DD, Allowed Return on Capital Appendix, as summarized in the Kairos TMR Report

183. Ofwat uses the midpoints from its long-run ex ante and long-run ex post approaches, which are shown above, to form its estimated range for the TMR (i.e. 6.29% to 6.87%.). This range has a midpoint of 6.58%.

184. Kairos Economics has reviewed Ofwat's estimate of the Total Market Return (TMR) in its DD, the details of which are set out in their accompanying report 'A review of Ofwat's Total Market Return', dated 26 August 2024 (the 'Kairos TMR Report') (NES90). The Kairos TMR Report finds that Ofwat's long-run ex ante estimates are flawed for two main reasons:

- First, the data underlying the Barclays Study are unlikely to be robust. This has been demonstrated by multiple academic studies that have examined the underlying constituents of the Barclays dataset. For

example, the Barclays Study contains no railway companies in the earlier part of the data period, whereas railway companies made up the majority of listed companies during the early period.

- Second, Ofwat's use of the CED/COLI Adjustment is an unnecessary approximation, when robust data are available that may be used to address the inconsistency in the underlying inflation series directly.

185. The above issues can be addressed following the release of the DMS dataset for 2024. This dataset provides sufficient underlying data on historical nominal total returns and capital gains to apply the Fama French Method and the Decomposition Method to robust data on historical UK returns that have been deflated using the CED/CPIH inflation series directly. Combining the DMS dataset for 2024 with the CED/CPIH inflation series:

- Removes the requirement to rely on data from the Barclays Study, which has been shown is unlikely to be robust; and,
- Establishes that the introduction of the CED/COLI adjustment is unnecessary and inaccurate.

186. Figure 14 presents Kairos' revised estimates for the Fama French Method and Decomposition Method using historical nominal total returns and capital gains from DMS that have been deflated using the CED/CPIH inflation series. A revised estimation range for the TMR under Ofwat's approach of using the midpoints under the long-run ex post and long-run ex ante approaches is also presented.

FIGURE 14: OFWAT'S TMR RANGE WITH CORRECTED EX ANTE FIGURES

(real-CPIH)			Mid-point
Long-run ex ante	Fama French Method	6.92%	6.89%
	Decomposition Method	6.85%	
Long-run ex post	10-year overlapping	6.81%	6.87%
	20-year overlapping	6.93%	

Source: Kairos TMR Report

187. Correcting Ofwat's long-run ex ante estimates for Kairos' concerns results in an updated estimate for the TMR of c.6.9% in real CPIH terms, using Ofwat's approach of taking the midpoints of its long-run ex post estimates, and the revised long-run ex ante estimates. This is broadly in line with (albeit 10bp above), the CMA's PR19 estimate of 6.8% real, CPIH. Indeed, given the regulatory precedent – accepted by Ofwat and set out in the UKRN cost of capital guidance[71] – of setting the TMR based on long-run historical data and assuming that the TMR is broadly stable over time, we would only expect modest changes from one period to the next.

[71] UKRN guidance on the methodology for setting the cost of capital | UKRN: the UK Regulators Network

3.3.3. Risk Free Rate (RFR)

188. Under the CAPM framework, the RFR is the rate of return that investors can expect to earn from an investment in a riskless asset. In practice, no instrument is truly risk-free, and so it must be estimated.

189. In the DD, Ofwat considers that RPI-linked gilt yields are appropriate proxies for the RFR[72] and it places sole weight on an average of 20-year RPI-linked gilt yields during March 2024, which it calculates to be 1.10%, (which is in real RPI terms by design) [73]. Ofwat expresses this RPI-based figure in CPIH terms, using an average of the 'wedge' between RPI and CPIH inflation that is implied by forecasts from the Office for Budget Responsibility (OBR) in its 'Economic and fiscal outlook' (published in March 2024), and 20-year RPI and CPIH swap rates, which it calculates to be 0.34%[74]. Ofwat sets 1.43% as its point estimate for a RFR in real-CPIH terms (no range is provided) [75].

190. In forming its estimate of the RFR, Ofwat disregards arguments and evidence provided by other risk-free proxy instruments. Ofwat considers the arguments in support of a convenience yield but concludes that there is 'insufficiently strong evidence to accurately calibrate an adjustment at our preferred 10-20 year horizon for RPI-linked gilt yields'[76]. Ofwat cites the CMA's consideration of the Brennan (1971) framework in its PR19 Redetermination, which motivates the CMA's use of 20-year RPI-linked gilt yields and iBoxx GBP Non-Gilt AAA 10+ and 10-15 nominal indices (both of which are converted to CPIH-real estimates). Ofwat concludes that adoption of the Brennan framework would not make a meaningful difference to its estimate for the RFR due to its finding that the difference between the average of 20-year nominal gilt yields and the AAA yield used by the PR19 CMA panel in March 2024, was only 3 basis points[77]. Ofwat proposed to consider long-term SONIA swap rates as a potentially useful cross-check in its Final Methodology but notes in its DD that while SONIA carries negligible default or liquidity risk premium, SONIA swaps require collateralization, making them less 'intuitively interpreted'[78] than other risk-free proxies.

191. In considering how to account for forecast risk of the RFR, Ofwat rejects the use of forward rate adjustments due to its position that they have poor predictive power for future relevant gilt yields[79]. Ofwat considers that a one-month averaging window remains appropriate, balancing the benefits of more recent data with a longer historical period to protect against unusual intraday yield volatility.

[72] Ibid., p.23
[73] Ibid., p.23
[74] Ibid., p.24
[75] Ibid.,p.24
[76] Ibid., p.12
[77] Ibid., p.17
[78] Ibid., p.19
[79] Ibid., p.21

192. Ofwat's approach, which we summarise above, is likely to materially understate an appropriate RFR for PR24, contributing to an allowance for the cost of equity that is insufficient. This is because:

- Ofwat places sole weight on RPI-linked gilt yields as an appropriate proxy for the RFR, disregarding valuable evidence from alternative proxies that suggest RPI-linked gilt yields are an underestimate for the true RFR; and
- Ofwat incorrectly disregards the precedent set by the CMA in its PR19 Redeterminations to place equal weight on 20-year RPI-linked gilt yields (rebased to CPIH terms) and iBoxx GBP Non-Gilt AAA nominal yields.

3.3.4. Ofwat's sole reliance on RPI-linked gilts

193. Ofwat considers that RPI-linked gilts are likely to embed a degree of liquidity risk, default risk and term premium[80]. Ofwat also does not reject the existence of a convenience yield but rejects only that there is strong evidence that it may be accurately calibrated at its preferred horizon for RPI-linked gilts. These four factors – which Ofwat itself acknowledges exist - generate a discrepancy between observed RPI-linked gilt yields and the yield of a truly risk-free asset and introduce a significant risk of misestimation of the RFR. Therefore, placing sole weight on a single source of data that is known to suffer from distortions, is unlikely to be a prudent approach that minimizes estimation error of the RFR.

194. Investors may be willing to sacrifice a level of return, or convenience yield, to hold government bonds issued by countries with high credit ratings that possess 'money-like' characteristics. There is therefore a risk that index-linked gilt yields might be lower than the true RFR. There is a considerable base of evidence in support of the existence of a material convenience yield. Ofwat's review of four academic studies finds an estimated convenience yield of 0.38% for 2-year UK gilts[81], and average convenience yield estimates in excess of 0.3% for the US[82]. Although studies are largely focused on the US, Diamond and Van Tassel (2021) find convenience yields in excess of 0.15% for two-year maturities across the US, UK, Eurozone, Switzerland and Canada[83]. CEPA's implementation of the CAA's H7 approach of comparing yields of constituent bonds in the iBoxx AAA Non-Gilt 10+ index with yields of benchmark nominal gilts with similar maturity, finds an average spread of 0.23% (excluding outliers), which may fall to 0.12% after removing the effects of heightened liquidity and default risks[84]. Ofwat assesses KPMG's analysis, which follows a similar approach to the CAA by comparing yields on AAA-rated RPI-linked bonds with the maturity-matched point on the RPI-linked gilt yield curve. KPMG proposes an adjustment of 0.66% to account for the convenience yield (which Ofwat considers is not suitable due to the short weighted average remaining life and thinly-traded nature of the bonds in its sample[85]). While there is significant

[80] Ibid. p.16
[81] W. Diamond, P. Van Tassel, 'Risk-Free Rates and Convenience Yields Around The World', November 2021, Table 1, p12
[82] Ofwat, 'PR24 Final Methodology: Appendix 11 Allowed return on capital', December 2022, Table A1.1
[83] W. Diamond, P. Van Tassel, 'Risk-Free Rates and Convenience Yields Around The World', November 2021, Table 1, p12
[84] CEPA, 'PR24 Cost of Equity', 11 July 2024, p.97
[85] Ofwat, PR24 DD Aligning risk and return: Allowed return appendix, p.13

uncertainty across estimates of the convenience yield (or associated adjustments), the estimates presented above are materially greater than zero. Ofwat does observe that the 'starting point' for the estimate of the convenience yield, being the difference between the average 20y nominal gilt yield and the iBoxx GBP non-gilt AAA-rated 10+ and 10-15 indices, is -3bps[86]. However, a simple comparison between gilt yields and an aggregate index is unlikely to provide a robust indication of the level of the convenience yield, because of differences in other confounding factors, such as the maturity of the underlying instruments. Ofwat's position that there is insufficiently strong evidence to accurately calibrate an adjustment at its preferred horizon for RPI-linked gilts is therefore not a reasonable basis to treat the convenience yield as if it were zero. The evidence summarized above suggests that Ofwat's decision to do so, whilst placing sole weight on RPI-linked gilt yields, is likely to generate an estimate for the RFR that is materially biased downwards.

3.3.5. Ofwat's disregard of the CMA's PR19 precedent

195. In practice, market participants are likely to face a divergence between the rates at which they can lend and borrow, which is captured under the Brennan (1971) framework[87]. Under this framework, the market equivalent risk-free rate is shown to lie between the lending rate and borrowing rate. If it is accepted that market participants face a divergence between lending and borrowing rates, and lending rates of market participants are reasonably taken to be in line with yields on RPI-linked gilts, then placing sole weight on yields on RPI-linked gilts will underestimate the true RFR.

196. In its PR19 Redetermination, the CMA noted that 'evidence provided on both the presence of a convenience yield within ILG yields and on market RFRs with different borrowing and lending rates suggest that the appropriate RFR for our CAPM is likely to sit above the ILG yield. On the basis of this evidence, we consider it unlikely that the yield on ILGs is a perfect representation of a theoretical RFR (or the average market participant rate in the Brennan approach). We consider that, on balance, it is likely that the RFR appropriate for a range of relevant investors sits above the return available from ILGs, but below the level suggested by the return on AAA bonds'[88].

197. The CMA concluded in its PR19 Redetermination that the midpoint from the range generated by rebased 20-year RPI-linked gilt yields and iBoxx GBP Non-Gilt AAA nominal yields presents a reasonable estimate of the market RFR[89]. It is clear from the CMA's reasoning in Paragraph 24 that its methodology is driven by placing weight on a combination of evidence supporting the presence of a convenience yield within RPI-linked gilts, and the divergence of borrowing and lending rates for market participants. Therefore, Ofwat's decision to dismiss an adjustment for a convenience yield or for divergent lending and borrowing rates breaks with precedent set by the CMA at PR19, and results in an estimate for the RFR that is downwardly biased.

[86] Ibid., p.13
[87] Brennan, 'Capital Market Equilibrium with Divergent Borrowing and Lending Rates', December 1971
[88] CMA, PR19 Redetermination, para.9.264
[89] Ibid., para.9.265

198. CEPA estimates a differential of 1.11% between lending and borrowing rates under its implementation of the CMA's approach at PR19[90]. Following the CMA at PR19, we propose an appropriate estimate for the RFR using midpoint of the implied range, which results in 1.99% in real-CPIH terms[91].

3.3.6. Beta

199. The parameter beta within the CAPM framework is a measure of an asset's non-diversifiable risk relative to the broader market. Beta is not observable and so must be estimated.

200. In its DD, Ofwat's beta estimation methodology requires consideration of the set of listed comparators for which historical data will be gathered, the period and frequency over which data will be observed, and the approach to the estimation of gearing and debt beta levels for use with the Harris-Pringle formula to estimate beta in levered and unlevered terms.

201. Ofwat places weight on data provided by the listed comparators Severn Trent and United Utilities. It considers estimates based on 'spot' and rolling averages over one, two and five-year averaging periods of beta estimates at daily, weekly and monthly frequencies, for two, five and ten-year estimation windows[92]. Ofwat places greater weight on estimates using daily data due to the increased statistical precision of estimates and robustness to the 'reference day effect', and on two and five-year trailing averages of beta estimates over five and ten-year estimation windows because capturing 15 years' worth of data is more reflective of the comprehensive range of systematic risk events that a notional water company might encounter[93]. Ofwat sets a range for its estimates for unlevered beta of 0.258 – 0.287, with a midpoint of 0.272[94].

202. In setting its range of estimates for beta, Ofwat rejects arguments and evidence in support of accounting for an effect of the sizeable programme of capital expenditure for PR24 on systematic risk faced by companies. This is because it does not consider that the plausible magnitude of an increase in risk justifies a departure from its stated approach and considers that current proposals to capture the increased risk are either flawed from a theoretical perspective or risk worsening beta accuracy[95]. Ofwat disregards placing weight on Pennon, National Grid, and construction companies as alternative listed comparators. This is because: (i) Viridor, Pennon's waste management business that was divested in 2020, could not be considered as having a similar beta to a 'pure-play' water company, thus justifying the exclusion of Pennon; (ii) National Grid is governed by a different regulatory framework, has non-network activities and material US operations; and (iii) construction companies do not benefit from the risk protections enjoyed by the regulated water sector[96]. Ofwat considers that reweighting observations

[90] CEPA, 'PR24 Cost of Equity', 11 July 2024, p.96
[91] This estimate is the sum of Ofwat's point estimate of the RFR (1.43%), plus half of the differential calculated by CEPA (0.56%).
[92] Ofwat DD, Allowed Return Appendix, pages 53-54.
[93] Ofwat DD, Allowed Return Appendix, page 55.
[94] Ofwat DD, Allowed Return Appendix, page 56.
[95] Ofwat DD, Allowed Return Appendix, page 47.
[96] Ofwat DD, Allowed Return Appendix, page 50.

or omitting data relating to the period affected by COVID-19 or Russia-Ukraine war is unnecessary because the exercise requires a degree of judgement, compromising the simplicity and transparency of its proposed approach[97].

203. Ofwat's approach to the estimation of beta:

- Incorrectly disregards well-founded conceptual arguments that the increase in risk facing companies for PR24 due in part to the sizeable programme of capital expenditure for PR24, is likely to increase the systematic risk for companies when compared with PR19.
- Incorrectly disregards the precedent set by the CMA in its PR19 Redeterminations to place less weight on lower estimates for beta that are calculated using data that includes the period of the Covid-19 pandemic.
- Incorrectly disregards Pennon, even though it now represents a pure-play water company.

204. As a result, Ofwat's approach is likely to materially underestimate an appropriate beta for PR24, contributing to an allowance for the cost of equity that is insufficient.

205. Conceptually, the beta associated with an asset is increasing in its relative riskiness versus the risk of the market portfolio. In other words, an increase in the relative risk of an investment will lead mechanically to a higher beta, all else equal. As outlined in section 3.2, investment in water assets is perceived as more risky by investors than it was at PR19, which is due in part to the sizeable enhancement programmes planned, tougher regulatory and compliance requirements (including a higher-powered incentives regime), continued industry underperformance for AMP7, and heightened political and regulatory risk from current public perceptions of water company performance. Under the reasonable assumption that the correlation between returns from investments in existing water assets or new water projects and the market portfolio remains constant, an increased riskiness of water investments will lead to a higher beta for PR24 than for PR19.[98]

206. Following a comprehensive examination of the evidence reviewed for its PR19 Redeterminations, the CMA set a range for its estimate for unlevered beta of 0.28-0.30 with a midpoint of 0.29. For the reasons set out at paragraph 203, we would expect a credible estimate of beta to be at least as high as the CMA's estimate for PR19 of 0.29. However, not only is Ofwat's midpoint estimate of 0.272 for unlevered beta in violation of this principle, but Ofwat's entire range for its estimates for unlevered beta of 0.258 – 0.287 is too. This suggests that Ofwat materially underestimates an appropriate beta for PR24.

[97] Ofwat DD, Allowed Return Appendix, page 52.
[98] Ofwat's argues in its DD (Ofwat DD, Allowed Return Appendix, Annex 2) that the correlation between the returns of an asset and the market portfolio cannot safely be assumed to be constant because it is equal to the quotient of their covariance and the product of their standard deviations, which decreases with the standard deviation of the asset's returns, all else equal. Whilst the definition of correlation is accurate, this argument is circular. Correlation is defined to be a normalised measure of covariance that lies between -1 and +1, which facilitates comparison across sets of variables that may differ in a number of ways. As such, an assumption of constant correlation between regulatory periods is a reasonable approach. Ofwat's argument, which relies on holding the covariance between the returns of an asset and the market portfolio and the standard deviation of the return of the market portfolio constant, is unlikely to hold in practice.

207. The CMA's approach to setting an appropriate value for beta during its PR19 Redeterminations considers beta estimates based on 'spot' and rolling averages over one, two and five-year averaging periods of OLS-generated estimates at daily, weekly and monthly frequencies, for two, five and ten-year estimation windows[99]. It excludes outliers that are either 1.5 times the interquartile range (IQR) greater than the third quartile, or 1.5 times the IQR less than the first quartile[100]. The CMA also considers that whilst the pandemic represents a systematic event which should not be excluded from its estimates, it recognises that this type of economic crisis is relatively rare and that it is likely to be over-weighted[101]. Accordingly, the CMA places less weight on lower estimates for beta that are calculated using data that includes the period of the Covid-19 pandemic[102]. Similarly, the CAA applied an adjustment to its 'baseline beta' to reflect the risk of events similar to the Covid-19 pandemic occurring in the future, and to ensure the impact of the pandemic was not over-represented in its asset beta estimate[103]. It calculated the adjustment by reweighting data that were observed during the Covid-19 pandemic[104]. On appeal, the CMA determined that the CAA was not wrong in respect of calculating the impact of the pandemic on the relevant asset beta[105]. We have examined the effect of the Covid-19 pandemic on OLS estimates of beta using daily data for a capitalization-weighted portfolio of Severn Trent and United Utilities over a 10-year estimation window without averaging[106]. We apply the CMA's approach to the range of estimates for unlevered beta up to 31 March 2024 provided by CEPA and presented by Ofwat[107], which results in a range of estimates for unlevered beta of 0.27 – 0.30 after adjusting for our estimate of the effect of the Covid-19 pandemic.

208. The recent evidence provided by consideration of Pennon as a listed comparator, which has been a 'pure-play' water company since the sale of Viridor, Pennon's waste management business that was divested in 2020, suggests that the range proposed at paragraph 207 may be prudent[108], if more recent evidence is taken into account. This suggests that Ofwat materially underestimates an appropriate beta for PR24.

209. Furthermore, the use of rolling averages to estimate beta places greater weight on data observed in the middle of the overall estimation period than on data observed towards the start or end of the period. Therefore, Ofwat's reliance on rolling averages to derive its estimate for beta places unequal weight across the set of observations without a reasonable justification for doing so. Ofwat considers that the use of two and five-year trailing averages

[99] CMA PR19 Final Report, para.9.479.
[100] CMA PR19 Final Report, para.9.474.
[101] CMA PR19 Final Report, para.9.493.
[102] Ibid.
[103] CMA 'H7 Heathrow Airport Licence Modification Appeals Final Determinations' (October 2023), para.6.13
[104] CMA 'H7 Heathrow Airport Licence Modification Appeals Final Determinations' (October 2023), para.6.24
[105] CMA 'H7 Heathrow Airport Licence Modification Appeals Final Determinations' (October 2023), para.6.158
[106] Our approach considers OLS regression of daily returns of a capitalization-weighted portfolio of Severn Trent and United Utilities on daily returns of the FTSE All-Share index over a 10-year estimation window without averaging. We introduce a 'dummy variable' to represent the Covid-19 period between 23 March 2020, when the Prime Minister of the UK ordered the first national lockdown, and 19 July 2021, when most legal limits on social contact were removed (https://www.instituteforgovernment.org.uk/sites/default/files/2022-12/timeline-coronavirus-lockdown-december-2021.pdf). The estimate of the effect of the Covid-19 pandemic to be applied to derived ranges based on CEPA's analysis of unlevered beta estimates is calculated as the difference in the beta coefficients between regressions that include and exclude the dummy variable, which is delevered using the average portfolio gearing over the period. We find that the period of the Covid-19 pandemic had an effect of reducing unlevered beta estimates.
[107] Ofwat DD, Allowed Return Appendix, Table 8.
[108] KPMG Cost of Equity Report, figure 7.

of five and ten-year beta estimates captures 15 years' worth of data and thus reflects a more comprehensive range of systematic risk events which a notional water company might encounter[109]. However, we see no reason why Ofwat's position of relying on long-term data to capture a comprehensive range of systematic risk events is not better achieved by relying simply on spot beta estimates of comparable length. It is also important to note that standard errors cannot be computed for rolling averages (whereas they can be for spot estimates), which risks placing weight on changes in beta from 'eye-balling' charts, which are simply noise in the data.

210. By incorporating evidence that a credible estimate of beta should be at least as high as the CMA's estimate for PR19 of 0.29 to represent the heightened risk facing water companies in PR24, which is incorrectly disregarded by Ofwat, and deriving a range that follows precedent set by the CMA in the PR19 redeterminations, we consider that an appropriate estimate of the unlevered beta for PR24 is at least as high as 0.29. It is important to note that i) 0.29 is contingent on implementation of the mitigations we set out in section 2 and ii) it is inherently based on historical data, which doesn't reflect any change in risk in the PR24 package. Depending on the market's view of the PR24 FD, future data may suggest that 0.29 understates forward-looking risk. Indeed, KPMG analysis of forward-looking beta suggests an unlevered beta of 0.35.[110]

211. The evidence presented in Ofwat's Final Methodology for PR24 for debt beta, with no additional evidence presented in its DD, is not sufficient to justify a change from the estimate proposed by the CMA following a comprehensive examination in its PR19 Redeterminations. Therefore, we propose that Ofwat should retain the CMA's midpoint estimate for debt beta at PR19 of 0.075[111].

3.3.7. Selecting a point estimate for the CoE

212. In its DD, Ofwat considers the following four factors when determining whether to select a point estimate that is above (or below) its central estimate; cross checks from market evidence, welfare impacts from underinvestment, asymmetry in the package and CAPM parameter uncertainty.[112] We discuss each area in turn before considering Ofwat's overall conclusion and offering an alternative approach.

3.3.8. Cross checks from market evidence

213. Ofwat considers three main cross checks from market evidence; market to asset ratios (MARs), differentials in debt vs equity risk premia and multi-factor models.

214. Ofwat calculated an implied cost of equity range from the MARs of SVT, UU and Pennon, as its primary cross check from market evidence, which is consistent with the UKRN guidance on the cost of capital.[113] Ofwat

[109] Ofwat DD, Allowed Return Appendix, page 55.
[110] KPMG Cost of Equity Report, page 10.
[111] CMA PR19 Final Report, Table 9-19.
[112] Ofwat DD, Allowed Return Appendix, page 59.
[113] UKRN cost of capital guidance, page 27.

estimates an implied CoE range of 4.2% to 6.2% from this analysis.[114] Ofwat considers that this does not indicate a clear case for aiming off its mid-point of 4.5%.[115]

215. Ofwat has not published the underlying models behind its MARs analysis. However, we consider that the implied CoE that Ofwat has derived is understated because Ofwat's real RCV growth range of 0% to 2% is inconsistent with forecast RCV growth for the listed comparators it uses. Indeed, in the cost of debt analysis, Ofwat assumes a 6% average nominal RCV growth,[116] which would equate to c.4% real RCV growth. We consider that Ofwat should update its MARs analysis for more accurate RCV growth estimates, based on the actual forecasts of SVT, UU and Pennon and update its implied CoE range accordingly. This would serve to increase the implied CoE range from Ofwat's MARs analysis. Notwithstanding this concern, even Ofwat's artificially depressed implied CoE range demonstrates that Ofwat's CoE is too low, with Ofwat's CAPM-derived mid-point of 4.5% being just 30bp above the lowest point in the 200bp implied CoE range and 70bp below the mid-point. This suggests that Ofwat should revisit the underlying parameters within its CoE estimate and provides top-down support for our concerns that each of the underlying components are depressed.

216. Ofwat considers that evidence on the differential between equity and debt premia is insufficiently reliable to underpin a cross-check to the cost of equity.[117] It further considers that a small differential between equity and debt premia is not necessarily problematic if i) outturn inflation is used to derive a nominal CoE, which is in practice what investors will receive and ii) a long-term approach to the TMR is taken, which inherently results in periods of over- or understating market expectations of near-term equity performance. Ofwat therefore concludes that it is not appropriate to place weight on debt-premia cross checks when choosing a point estimate.[118]

217. While we agree with Ofwat that the analysis could be done using break-even inflation to convert it's real CoE into nominal terms, we note that Ofwat uses 2% CPIH throughout its WACC analysis, so consistency requires the same inflation estimate is used for this sense check. Moreover, as the August Moody's Report demonstrates, even adjusting for break-even inflation, the delta between debt and equity premia at PR24 is substantially below previous Ofwat settlements.[119] We further agree with Ofwat that adopting a stable TMR approach will inherently lead to some periods where the wedge between equity and debt premia within the allowed return may be lower or higher than might be expected based upon the underlying risk exposure. However, the wedge between debt premia and Ofwat's equity premia is artificially reduced by more than it should be, even adopting a long-run approach to TMR. This is because of errors in Ofwat's underlying components – in particular the TMR and beta. When the CoE is estimated correctly the implied differential between equity and debt is more reasonable. In addition, whilst we are generally supportive of a long-run, stable approach to TMR approach (as long as it is

[114] Ofwat DD, Allowed Return Appendix, Table 11.
[115] Ofwat DD, Allowed Return Appendix, page 72.
[116] Ofwat DD, Allowed Return Appendix, page 90.
[117] Ofwat DD, Allowed Return Appendix, page 64.
[118] Ofwat DD, Allowed Return Appendix, page 72
[119] August Moody's Report, Exhibit 10

estimated accurately), it does risk the allowed CoE being below what investors could get from alternative investments at a time when significant new equity needs to be raised. There may therefore be a case for departing from this approach in a period where substantial new capital needs to be raised.

218. Ofwat does not use alternative models for estimating the CoE as part of its cross check analysis. We agree that the CAPM should be retained as the primary model for estimating the CoE. However, given the importance of the CoE in the overall settlement and the ubiquitous use of alternative models such Multi-factor models (MFMs) by investment practitioners, the absence of a cross check using an alternative model is a material omission to Ofwat's overall methodology. We therefore disagree with Ofwat's rejection of the MFM evidence on the basis that it *was* "*not convinced the benefits of adding this cost of equity cross-check would justify the significant increase in cost and challenges around replicability that curating such a model would entail*." Either Ofwat should derive its own MFM cross check or, identify an alternative, non-CAPM asset-pricing model which can serve as a cross check to its CAPM-derived CoE. An independent academic paper applies the MFM model to UK data and finds that listed water companies have a higher systematic risk exposure than is priced by the CAPM.[120]

3.3.9. Asymmetry in the package

219. Ofwat appears to accept that, should there be asymmetry in the package, then absent a commensurate upside allowance the package would not be a fair-bet to investors.[121] As a result, its consideration of whether it needs to select a point estimate above the mid-point for asymmetry within the DD is focused on whether or not asymmetry in the package exists. Ofwat concludes that the package is symmetric, so no aiming-up for asymmetry is required at PR24.[122]

220. As discussed in section 2, we have undertaken detailed analysis of the risk in the package across costs, ODIs and financing and find the following:

- Cost risk is still asymmetric (even after mitigants) but can be put more in balance by reducing frontier shift back to the business plan level (which was already amongst the most ambitious in the sector) and introducing an adjustment for real price effects on chemicals.
- Even with changes to PCLs, risk elements and incentives there is a demonstrable negative skew from ODIs.
- There should be no expected out or under performance on financing at the P50 for the notional company and, in any event, Ofwat's analysis of financing risk is incomplete/outdated.

221. In section 2 we propose targeted amends to the package, which brings it more into balance but still results in an expected loss of -26bp that warrants aiming-up on the CoE.

[120] See KPMG Cost of Equity Report, Section 9.2 and https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4933529
[121] Ofwat DD, Allowed Return Appendix, page 73. Ofwat does not use the language 'fair-bet' but simply notes that adjusting base returns may be necessary where the expected return on equity doesn't equal the base return/
[122] Ofwat DD, Allowed Return Appendix, page 70.

3.3.10. CAPM parameter uncertainty

222. In the DD, Ofwat explains that it considers whether the balance of evidence for individual CAPM parameters points towards the upper or lower end of the range, when selecting a point estimate for the CoE.

223. Ofwat considers that its RFR estimate is likely to be 'balanced' because it hasn't placed weight on 10 year gilts (which would be lower) and the 20 year ILG has not been adjusted downwards e.g. for default risk premia.[123] This is a biased assessment of where the weight of evidence lies on the RFR. Indeed, as outlined above, Ofwat's RFR is likely to be understated because it does not reflect the weight of evidence on the presence of a convenience yield nor the difference in the risk-free lending and borrowing rates. Therefore, while Ofwat does not produce a range for RFR, it is likely that its RFR lies at the lower end of reasonable RFR estimates.

224. Ofwat considers its TMR range to be 'balanced as a TMR expectation, based on historical data'.[124] As outlined above and in further detail in the Kairos TMR Report, Ofwat's long-run ex ante figures are depressed due to the use of the flawed Barclays dataset and an inaccurate proxy for the change in inflation series from COLI to CED. Correcting for these issues results in a TMR range, based on historical data that is materially above Ofwat's range in the DD. In addition, Ofwat's approach of adopting a stable TMR, whilst consistent with regulatory precedent, is likely to result in the market TMR being above the regulatory allowance in periods of higher interest rates.

225. Ofwat considers that the econometric evidence justifies unlevered beta figures that could be higher or lower than its mid-point estimate. However, this conclusion only holds if rolling betas are used and betas estimated across the covid period are given the same weight as other periods. As discussed above, the economic evidence does not support either of these assumptions. When only spot estimates are used and less weight is placed on the Covid period, the weight of evidence is at the top of Ofwat's range.

226. Across each of the three main parameters in the CAPM, it is evident that the balance of evidence supports estimates materially above Ofwat's point estimates. This should be corrected at the underlying parameter level, following the approach we suggest in the relevant parameter sections above.

3.3.11. Welfare impacts from underinvestment

227. Ofwat recognises that the sector needs to raise significant amounts of debt and equity financing across PR24 and that this investment will deliver longer-term service improvements to customers and the environment.[125] With little discussion of the rationale, Ofwat then states that "*adopting an allowed equity return above the mid-point of our*

[123] Ofwat DD, Allowed Return Appendix, page 70.
[124] Ofwat DD, Allowed Return Appendix, page 70.
[125] Ofwat DD, Allowed Return Appendix, page 71.

CAPM range in addition to targeted amendments to the risk and return package will further support the sector to raise the finance that is necessary…"[126]

228. Ofwat rejects the 'classical' rationale for aiming up for welfare reasons – being that the negative welfare implications of getting the CoE too low may outweigh the welfare implications of setting the CoE too high, on the basis that firms have little choice over whether or not to make investments under the regime.[127]

3.3.12. Overall conclusions on aiming-up

229. Having discussed the evidence under each of the considerations when selecting a point-estimate, Ofwat refers to the following two reasons for aiming-up by 27 basis points above its mid-point to arrive at an allowed CoE of 4.80%:

- Low valuations and low investor sentiment towards the water sector. It references an April 2024 Barclays survey, which finds that both debt and equity investors consider water to be the riskiest utility sector and the UK the riskiest European Country.[128]
- An allowed return on equity that is in the upper end of their range should support companies to secure external financing for the large PR24 investment programme.[129]

230. We agree with Ofwat that investor sentiment is low and the allowed CoE is important for securing external financing. However, it is not clear to us under which aiming-up consideration/criterion Ofwat's justification for aiming-up sits. The language in the DD suggests Ofwat's decision is based, at least in part on market cross checks (due to the reference to low valuations) and the welfare impacts of underinvestment. However, as explained above, Ofwat concludes that the MARs analysis does not suggest it needs to set a CoE above the mid-point[130] and that firms in practice don't have discretion on whether or not to invest.[131]

231. As a matter of principle, Ofwat should ensure it has an unbiased assessment of the CoE parameters before considering whether to aim-up, instead of retaining downward bias in its parameters and then adding an arbitrary uplift to the CoE, the rationale for which is unclear. Indeed, the following market cross checks suggest that Ofwat has understated the CoE and needs to revisit the underlying parameters:

- Ofwat's own cross checks, including its implied MARs analysis; and
- Additional cross checks submitted by KPMG and Oxera, using MFMs and debt market data. In this regard, we disagree with Ofwat's rejection of the MFM evidence on the basis that it was *'not convinced the benefits of*

[126] Ofwat DD, Allowed Return Appendix, page 71.
[127] Ofwat DD, Allowed Return Appendix, page 71.
[128] Ofwat DD, Allowed Return Appendix, page 74.
[129] Ofwat DD, Allowed Return Appendix, page 74.
[130] Ofwat DD, Allowed Return Appendix, Table 14.
[131] Ofwat DD, Allowed Return Appendix, page 71.

adding this cost of equity cross-check would justify the significant increase in cost and challenges around replicability that curating such a model would entail.' While we agree that the CAPM should be the primary tool, given the importance of the CoE in the overall settlement and the ubiquitous use of alternative models such as MFMs by investment practitioners, the absence of a cross check using an alternative model is a material omission to Ofwat's overall methodology. Either Ofwat should derive its own MFM cross check or, identify an alternative, non-CAPM asset-pricing model which can serve as a cross check to its CAPM-derived CoE.

232. More generally, it is disappointing that when presented with new, in-depth analysis by companies – such as the MFM analysis - that Ofwat simply rejects the evidence on the basis of complexity. Ofwat should welcome and engage with new models and techniques that advance the evidence base, rather than finding reasons not to engage with evidence and reverting to its historical methods. This is all the more important at PR24, given the substantial amount of new capital that needs to be raised and the investor sentiment around the riskiness of water and the regime, which Ofwat itself acknowledges.

Overall, we consider that rather than making an arbitrary and unclearly justified adjustment to its CoE, Ofwat should instead take note of the many cross checks that show its underlying CAPM parameters are downwardly biased, revisit its underlying CAPM parameters and correct for the errors that we have identified at source.

233. Figure 15 below shows that correcting the errors in Ofwat's CoE parameters at source yields a central point estimate CoE of 5.14%.

234. Then, when stepping through each of Ofwat's own criteria for whether to select a point estimate above (or below) the mid-point, it is clear that aiming-up is required under the 'asymmetry criterion', given the inherent asymmetry in the package (as explained in further detail in section 2: Risk). We adopt a 25bp aiming-up adjustment,[132] consistent with CMA PR19 and broadly in line with our residual estimate of -26bp of asymmetry, once the targeted changes to the costs and ODI package in chapter 2 are made. Adding this uplift for asymmetry to the mid-point supports a CoE of 5.4%.

[132] We note that this may underestimate the degree of aiming-up that would be required across the sector to ensure a fair-bet for equity investors because our risk analysis is based on NWL's expected performance against costs and ODIs and we have historically been an efficient, high-performing company on costs and ODIs

FIGURE 15: OFWAT COE COMPARED TO OUR CORRECT COE

CPIH Stripped Component	Ofwat DD	NWL DD Response
Gearing	55%	55%
Risk-free rate (RFR)	1.43%	1.99%
Total market return (TMR)	6.58%	6.90%
Equity risk premium (ERP)	*5.15%*	*4.91%*
Debt beta	0.100	0.075
Unlevered beta	0.273	0.290
EV Gearing	53%	53%
Asset beta on PR19 basis	*0.326*	*0.33*
Notional equity beta	*0.602*	*0.64*
Cost of equity mid-point	4.53%	5.14%
Aiming Up	0.27%	0.25%
Cost of equity	4.80%	5.39%

Source: NWL analysis

3.4. COST OF DEBT

3.4.1. Introduction and overview

235. Ofwat sets it's embedded cost of debt allowance based on both industry-wide actuals and a 'notional:actual' approach, with index-led approaches used as a cross check. Taking Ofwat's approach as given, we have identified a number of omissions from the allowance, which should be included in order to get an accurate estimate. In section 0, we explain these omissions and provide an adjusted estimate.

236. Ofwat sets a new debt allowance based on an unadjusted A/BBB 10yr+ iBoxx index. However, use of an unadjusted A/BBB 10yr+ iBoxx is not correct because it understates the actual average cost of new debt for water companies. We explain why this is the case and provide an adjusted cost of new debt estimate in section 3.4.6.

237. Ofwat has not provided a sufficient allowance for the cost of carry or the costs of hedging exposure to changes in the RPI-CPIH wedge, within its additional debt costs allowance. We provide evidence for this and provide an adjusted estimate in section 3.4.7.

238. Whilst we take Ofwat's overarching approach as given in this response, and following the corrections we set out our CoD is broadly in line with the overall allowed CoD, we have concerns with the incentive properties of setting the CoD based on sector-wide actuals. We explain this concern in further detail in section 3.4.3 and conclude with a recommendation that Ofwat sets out a clearer policy on the notional financial assumptions that it will adopt in the CoD going forwards, so that we can optimise our treasury strategy accordingly.

3.4.2. Corrections to Ofwat's embedded debt figure in the DD

239. KPMG has undertaken a sector-wide review of embedded debt in 'KPMG Cost Embedded Debt Report' (NES88), which explains a number of important changes that are required to Ofwat's approach and outturn allowance. We summarise three of the main omissions from Ofwat's embedded debt allowance, as outlined in the KPMG report, below.

240. Firstly, the allowance does not currently incorporate refinancing and new issuances, in line with expected RCV growth between Ofwat's cut-off date and March '25. Indeed, this is one of the main drivers of the difference between Ofwat's embedded debt estimates and KPMG's.[133] Ofwat acknowledges that this is an omission, so we expect this to be updated by the FD. Seeing as Ofwat's approach to embedded debt is based on the yield on actual water company bonds, we consider that the yield applied to this forecast new debt should be the current market expectations of the cost of new debt for water companies over the same period, which KPMG estimates to be A/BBB 10yr iBoxx +34bp.[134] KPMG estimates that incorporating the new debt required to finance RCV growth up to March '25 at current market expectations of the cost of new debt for water companies is 27 basis points.[135]

241. Secondly, Ofwat has not adjusted for below par issuances of index-linked debt, which results in the overall cost of debt estimate being depressed (as below par issuances result in the yield being above the coupon). KPMG estimates the impact of this adjustment to be 7bps on the 'all-in' median.[136]

242. Thirdly, Ofwat excludes swaps on the basis that a notional efficient company wouldn't need to use these instruments. The sector-wide actuals should capture all financing instruments issued by companies in the sector, it is unclear what justification there could be for removing instruments, if the intention is to capture the average cost of debt across the industry. Further, it is an arbitrary distinction to differentiate between a single instrument e.g. a fixed rate bond and two instruments e.g. a floating rate bond and an interest rate swap, with the same net cashflows and risk exposure. Nearly all companies in the sector routinely use swaps and consider they are part of an efficient issuance strategy. KPMG estimates that including swaps increases the embedded cost of debt by 11bp.[137]

243. KPMG estimates that correcting for the aforementioned omissions increases Ofwat's estimate of the median all-in cost of debt from 4.55% to 5.04% nominal.[138]

[133] Table A1 of the Allowed Return Appendix.
[134] KPMG Cost of Embedded Debt Report, Section 6.1.2.
[135] KPMG Cost of Embedded Debt Report, page 11.
[136] KPMG Cost of Embedded Debt Report, page 11.
[137] KPMG Cost of Embedded Debt Report, page 11.
[138] KPMG Cost of Embedded Debt Report, page 11. Nb there are minor differences for modelling of accretion (1bp) and 'other' (4bp).

3.4.3. Concerns with Ofwat's overarching approach to setting the cost of embedded debt

244. In section 0 above, we take Ofwat's approach as given and identify material omissions that should be corrected for. However, we have concerns with an approach to setting the cost of embedded debt that places significant weight on industry-wide actuals and does not fully parameterise the notional financing assumptions.

3.4.4. Rationale for a notional approach to the cost of debt

245. Regulators have tended to set a single allowance for an efficiently-financed company under their chosen notional financing assumptions (the 'notional' approach), as opposed to setting the CoD based on each firm's actual debt costs (the 'firm-specific' actuals approach).[7] 'Sector-wide' actuals have then been used as a cross check.

246. The notional approach should result in zero out/under performance for an efficient company that perfectly matches the notional financing assumptions set by the regulator. A company's actual cost of debt may deviate from the notional allowance because:

- It is inefficient i.e. it issues debt at a higher rate than an efficient water company; or
- Management deviate from the notional financing assumptions signalled by the regulator e.g. by issuing debt of a shorter tenor or taking on a greater mix of floating rate debt.

247. Under a notional approach, deviations (either positive or negative) due to inefficiency or management knowingly deviating from the notional financing assumptions should not be borne by customers but instead should sit with companies and their investors. In this way, the notional approach should incentivise efficiency and ensure that customers are not exposed to too much financial risk.

3.4.5. Ofwat's approach is not a notional approach and therefore departs from regulatory best practice

248. At PR19, Ofwat purported to follow a notional approach. It identified an index that it considered best approximated its notional financing assumptions and then took a trailing average of that index to derive the allowance.

249. However, at PR24, Ofwat adopts two approaches to setting its cost of embedded debt allowance:

- Sector-wide actuals – the so-called 'all-in' approach; and
- The notional:actual approach, which purports to derive an allowance for the notionally financed firm using actual water bonds and recalibrating this pool of bonds to reflect the notional financing assumptions (as opposed to selecting an index that closely represents the notional financing assumptions).

250. It is clear that at least 50% of the allowance is based on outturn sector-wide actual costs of debt. Moreover, even within Ofwat's notional:actual allowance, it does not recalibrate the estimate for important notional financing assumptions in particular - timing of issuance and tenor. The result is that these notional financing assumptions

automatically move in line with outturn sector-wide actuals. Ofwat's notional allowance may not therefore represent a cost of debt that could be achieved by an efficient company with the notional financing assumptions.

251. Going forwards, we request that Ofwat sets out a clear policy on the cost of embedded debt, including a full set of notional financing assumptions (covering timing of issuance and tenor as well as the mix of nominal/ILG debt). This policy should also provide guidance for the treasury strategy that it would expect a prudent, efficient company, to adopt, if it simply wishes to minimise risk by following the notional financing assumptions. Absent this clear policy guidance we are concerned that we do not know when we are taking on risk compared to the notional financing assumptions, and in turn where that risk will sit when it later crystalizes, which could create arbitrary winners and losers.

3.4.6. Cost of New Debt

252. We welcome Ofwat's removal of the outperformance wedge. However, Ofwat's analysis of whether water company bonds out or under-perform an index is only based on water bond issuances up to March 2023.[139] KPMG analysis of contemporaneous issuances (using data to June 2024), demonstrates that the cost of new debt for water companies is significantly above the iBoxx A/BBB 10 year+ and the iBoxx Utilities indices.[140]

253. Given that both of Ofwat's approaches to embedded debt rely upon the yields on actual water company bonds (with the actual:notional approach changing the weighting of floating fixed rate debt but still using the observed yields on actual issuances), consistency demands the use of this contemporaneous evidence on actual water company issuances, when setting the new debt allowance.

254. Moreover, as set out in section 3.2.3, this debt premium relative to the iBoxx is a sector-wide issue. This is important because even those firms that have capital structures in line with the notional company are experiencing a premium to the market benchmark. If Ofwat does not provide an allowance that is above the benchmark it is therefore clear that an efficient water company with the notional capital structure could not raise debt in line with its allowance, introducing an expected cost that is not funded.

255. KPMG proposes a 34bp adjustment to correct Ofwat's new debt allowance – based upon the mid-point of the following:

    a. Lower bound: 22bps, reflecting the like-for-like underperformance of all issuances post November 2022; and

[139] Figure 16 of the DD Allowed Return Appendix
[140] KPMG New Debt and Additional Debt Costs Report, slide 21.

b. Upper bound: 46bps, reflecting the underperformance of Baa1/BBB+ rated issuances post November 2022 when controlling for tenor.[141]

256. KPMG's approach results in a cost of new debt as at June 2024 of 3.97%, real CPIH.[142]

3.4.7. Additional debt costs

257. Ofwat's 15bp allowance for additional debt costs does not provide sufficient allowance for 'Cost of carry' and RPI-CPH wedge risk or 'Basis Risk'.

258. First, Ofwat's cost of carry estimate materially underestimates the costs incurred for holding debt capital 'on account' before deploying it in the RCV, which is when the allowance for the cost of debt will actually be earned. This is because Ofwat's 6 month pre-financing period (i.e. the period where debt is held 'on account') is too short and it underestimates the amount of refinancing that will take place in AMP8. KPMG analysis of evidence from companies and rating agencies found that no companies in their review had a minimum prefinancing period shorter than 12 months and that Ofwat's re-financing assumption of 12% is significantly below the actual re-financing requirements. KPMG estimates a revised cost of carry estimate of 13bp, which is 6bp above Ofwat's 7bp allowance.[143]

259. Second, RPI-CPIH wedge risk arises because when setting the cost of embedded debt, Ofwat uplifts the yields on actual water company's RPI-linked debt by the OBR's forecast of the RPI-CPIH wedge, when deriving a real-CPIH cost of debt allowance to apply to the RCV.[144] Should the outturn RPI-CPIH wedge differ to the OBR forecast used to derive the cost of debt allowance, then firms will either be over or under compensated for their RPI-linked debt. KPMG estimates that the costs of managing this exposure are 6bp.[145]

260. Correcting Ofwat's 15bp additional debt costs allowance for cost of carry and basis risk, results in a revised allowance of 27bp.[146]

[141] KPMG New Debt and Additional Debt Costs Report, slide 25.
[142] KPMG New Debt and Additional Debt Costs Report, slide 4.
[143] KPMG New Debt and Additional Debt Costs Report, slide 4.
[144] DD Aligning Risk and Return Appendix, page 18
[145] KPMG New Debt and Additional Debt Costs Report, slide 4.
[146] DD Allowed Return Appendix, page 93 has 5bp issuance costs and c.3bp liquidity costs (10bp total cost of carry and liquidity less Ofwat's 7bp cost of carry estimate). Added to KPMG's cost of carry and basis risk estimates gives; 5+3+13+6=27bp.

3.4.8. Overview of corrections to the allowed CoD

261. Figure 16 below takes Ofwat's approach as given and makes corrections for the omissions set out in this section.

FIGURE 16 - OVERVIEW OF CORRECTIONS TO OFWAT'S ALLOWED COD

	Ofwat DD
Ofwat CoD	2.84%
Re-financing and new issuances to March '25	+20 bps
Index-linked debt issued below par	+6 bps
Inclusion of swaps	+9 bps
Water co. premium on new debt	+16 bps
Additional debt costs	+12 bps
Other	+4 bps
Revised CoD	**3.51%**

Source: NWL analysis of KPMG New Debt and Additional Debt Costs Report and KPMG Embedded Debt Costs Report. Nb: both KPMG Reports adopt a June cut-off.

262. As explained in section 3.4.3, whilst for the purposes of this response we have taken Ofwat's approach as given, we have concerns regarding an approach that relies on sector-wide actuals because it is difficult to know in advance what notional financing assumptions will be implicitly adopted in the outturn cost of embedded debt allowance. Going forwards, we request that Ofwat sets out a clear policy on the cost of embedded debt, including a full set of notional financing assumptions (covering timing of issuance and tenor as well as the mix of nominal/ILG debt). This policy should also provide guidance for the treasury strategy that it would expect a prudent, efficient company, to adopt, if it simply wishes to minimise risk by following the notional financing assumptions. Absent this clear policy guidance we are concerned that we do not know when we are taking on risk compared to the notional financing assumptions, and in turn where that risk will sit when it later crystalizes, which could create arbitrary winners and losers.

4. FINANCEABILITY AND FINANCIAL RESILIENCE

4.1. SUMMARY

4.1.1. Ofwat's proposed additional protections for financial resilience are not well-evidenced and should be done via a separate licence modification process

263. Ofwat proposes three additional protections with the purpose of improving financial resilience by restricting dividend distributions (or imposing RCV deductions) where gearing levels exceed 70%.

264. While the introduction of well-founded, targeted measures to improve the financial resilience of the sector may bring benefits, Ofwat has not carried out an assessment that is sufficiently robust or well-evidenced, given the constraints that these measures may place on our ability to operate our business and raise finance effectively. Ofwat has not provided:

- Robust evidence that supports the existence of a systemic lack of financial resilience and that its cause is a result of undesirable financing decisions.
- An estimate of the net consumer detriment arising from the alleged lack of financial resilience.
- The results of its evaluation that the proposed measures are effective and proportionate within the full suite of potential remedies that generate benefits outweighing their costs.

265. In particular, Ofwat has not demonstrated that there is (or could be) a sector-wide financial resilience issue that is due to companies' actual financial structures. Rather, Ofwat simply illustrates that higher gearing increases the risk to equity - which should already be clear. Even if Ofwat were to demonstrate that companies' actual financial structures are causing (or could cause) a financial resilience issue, it has not considered a comprehensive range of remedy designs, such as glide paths or different gearing levels. We note that Ofgem's early proposals for RIIO-3 involve a license modification to block dividends after 75% gearing, based in part on this being above the gearing of all the energy networks that it would apply to and being in the middle of the permissible gearing ranges in actual gearing covenants within firm's loan agreements.

266. Ofwat should correct its proposed DD, before re-assessing whether there is indeed a financial resilience issue across the sector and in turn whether there is any net consumer harm to address. If Ofwat demonstrates that there is net consumer harm to address, then they should identify the full suite of potential remedies and undertake a robust cost benefit analysis of each. Not doing so risks exacerbating the issues associated with Ofwat's mis-calibrated CoE, as we would need to raise even more equity, in order to maintain financial resilience.

267. Ofwat proposes implementing its additional protections via an amendment to Ofwat's dividend guidance, an amendment to the licences of all companies or only to those companies where Ofwat has identified actions that are required to address weak levels of financial resilience, or at a subsequent price review. Ofwat's proposal to

restrict dividends on the basis of an unsupported gearing threshold would not be an appropriate use of its enforcement powers in respect of its dividend guidance, the purpose of which is to ensure that dividends paid take account of service delivery or performance levels. If a mechanism to improve financial resilience via the restriction of dividends where gearing levels exceed a given threshold were required, then a further revision to the ring-fencing licence conditions of companies with weak levels of financial resilience would be most suitable within the set of three options presented.

4.1.2. Ofwat's notional financeability relies on substantial new equity being raised and overlooks the impact of a material expected loss and unfunded costs during AMP8

268. Ofwat incorrectly concludes that an efficient notional company is able to raise the finance it requires on reasonable terms. This is, in part, because the allowed return on equity is insufficient to remunerate equity investors for the level of risk they face from an investment in water assets. Furthermore, Ofwat cannot be confident that long-term investors in water assets will continue to invest in an efficient company with the notional capital structure if its dividend yield is cut to 2%, even if the allowed return on equity were sufficient. This is because certain sets of investors are likely to prefer different payoff profiles according to factors such as their income preferences, tax situation, and funding arrangements of their own. Long-term investors that value the future success of the water sector and recognise its importance for stakeholders more broadly may prefer predictable, reliable dividend streams. As such, it would not be rational for investors to inject the required equity on which Ofwat's financeability assessment hinges.

269. Under the regulatory settlement specified in Ofwat's DD and on the basis of our assessment of an efficient level of costs (including the cost of capital) and service performance levels, an efficient company with the notional capital structure will be able to satisfy financeability constraints of target thresholds under relevant financial ratios by raising a substantial amount of new equity, only if Ofwat makes the following necessary corrections to the allowed return and risk in the regulatory settlement:

- Corrects its unfunded true-up mechanisms for business rates allowances (section 7.1.1), the energy cost adjustment (section 7.1.9) and contingent 'gated' capex (section 7.3.4), which create in-period cash shortfalls requiring additional financing and generating additional financing costs for the notional company.
- Addresses expected losses facing the notional company from cost allowances, due to an overly ambitious rate of improvement under Ofwat's proposal for frontier shift (see section 7.1.7).
- Addresses expected losses and mitigates the risk facing the notional company from volatile chemical prices by implementing an RPE true-up mechanism for chemical costs (see section 7.1.8).
- Implements targeted amendments to the package of ODIs to reduce the downside skew in returns and remove expected losses (see section 8).
- Sets an allowed return on equity and debt for the notional company that is commensurate with the rate of return that is required by investors.

- Sets a benchmark dividend yield that is considerably in excess of 2% for an efficient company with the notional capital structure.

4.1.3. We are financially resilient only if a number of targeted amendments are made to the DD

270. Ofwat has asked us to provide board assurance and supporting evidence to confirm and explain how we have assessed that we will maintain adequate levels of financial resilience in 2025-30.

271. On the basis of the regulatory settlement proposed by Ofwat in its DD, it is likely that we will only be able to maintain adequate levels of financial resilience in 2025-30 by injecting the required equity and lowering target rating thresholds for the actual company to Baa2/BBB level if Ofwat:

- Makes the necessary corrections to the allowed return and risk in the regulatory settlement that are required for a financeable regulatory settlement, which are set out in paragraph 269 above, and
- Reconsiders its proposed 'additional protections' that block dividends or reduce the RCV, when gearing of the actual company exceeds 70%.

4.2. OFWAT'S ADDITIONAL PROTECTIONS FOR FINANCIAL RESILIENCE

4.2.1. Ofwat's proposals

272. Ofwat says that there is a *"a threshold beyond which gearing levels should be considered as excessive for the successful operation of an incentive based regulatory regime."*[147] To address its concern for financial resilience in 2025-30 and in the longer-term, Ofwat considers several options for additional protections that it could implement to strengthen customer protections in relation to a company's choice of gearing, which include[148]:

- Signalling more firmly in its dividend guidance that a gearing level of 70% is an upper limit beyond which it would expect dividend yields to be restricted in the 2025-30 period.
- Revising the ring-fencing licence conditions of companies with weak levels of financial resilience to place a restriction on a company's ability to make distributions where gearing exceeds 70%.
- Treating distributions paid beyond a gearing threshold of 70% as an extraction of value, which would be met with an equivalent downwards adjustment to the RCV.

4.2.2. Context

273. We understand the importance of maintaining financial resilience for an incentive-based regulatory regime. We also understand the rationale behind a prudent regulator's wish to monitor the level of financial resilience of

[147] Ofwat DD, Aligning Risk and Return Annex, page 66
[148] Ofwat DD, Aligning Risk and Return Annex, page 69

regulated companies, intervene in situations where the financial resilience of a regulated company is inadequate, or remedy circumstances in which a regulated company is experiencing financial distress. We support the well-intentioned use of regulatory powers for these purposes in appropriate situations.

274. The current poor financial condition of Thames Water also provides a timely reminder as to why the consideration of financial resilience in the near and longer-term is a concern of all stakeholders, including companies, regulators and customers.

275. Nevertheless, it is also important that constraints placed on regulated companies that are intended to ensure that adequate levels of financial resilience are maintained, and that restrict their operation or ability to raise finance, are effective at addressing the cause of a lack of financial resilience and are proportionate within the range of suitable actions that could be taken. If proposed measures to tackle a lack of financial resilience do not meet these criteria, then this may lead to an increased risk of unnecessary cost or harm to stakeholders, and ultimately customers.

276. A mechanism that was introduced by Ofwat at PR19 with the intention of improving financial resilience by incentivising a reduction in gearing was the Gearing Outperformance Sharing Mechanism (GOSM)[149]. At its PR19 Redeterminations, the CMA found that 'the mechanism was not well-designed to increase the financial resilience of the Disputing Companies and might even reduce it, in the absence of any evidence of any relevant benefits that could be shared with customers. Also, we considered there was insufficient evidence that an intervention of this nature was required for the Disputing Companies within this price control.'[150] Without significant redesign or further investigation, we have a material concern that Ofwat's proposed options for additional protections for financial resilience for PR24 may also suffer from unacceptable shortcomings. We note that Ofwat has decided not to apply the GOSM mechanism as part of the PR19 reconciliation process or for the 2025-30 period[151].

4.2.3. Our concerns with the proposals

277. Firstly, it is not clear why Ofwat considers additional protections to be needed, as it has not provided evidence or concluded that levels of financial resilience are systemically inadequate. Nevertheless, we assume that Ofwat has (implicitly) concluded that levels of financial resilience are systemically inadequate for the purposes of the remainder of this section.

278. Secondly, if Ofwat has determined that levels of financial resilience are systemically inadequate, and this requires action, it is important to note that there are three main drivers of water companies' financial resilience:

[149] PR19 final determinations: Aligning risk and return technical appendix, p129-131
[150] CMA, PR19 Redeterminations Final Report, page 12.
[151] Ofwat DD, page 68.

- The regulatory regime, including allowances set by Ofwat, the distribution of risk and the extent to which cost and ODIs levels are achievable by an efficient company.
- Companies' actual operating and financing decisions, including whether and to what extent actual financial decisions deviate from the notional financing assumptions.
- External shocks.

279. When financial resilience is considered in the context of the above drivers, it is clear that it does not necessarily follow that inadequate financial resilience is the result of companies taking on too much financial risk, through their actual financing choices. Indeed, an alternative (albeit not mutually exclusive) explanation is that Ofwat's allowances are improperly calibrated. As set out in 4.1, a perceived lack of financial resilience is because of issues at the DD. The result is that the regime is not attractive to equity investors. This can be remedied by Ofwat correcting its assessment.

280. Thirdly, if Ofwat has determined that levels of financial resilience are systemically inadequate (which would require action), and it has determined with supporting evidence that companies' actual operating and financing decisions are the cause, then it must assess which factor driving companies' health is responsible for the lack of financial resilience. Ofwat has provided little evidence why gearing levels in excess of 70% are responsible for the perceived lack of financial resilience.

281. Fourthly, under the assumption that gearing levels in excess of 70% are responsible for the perceived lack of financial resilience, Ofwat focuses on remedies that restrict dividend distributions or affect their treatment. Ofwat presents no evidence of an assessment that its remedy is likely to be effective at improving financial resilience, or that its remedy is proportionate within the range of suitable actions that could be taken.

282. Any interventions to restrict companies' operation or their ability to raise finance should not be taken lightly. If an intervention is to be made. Such a decision should be based upon:

- Robust evidence that supports the existence of systemic lack of financial resilience and its cause that is a result of undesirable actual operating or financing decisions made by companies.
- Clear articulation of the net consumer detriment that Ofwat considers is arising as a result of the lack of financial resilience identified in this evidence.
- Identification of the full suite of potential remedies that would be effective at addressing the detriment identified.
- An assessment of the potential costs of the alternative remedies identified above, in particular the potential dampening effect on equity investment and the lost tax shield due to interest being tax deductible, which is passed on to consumers.

283. Ofwat should follow the assessment above before implementing the remedy that is the least onerous to achieve the aim of addressing any net consumer detriment identified from a lack of financial resilience.

284. Ofwat's current proposal in the DD of imposing dividend lock-ups (or RCV reductions) after 70% gearing does not meet any of the necessary steps above.

- Ofwat has not demonstrated that there is poor financial resilience across the sector nor that this is resulting in net detriment to consumers. Rather it presents stylized analysis that higher gearing increases the risk to equity.[152] This is hardly surprising and it is unclear how this stylized analysis demonstrates net harm to consumers from companies actual gearing being above Ofwat's notional gearing or why such an analysis supports a 70% gearing threshold specifically.
- Even if Ofwat were to demonstrate a sector-wide financial resilience concern that is leading to net consumer detriment, it should demonstrate that this isn't a result of its settlement being mis-calibrated.
- Ofwat has not identified the full suite of potential remedies that could be implemented to address the (as yet undemonstrated) net consumer detriment. Rather, Ofwat identifies two potential remedies that would restrict dividends where gearing exceeds 70% and a third remedy of making a downward adjustment to the RCV, again where gearing exceeds 70%.[153] Ofwat does not consider alternative remedial measures, including whether different gearing thresholds or a glide path would be appropriate. In this regard, we note that Ofgem is proposing a higher gearing threshold of 75%, based on covenants in actual firm's loan agreements and the proposed level being above the actual gearing of the energy networks to which it would apply.[154]
- Ofwat has not considered the dampening effect that its proposed measures would have on equity investment or the loss of the tax shield in its overall assessment. Both effects would lead to consumer harm should the remedy be implemented, as currently designed. Indeed, under our current financial structure, a dividend lock-up at 70% gearing would restrict dividends within AMP8, which is simply not a credible proposition for equity investors at a time when we need to raise substantial sums of new equity.

285. Ofwat should correct its proposed DD, before re-assessing whether there is indeed a financial resilience issue across the sector and in turn whether there is any net consumer harm to address. If Ofwat demonstrates that there is net consumer harm to address, then the full suite of potential remedies should be identified and a robust cost benefit analysis of each should be undertaken.

4.2.4. The method of implementation of additional protections

286. Within Ofwat's options for its additional protections, Ofwat proposes separate methods for the implementation of its mechanisms of restricting dividend distributions (or imposing RCV deductions) where gearing levels exceed 70%. The proposed methods of implementation are via an amendment to Ofwat's dividend guidance, an

[152] Ofwat DD, Allowed Return Appendix, Figure 11.
[153] Ofwat DD, Allowed Return Appendix, page 69.
[154] Ofgem RIIO-3, Sector Specific Methodology Decision, Finance Annex, para 6.25.

amendment to the licences of all companies or only to those companies where Ofwat has identified actions that are required to address weak levels of financial resilience, or at a subsequent price review.

287. Ofwat's 'Guidance on factors Ofwat considers in assessing dividends declared or paid'[155] sets out the factors Ofwat expects to consider in assessing companies' compliance with the dividend policy licence condition. It is intended to ensure that dividends declared or paid are in accordance with a dividend policy that aligns with the principle that such dividends take account of service delivery for customers and the environment over time, including performance levels, and other obligations, as required by companies' licence conditions. Ofwat's proposal to implement a restriction on dividend distributions where gearing levels exceed 70%, would not be a measure to ensure that dividends paid take account of service delivery or performance levels. Therefore, Ofwat's proposal to restrict dividends on the basis of an unsupported gearing threshold would not be an appropriate use of its enforcement powers in this respect.

288. Price reviews can be an intense period requiring considerable efforts from companies and Ofwat on a wide range of topics in order to reach a regulatory settlement that is appropriate. We suggest that the introduction of a significant novel mechanism to treat dividend distributions as a reduction of value attracting an RCV deduction may not receive the attention that is due to reach the best outcomes, if a mechanism to improve financial resilience via the restriction of dividends is required.

289. If a mechanism to improve financial resilience via the restriction of dividends where gearing levels are in excess of 70% is required, then a further revision to the ring-fencing licence conditions of companies with weak levels of financial resilience would be most suitable within the set of three options presented.

4.3. FINANCEABILITY

4.3.1. Ofwat's approach to financeability

290. Ofwat interprets its financing duty as 'a duty to secure that an efficient company with the notional capital structure can finance its functions, in particular by securing reasonable returns on its capital'[156]. Accordingly, Ofwat's conducts a financeability assessment, which considers whether an efficient company with the notional capital structure will be able to generate cashflows that are sufficient to meet its financing needs. As part of its assessment, Ofwat analyses key financial ratios under its settlement for a company with the notional capital structure, reviews cost recovery rates proposed in business plans to ensure these are reasonable, and requires companies to provide board assurance that business plans are financeable under the notional capital structure.[157]

[155] Ofwat, 'IN 23/04 Guidance on factors Ofwat considers in assessing dividends declared or paid' (June 2023), https://www.ofwat.gov.uk/wp-content/uploads/2023/05/Information-notice-–-guidance-on-factors-Ofwat-considers-in-assessing-dividends-declared-or-paid.pdf
[156] Ofwat DD, Aligning risk and return appendix, page 48
[157] Ofwat DD, Aligning Risk and Return Appendix, page 48

291. Ofwat's approach to its financeability assessment assumes that RCV growth from the 2025-30 investment programme is initially funded by debt. To satisfy financeability constraints under increased levels of gearing and declining cash interest and debt coverage financial ratios, Ofwat applies equity-based solutions, firstly in the form of higher retained earnings by lowering the dividend yield from 4% to a minimum of 2%, then with new equity issuance, if necessary[158]. For all companies, Ofwat finds that the level of RCV growth will require both equity and debt finance on a notional basis to meet financeability constraints[159]. Ofwat considers that the targeted interventions it has made to setting the allowed return and to the risk and return package support companies to raise the equity required. Therefore, after accounting for the provision of new equity to support the investment programme, Ofwat finds that the financial metrics calculated are consistent with its target credit rating and will enable the efficient company to raise the finance it needs on reasonable terms[160].

4.3.2. Our assessment of financeability

292. We have undertaken a financeability assessment under the regulatory settlement specified in Ofwat's DD for an efficient company with the notional capital structure, on the basis of assumptions proposed by Ofwat for an efficient level of costs (including the cost of capital) and service performance levels. The results of our analysis, which are set out in Figure 17 below, are consistent with Ofwat's findings in its DD in so far as the notional company requires a lowering of the dividend yield to 2% and a £463m equity injection over the AMP for its financial metrics to be consistent with its target credit rating.

FIGURE 17 - KEY FINANCEABILITY METRICS COMPARED TO INVESTMENT GRADE THRESHOLD FOR NOTIONAL CO. ASSUMING OFWAT'S WACC, 2% DIVIDEND YIELD AND £400M EQUITY INJECTION

Metric	25/26	26/27	27/28	28/29	29/30	Average	Baa1/BBB+ Threshold
Adjusted cash interest cover (Moody's)	1.28	1.64	1.72	1.78	1.82	1.67	>1.5x
Funds from operations/net debt (S&P)	8.13%	9.18%	9.03%	9.16%	9.27%	8.98%	>9%
Gearing	57.48%	55.69%	57.24%	55.37%	55.99%	56.31%	<72%
PMICR (Fitch) Cash	1.20	1.57	1.66	1.72	1.76	1.58	>1.4x
PMICR (Fitch) Nominal	1.44	1.91	1.95	2.07	1.93	1.86	>1.7x
Equity injection £m	-	256	-	208	-	463	Total
Dividends £m	54	65	65	75	75	67	
Dividends %	2.0%	2.0%	2.0%	2.1%	2.1%	2.1%	

Source: Our analysis of Ofwat's DD

[158] Ofwat DD, Aligning Risk and Return Appendix, page 51
[159] Ofwat DD, Aligning Risk and Return Appendix, page 53
[160] Ibid.

293. The analysis shown in Figure 17 demonstrates that notional financeability relies on: i) being able to raise substantial sums of new equity over the AMP, and ii) equity investors being satisfied with a 2% dividend yield. Ofwat's DD is therefore financeable only if the allowed return on equity is commensurate with the rate of return that is required by investors, given the risk facing equity investors under Ofwat's DD, and investors are willing to accept a payoff profile provided by a 2% dividend yield when making an investment in regulated water assets. Taking each point in turn:

- For the reasons set out in section 3.3, Ofwat's approach to setting the allowed return on equity materially understates the rate of return that is required by equity investors, contributing to an allowance for the cost of equity that is insufficient. So, Ofwat's DD is not an attractive proposition to equity investors.
- We understand the well-known theoretical result that in a perfect market without taxes, transaction costs, or asymmetric information, the value of a firm is unaffected by its dividend policy, all else equal. However, in practice, market frictions such as taxes, transaction costs, or asymmetric information are present, and certain sets of investors are likely to prefer different payoff profiles according to factors such as their income preferences, tax situation, and funding arrangements of their own. Long-term investors that value the future success of the water sector and recognise its importance for stakeholders more broadly may prefer predictable, reliable dividend streams. These points and a summary of relevant academic studies that point to the tendency of different investors to prefer different dividend policies are discussed in a report for Water UK[161]. As a result, Ofwat cannot be confident that long-term investors in water assets will continue to invest in an efficient company with the notional capital structure if its dividend yield is cut to 2%.

294. Since the allowed return on equity is insufficient to remunerate equity investors for the level of risk they face from an investment in water assets, and long-term investors are unlikely to continue to provide investment in water companies unquestioningly with significant reductions in dividend payouts even if the allowed return on equity were sufficient, it would not be rational for investors to inject the required equity on which Ofwat's financeability assessment relies. Therefore, Ofwat incorrectly concludes that an efficient company with the notional capital structure is able to raise the finance it requires on reasonable terms. Accordingly, Ofwat is likely to be in breach of its financeability duty, if its DD were to be implemented for PR24.

295. Under the regulatory settlement specified in Ofwat's DD and on the basis of our assessment of an efficient level of costs (including the cost of capital) and service performance levels, an efficient company with the notional capital structure will be able to satisfy financeability constraints of target thresholds under relevant financial ratios by raising a substantial amount of new equity, only if Ofwat makes the following necessary corrections to the allowed return and risk in the regulatory settlement:

[161] Oxera for Water UK, 'Investability at PR24' (August 2024)

- Corrects its unfunded true-up mechanisms for business rates allowances (section 7.1.1), the energy cost adjustment (section 7.1.9) and 'gated' capex (section 7.3.4) which create in-period cash shortfalls from the underestimation of forecast costs, requiring additional financing and generating additional financing costs for the notional company.
- Addresses expected losses facing the notional company from cost allowances, due to an overly ambitious rate of improvement under Ofwat's proposal for frontier shift that is inconsistent with expected rates of productivity improvement in the economy (see section 7.1.7), and an underestimation of expected costs related to Business Rates (see section 7.1.1).
- Addresses expected losses and mitigates the risk facing the notional company from volatile chemical prices by implementing an RPE true-up mechanism for chemical costs (see section 7.1.8).
- Implements targeted amendments to the package of ODIs to reduce the downside skew in returns and remove expected losses (see section 8.1), including restoring deadbands for asymmetric performance commitments, mitigating the downside skew for C-Mex, reconsidering the level of baseline performance against several measures in the package (including PCC, interruptions to supply, and pollutions), and reconsidering the inclusion of growth assumptions in the non-household demand performance commitments;
- Sets an allowed return on equity and debt for the notional company that is commensurate with the rate of return that is required by investors (see section 3.3 and 3.4); and
- Sets a benchmark dividend yield that is considerably in excess of 2% for an efficient company with the notional capital structure.

4.4. OUR UPDATED FINANCIAL RESILIENCE ASSESSMENT

296. Ofwat has asked us to provide board assurance and supporting evidence to confirm and explain how they have assessed that they will maintain adequate levels of financial resilience in 2025-30, and how they have updated their assessments in response to the DD.

297. We consider financial resilience to be having sufficient financial safeguards or headroom, so that we can avoid and/or manage the risk of financial distress or failure if there is a downside shock. As part of our business plan submission, Ofwat sought additional board assurance from us on our ability to remain financially resilient over PR24 and beyond.

298. In respect of financeability for an efficient company with the notional capital structure, which is set out in section 1 above, we find that, even under assumptions proposed by Ofwat for an efficient level of costs and service performance levels, a sizeable £463m equity injection over the AMP is required for relevant financial metrics to be consistent with the target credit rating. The allowed return on equity is insufficient to remunerate equity investors for the level of risk they face form an investment in water assets, and Ofwat cannot be confident that long-term investors in water assets will continue to invest in an efficient company with the notional capital structure if its dividend yield is cut, even if the allowed return on equity were sufficient. Therefore, it would not be

rational for investors to inject the required equity on which Ofwat's financeability assessment relies. Under the regulatory settlement specified in Ofwat's DD and on the basis of our assessment of an efficient level of costs (including the cost of capital) and service performance levels, an efficient company with the notional capital structure will be able to satisfy financeability constraints of target thresholds under relevant financial ratios by raising a substantial amount of new equity, only if Ofwat makes the corrections necessary to the allowed return and risk in the regulatory settlement (see section 4.1.2).

299. We have determined how we will maintain adequate levels of financial resilience in 2025-30 by undertaking a similar analysis of whether key financial ratios under our actual capital structure meet relevant thresholds for target ratings on the basis of the regulatory settlement and assumptions proposed by Ofwat in its DD for an efficient level of costs and service performance levels. We have also conducted headroom tests by investigating whether the same financial ratios under our actual capital structure continue to meet relevant thresholds for target downside ratings on the basis of the regulatory settlement and assumptions proposed by Ofwat in its DD in stressed scenarios, and considering the additional expenditure that we could withstand and maintain an adjusted interest cover ratio of one.

300. Our assessment of financial resilience, which uses our actual capital structure, finds that we are likely to be able to maintain adequate levels of financial resilience under the regulatory settlement and assumptions proposed by Ofwat in its DD for an efficient level of costs and service performance levels in a base case scenario, if c.£400m of new equity is injected, and the target financial ratios for the actual company fall to thresholds that are consistent with a Baa2/BBB rating.

301. As with financeability of the notional company, our assessment of financial resilience relies on raising a sizeable level of new equity. For the reasons set out in section 3.3, Ofwat's approach to setting the allowed return on equity materially understates the rate of return that is required by equity investors, contributing to an allowance for the cost of equity that is insufficient. In addition, Ofwat cannot be confident that long-term investors in water assets will continue to invest in an efficient company if the benchmark dividend yield is cut, even if the allowed return on equity were sufficient. Therefore, it would not be rational for investors to inject the required equity, meaning that we are unlikely to be able to maintain adequate levels of financial resilience in 2025-30 on the basis of the regulatory settlement proposed by Ofwat in its DD.

302. Furthermore, notwithstanding our concerns with Ofwat's additional financial resilience mitigations, which we address in paragraph 303 below, the proposed mitigations apply to firms with gearing levels above 70%. This would include Northumbrian Water under our current capital structure. We would therefore have to raise further equity in addition to that required to maintain relevant financial ratios above target thresholds, so that we could preserve a dividend stream that is required by its investors. Ofwat's additional financial resilience mitigations therefore exacerbate equity uninvestability and the existing financeability and financial resilience issues under the DD.

303. On the basis of the regulatory settlement proposed by Ofwat in its DD, it is likely that we only will be able to maintain adequate levels of financial resilience in 2025-30 by injecting a substantial amount of new equity and lowering target rating thresholds for the actual company to Baa2/BBB level if Ofwat:

- Corrects its unfunded true-up mechanisms for Business Rates allowances (see 7.1.1), the energy cost adjustment (see 7.1.9) and 'gated' totex (see 7.3.4) proposals. These create in-period cash shortfalls from the underestimation of forecast costs, requiring additional financing and generating additional financing costs for the notional company.
- Addresses expected losses facing the notional company from cost allowances, due to an overly ambitious rate of improvement under Ofwat's proposal for Frontier Shift that is inconsistent with expected rates of productivity improvement in the economy (see section 7.1.7), and an underestimation of expected costs related to Business Rates (see section 7.1.1).
- Addresses expected losses and mitigates the risk facing the notional company from volatile chemical prices by implementing an RPE true-up mechanism for chemical costs (see section 7.1.8).
- Implements targeted amendments to the package of ODIs to reduce the downside skew in returns and remove expected losses (see section 8.1), including restoring deadbands for asymmetric performance commitments, mitigating the downside skew for C-Mex, reconsidering the level of baseline performance against several measures in the package (including PCC, interruptions to supply, and pollutions), and reconsidering the inclusion of growth assumptions in the non-household demand performance commitments.
- Sets an allowed return on equity and debt for the notional company that is commensurate with the rate of return that is required by investors (see sections 3.3 and 3.4).
- Sets a benchmark dividend yield that is considerably in excess of 2% for an efficient company with the notional capital structure (see section 4.3).
- Reconsiders its proposed 'additional protections' that block dividends or reduce the RCV, when gearing of the actual company exceeds 70%.

304. Notwithstanding our concerns with Ofwat's additional protections, lowering actual gearing to a level beneath 70% according to a 'glide path' to maintain adequate levels of financial resilience in 2025-30 may ease short-term pressure to raise equity. However, additional equity injections in the medium term would still be required, and therefore continue to hinge on Ofwat correctly calibrating the allowed return on equity and setting an appropriate benchmark dividend yield for an efficient company with the notional capital structure.

5. ASSET HEALTH

305. As we described in the Executive Summary, we are deeply concerned that Ofwat has ruled out investments in asset health and climate change resilience that we – and our customers – considered critical for 2025-30. These are critical to ensure the resilience of our systems in the long term, and we have provided evidence to show that delaying these investments will mean increased costs in the future as well as more disruption in the short term. We discussed these in depth with customers in our engagement, who said that they wanted to invest in this now rather than delaying these investments, and Ofwat has not acknowledged or considered this evidence in making these decisions. The need to improve asset health and resilience in the light of changing external pressures should not be ignored.

306. We respond to Ofwat's DD below on asset health (section 5) and climate change adaptation (section 1). In some areas, we have provided more evidence to support our case.

307. We are particularly concerned because Ofwat has not engaged with us on these topics before the Draft Determination – some nine months since we provided them with our business plan, and more than twelve months after we provided them with our detailed evidence on asset health. In the meantime, we could have provided the evidence that Ofwat says is missing, or addressed some of the points that Ofwat is concerned about. It is clearly not sensible to leave this to a seven-week consultation after nine months of assessment - this is not adequate or reasonable consultation.

5.1. OVERVIEW

308. We welcome the adjustment that the DD makes for mains renewal, as this is a positive step.

309. However, we are disappointed with the overall approach taken in the DD towards asset health. Water mains only form a third of our water asset base by value and there are other key assets requiring interventions for which we do not think the current base expenditure allowances are sufficient.

310. We are strongly of the view that backward looking analysis will no longer meet the future need, and that the base cost models which have previously been used require adjustment to take into account that neither the present nor the future will look like the past. We have raised these concerns in our business plan and in the earlier engagement period. Other water companies and interested stakeholders have raised similar concerns. Ofwat should consider these issues further.

311. The evidence that we presented in the business case on the need for increased future investment does not appear to have been engaged with in any meaningful way. For example, we received no queries at all about the information presented on the shortfall in funding or on our civils case.

312. Ofwat says that it has increased base funding by £6.8 billion from PR19 and that this is 14% higher than PR19 - and 3% more than companies have spent in the last 5 years. Ofwat also goes on to say that capital maintenance expenditure has increased by 9% in real terms since 2011-12.

313. These figures are not consistent with the narrative in the DD, where Ofwat sets out that it expects "companies to use this increased expenditure to maintain and improve the health of their asset base and to deliver improved asset health taking into account the impact of climate change in the 2025- 30 period".[162] These increases in base funding are also not consistent with the view put across in our business case that investment (and funding) levels have not been sufficient to maintain the long-term health of the asset base for the following reasons:

- Between 2011/12 and 2022/23 the RCV of water companies has increased by 22% in real terms, so a 9% increase in capital maintenance has not kept pace with the needs of the network. The 14% increase in base totex for PR24 is driven by the other factors set out by Ofwat (growth in cost drivers, higher input prices, increased requirements). The uplifts for mains renewal and replacing water meters are relatively small components of this increase.
- Similarly, if base totex has increased by 14% since PR19 but capital maintenance has only increased by 9% since 2011/12 then this points towards a diminishing share of capital maintenance spend within base totex. This again suggests that capital maintenance is being squeezed in the context of cost pressures affecting base expenditure.

314. Given the points above and the evidence in our case we do not see how companies can be expected to maintain asset health and then to improve it too - while taking account of the impacts of climate change, which will increase the challenge further.

315. In the sections below, we respond to the DD on our civil assets enhancement case (section 5.2) and on mains renewal (section 5.3). We also make an alternative proposal that we think would address our concerns and protect customers' interests (section 5.4).

316. We asked our customers what they thought we should do in response to Ofwat's DD (see NES82). Customers had mixed views on this, though panellists in the online session were broadly in agreement that Ofwat's view should be challenged. Some felt that Ofwat should not ignore how customer views helped shape the business plan – that is, if customers felt that a middle ground investment in asset health was both necessary and fair, then Ofwat should agree with this decision[163]. Other customers felt that Ofwat's decision should be trusted as they, as the industry regulator, could make impartial and evidence-based decisions regarding the level of investment required[164].

[162] PR24-draft-determinations-Expenditure-allowances-to-upload.pdf (ofwat.gov.uk), page 3
[163] NES82, p33
[164] NES82, p34

5.2. CIVIL ASSETS ENHANCEMENT CASE

317. The "PR24-DD-NES_Cost-adjustment-claims.xlsx" model sets out a series of concerns over our case which we respond to in turn using the same structure and headings as the DD model. Since the water and wastewater cases were jointly assessed, we also cover them jointly.

5.2.1. Unique Circumstances

318. Ofwat is correct that we did not argue that there were unique circumstances. Instead, our position is that:

- The historical level of funding provided by the models is not sufficient in the long run to adequately replace assets when they reach the end of their lives. This is demonstrated by the evidence presented in section 3.3 of **NES35**. Ofwat does not appear to engage with this material at all in the DD and has not done so in a query either.
- Consistent with the point above, we have provided evidence in our business case for our civils assets that our future need for investment is higher than what we have spent historically due to the age profile of these assets. Consequentially, our investment needs from base are higher than what is funded through an implicit allowance.

319. We only have data for Northumbrian Water to demonstrate this point, but this does not mean that our request should be overlooked without reasonable justification. We note that we originally intended to submit our case as an 'enhancement' case and not a 'cost adjustment claim' for this very reason - it is not a case about our different circumstances.

320. We set out this point in our email to Ofwat about early submission of the cost adjustment claims.[165] Ofwat cannot reasonably use its regulatory framework design as a reason to exclude efficient investment from companies.

5.2.2. Management control

321. In this section, Ofwat says:

> "Capital maintenance expenditure is under company control. We provide a long-term efficient base expenditure allowance for companies to manage capital maintenance requirements across large, diverse asset bases. Consequently, in some years companies will spend more on some assets and less on others. We expect companies to manage the peaks and troughs over time and between programmes through base allowances. We have seen evidence of companies overspending in the current regulatory

[165] Email from Northumbrian Water to the Ofwat Cost Assessment team, 4 July 2023.

period to improve asset health at water and sewage treatment works in annual performance report commentary."

322. Ofwat says that it provides a "long-term efficient base expenditure allowance" but does not demonstrate why its level of funding that relies on backward looking information would achieve this. We provided evidence in our business case that this was not the case in practice, and that an increase in future funding is required. For example, we set out:

- Our historical levels of capital maintenance expenditure are not close to the levels implied by the lives of the asset base we manage. In 2021/22, we completed work with the Water Industry Commission for Scotland (WICS) and Scottish Water examining the current replacement rates of different asset groups against the expected replacement rates based on the economic lives of those assets. This work suggested that we are currently maintaining and replacing assets at a materially lower rate than is implied by the lives of those assets.
- Over the last five price control periods, the sector will on average have spent its total expenditure allowances in full by 2025. The sector will also have spent its capital maintenance allowances in full for those price control periods when such allowances were separately defined (PR99-PR09). This is also true for Northumbrian Water - in aggregate since 2000, we have overspent our capital maintenance allowances after cost sharing.
- We see a steady growth in levels of reactive maintenance expenditure over time as the assets deteriorate and lower investment levels in areas of the asset base which are less critical to service delivery to customers or where asset lives are longer. Proactive asset management is more efficient than reactive.
- Further analysis carried out for Water UK has confirmed many of the same concerns[166] and highlights the low renewal rates of some assets compared to international comparators and the declining depreciation rates across the sector.

323. The CMA noted that "issues with capital maintenance may be forward looking" [167] and it also suggested that "Ofwat considers developing indicators to track this issue and to enable it to enhance its analysis with a forward-looking element that will assist in triangulating results from its econometric modelling of historic costs". The evidence we have provided is forward looking and not simply an issue of peaks and troughs over time. Figure 26 of our Asset Health case shows that the issues facing our civil structures are not just an increase for AMP8 but will continue to 2050 and beyond as increasing numbers of structures deteriorate further. We ask that Ofwat reconsider this issue.

324. In AMP7, we expect to overspend our capital maintenance allowances by £33m. We have updated the table from our business case to show our spend on capital maintenance shown below.

[166] Economic Insight, 2022, Options for a sustainable approach to asset maintenance and replacement
[167] Final report (publishing.service.gov.uk), paragraph 4.239

FIGURE 18 - OUR HISTORICAL ACTUAL EXPENDITURE AGAINST CAPITAL MAINTENANCE ALLOWANCES (AMP 3-5) AND IMPLICIT ALLOWANCES (AMP 6-7) (17-18 PRICES, £M)

	AMP3	AMP4	AMP5	AMP6	AMP7	Total
Period	**2000-05**	**2005-10**	**2010-15**	**2015-20**	**2020-25**	**2000-25**
FD						
Water	458	428	583	537	599	2604
Wastewater	253	304	451	302	404	1714
Total	**711**	**731**	**1034**	**839**	**1003**	**4318**
Actual						
Water	443	471	468	547	657	2586
Wastewater	264	411	346	328	379	1729
Total	**707**	**882**	**814**	**875**	**1036**	**4315**
Overspend: Actual-FD						
Water	-15	44	-115	10	58	-18
Wastewater	11	107	-105	26	-25	15
Total	**-4**	**151**	**-220**	**36**	**33**	**-3**
Company share	**100%**	**100%**	**30%**	**50%**	**55%**	**-**
Company share						
Water	-15	44	-34	5	32	31
Wastewater	11	107	-32	13	-11	89
Total	**-4**	**151**	**-66**	**18**	**21**	**120**

Source: Northumbrian Water analysis of historical June Return and APR data and PR99, 04, 09, 14 and 19 FD information from Ofwat

325. This demonstrates that going back to 2000:

- We have spent our capital maintenance allowances in full (a £3m underspend is 0.07% of our allowances over the period and therefore negligible)
- After cost sharing, we have overspent what we have recovered from customers by £120m.

326. We are therefore not seeking allowances to make up for past underinvestment below the allowances provided by price reviews. The relevant question here is about appropriate allowances for AMP8 and we are keen that Ofwat engages on that topic. It is not a reasonable solution to suggest that we should have overspent by more in the past.

5.2.3. Materiality

327. Ofwat states that the "wholesale water non-infra capital maintenance cost adjustment claim is not material." The business case was for £17.8m – we do not consider this to be an immaterial amount. It is also a sum greater than 24 of our enhancement lines which have been funded. A £17.8m enhancement would also be too large to meet the criteria for a shallow dive under the PR24 methodology again showing it is not immaterial in Ofwat's eyes. The

use of a materiality threshold in this area appears to be a tool in a regulatory framework to unreasonably exclude investment that would not be considered immaterial if it were instead assessed under a different part of the methodology.

328. Moreover, given the fact that Ofwat provided the same narrative in response to both our water and wastewater civils cases, it has clearly assessed them jointly given the common evidence. Combined these cases total £112m, which we do not think can be considered immaterial, and we see no reason why the adjustment would not apply to both elements.

329. If Ofwat had considered this investment material, the rest of the feedback they give on their deep dive assessment shows that they would have accepted at least part of the costs for this claim.

5.2.4. Adjustment to allowances

330. Ofwat states that:

> "Capital maintenance to maintain asset health is included in base allowances. It is the company's duty to maintain asset health, and replacement of long life assets at the optimal time is part of this. We expect companies to carry out these works using their base allowances."

331. We agree that companies need to maintain asset health from base allowances. However, this is a responsibility we share with Ofwat – we are responsible for carrying out effective asset management, but Ofwat has responsibility for ensuring that the regulatory framework provides a suitable level of capital maintenance funding to discharge this effectively. As summarised in paragraph 322 above, we and others have provided evidence that the current level of funding is not sufficient to meet future requirements because historical levels of capital maintenance are below levels implied by asset lives - and we and the sector are spending our capital maintenance budgets, on average. It is for these reasons that we are requesting an uplift to deliver our forward-looking requirements.

332. For both our water and wastewater cases, Ofwat states that

> "Northumbrian Water implies in its business case that the lack of proactive asset condition survey is the root cause of increased reactive capital maintenance expenditure, which in our view is within company control." and

> "Northumbrian Water argues that a lack of proactive capital maintenance is driving an increase in reactive capital maintenance, which is within company control."

333. This is not a fair interpretation of our case. Consistent with our points above, our argument focuses on the fact that capital maintenance allowances are below the long-run efficient level and need to be increased in future. A consequence of this, even for a company that has spent its allowances going back to 2000, is that there is

reduced scope for proactive interventions within the cost envelope provided by the settlement and instead reactive maintenance has increased. This is within our control, but the setting of the capital maintenance budget is not. This is why we are seeking to engage Ofwat on an adjustment for these assets where the past is not a good guide to the future maintenance requirements.

334. For the water case, Ofwat states that:

> "Northumbrian Water is currently not performing well against the compliance risk index. As stated in our PR24 methodology, companies are funded to be compliant with their current legal obligations through base expenditure allowances. Any non-compliance should be addressed by companies, and we do not expect customers to pay for this."

335. We strongly reject Ofwat's conclusion in this area. Our driver for these investments and the funding request is not driven by our CRI performance. As set out in our case, due to the age of our concrete structures we now face much higher investment requirements for these assets than we have done historically as they have not required interventions of this volume in the past.

336. The majority of the CRI performance issues we experience are due to failures at WTWs. The purpose of the business case is not to seek to prevent the CRI failures that are occurring at WTW. The majority of these are microbiological failures that are associated with ingress on final water storage tanks. Of the AMP7 WTW failures, 18 are microbiological and 6 are turbidity, making 24 failures in the 2020-2023 period. By contrast the focus of the asset health business case is to repair clarifiers, inlet works and filter block civil structures. Final water storage tanks to prevent ingress are not part of the programme of civils covered by this case. We have agreed a programme of work with the DWI to address these issues and it does not relate to this part of the asset health case. Most of the investment covered by the case relates to wastewater expenditure (84%), which is not relevant to CRI.

337. Similarly, our supplementary business case for service reservoirs does not seek to ask customers to pay for an improvement in CRI – as stated, the majority of CRI non-compliance is not due to the service reservoir element of our CRI scores. For clarity, we include a breakdown of our CRI scores.

FIGURE 19 - CRI BREAKDOWN

	2017	2018	2019	2020	2021	2022	2023	Average
Service Reservoirs	0.054	0.117	0.467	0.056	0.171	0.206	0.205	0.18
Water treatment	1.195	0.987	0.485	5.022	4.398	4.818	0.038	2.62
Zone	1.164	1.157	1.987	1.621	1.804	1.208	2.282	1.68
Supply point	0.000	0.000	0.267	0.415	0.000	1.316	0.603	0.43
Total CRI		**2.261**	**3.205**	**7.114**	**6.373**	**7.548**	**3.128**	

Source: Northumbrian Water analysis

338. For our wastewater case, Ofwat states that:

> "Northumbrian Water provides no evidence of a clear link between the claim and any exogeneous factors that are driving the forecast increase in sewage treatment capital maintenance spend."

339. As set out above, our case is about the forward-looking expenditure requirements being higher than allowances based on historical costs. This is partly because historical allowances have not been sufficient; and partly because this has led to the deterioration of civils assets that historically have needed much lower maintenance requirements due to their age profile.

340. Ofwat then says:

> "Northumbrian Water does not demonstrate efficient use of base expenditure allowances in previous periods, and has notably spent much less than other wastewater companies on sewage treatment capital maintenance in the historical period. We therefore have concerns that this claim reflects under-delivery of non-infra capital maintenance in previous periods, which would lead to customers paying twice if we allowed it."

341. Ofwat goes on to say:

> "Similarly, Northumbrian Water calculated the implicit allowance based on its own historical cost, which will underestimate the implicit allowance given that it has spent significantly less than other wastewater companies on non-infra capital maintenance over the 2011-12 to 2022-23 period. Our analysis suggests the claim is unlikely to be material if non-infra capital maintenance expenditure from other companies was used to calculate the implicit allowance. For example, we calculate that Northumbrian Water would have spent an additional £110 million on wastewater non-infra capital maintenance over the 2011-12 to 2022-23 period if it had invested in asset health at the same level as the median company (based on capital maintenance spend per property)."

342. We asked Ofwat for its calculations to arrive at this £110m, as this is the most important analysis for the wastewater asset health case (where there are no questions about materiality or impact on performance commitments). We know that if we had spent less than our base allowances in the past, then customers should not pay twice for this.

343. However, we were surprised at Ofwat's stated findings because we have spent our capital maintenance allowances for wastewater going back to 2000[168]. In our asset health enhancement case (NES35), we estimated the amount that should be removed because this was already implied by base models and removed this. So, we did not think we had any historical deficit to customers that should be paid back – much less £110m.

344. Ofwat shared its calculation in response to our query during the DD consultation process. This used a "unit cost" model to compare the sewage treatment cost per property across companies. This showed that we spent, on average, £7 per property less than the median company across the period 2011-12 to 2022-23. This leads to an average £9m per year less, for a total of £110m.

345. However, this "unit cost" model is not a sensible comparison. Ofwat knows this, because it assesses the efficient costs each company should be allowed each year for sewage treatment in its base models. In doing this, Ofwat does not use a simple unit cost model because it does not consider this to be a robust approach – instead, it uses a weighted average of two econometric models (SWT1 and SWT2) to estimate these costs for each company. Ofwat does this because it is a better comparison of efficient costs to provide sewage treatment than a simple unit cost model – and so this should be used here too.

346. We calculated the allowance that Ofwat's base models (as used for PR24 draft determinations) would calculate, and then divided these by the number of properties – to derive a "cost per property" allowance for sewage treatment under Ofwat's models. This shows that our allowed costs for sewage treatment are around £10 per property *less* than the median (see Figure 20).

[168] See Figure 4 in this document, replicated from our enhancement case NES35

FIGURE 20: COMPARISON OF MODELLED UNIT COSTS (PER CONNECTED PROPERTY) FOR SEWAGE TREATMENT IN 2022/23 (£, 2022/23 PRICES)

Company	Predicted costs per property in 2022/23
ANH	70.83
NES	60.08
NWT	68.31
SRN	69.19
SVH	60.06
SWB	96.18
TMS	61.52
WSH	72.11
WSX	74.17
YKY	72.62
Median	70.01

Source: Northumbrian Water analysis of the DD model "Base costs – wastewater model 3 (Network Plus)"

347. This shows that even under Ofwat's own models for sewage treatment it expects unit costs per property to be much lower for Northumbrian Water (£60 per property) that the sector median (£70 per property).

348. Next, we can repeat Ofwat's historical analysis – by projecting this back to 2011-12, as Ofwat does in their analysis, and comparing to the sector median minus £10. When compared to our actual expenditure in Ofwat's spreadsheet, this shows that we actually spent £10m *more* than the median during the period 2011-12 to 2022-23. On a unit cost basis, Ofwat's models show that we are funded less than the median and we would be considered inefficient if we did spend at this level – it should therefore not be a surprise that we have spent less than the median.

349. Secondly, Ofwat's comparison only goes back to 2011/12 and it benchmarks against median expenditure rather than our allowances. Figure 18 makes a proper comparison against allowances and goes back to 2000. This shows that we overspent our AMP4 allowances for capital maintenance by £107m (2017/18 prices) which shows that a longer-term view is needed to see the full picture.

350. Finally, the points above mean there is no basis to assume that our estimate of the implicit allowance is underestimated as we have shown that Ofwat's models expect us to spend less and we are funded less than other companies on the per property basis, and we have spent our allowances for capital maintenance going back to 2000. So there can be no suggestion we should have spent more.

5.2.5. Is there compelling evidence that cost estimates are efficient?

351. As part of the assessment, Ofwat states that:

> "But it is not clear how directly the outcome of the benchmarking analysis was used to produce the requested cost allowance. The company also provides insufficient evidence on how directly comparable

> the projects included in the cross-sector benchmarking exercise are to the schemes included in the claim."

352. We seek to clarify each of these points below.

353. The role of the benchmarking we undertook was two-fold:

- We used this as a sense check of our own costing curves. If these benchmarks showed our costs to be high then we would have investigated further the validity of our cost curves and decided whether we should lower our estimate of costs in light of this. In this case, our benchmarking showed that our costs were below the benchmark, so no adjustment to our cost estimates was required.
- It provided transparency for Ofwat and our customers on the efficiency of our costs.

5.2.6. Does the company provide third party assurance for robustness of the cost estimates?

354. Within its assessment, Ofwat says:

> Northumbrian Water commissioned a technical partner to work with to develop this claim. This included a cost benchmarking exercise to determine how efficient its costs were. However, there is no evidence of a third party assurance statement that signs off these costs.

355. We believe that our original case included a sensible third-party challenge to our costs and as robust a benchmarking approach as is possible in the circumstances but we have sought further third party assurance in response to Ofwat's feedback. We provide this report, including a third party assurance statement, as document NES80B.

5.3. MAINS RENEWAL

356. We are pleased that Ofwat has recognised the need for an uplift in main renewal rates as the asset lives implied by current rates are not sustainable. We also agree that it is an industry-wide issue and that a sector-wide adjustment is the appropriate route to address it.

357. Concerning the adjustment itself there are two elements that we think Ofwat should reconsider:

- The time period it considers for the renewal rate funded from base allowances.
- The exclusive focus on category 4 and 5 mains.

358. We discuss each of these issues in turn below. We have made a small change to the profile of our mains renewal programme, with a slightly slower start to reflect the increase to this and the inclusion of our Tees main projects in the early part of the AMP.

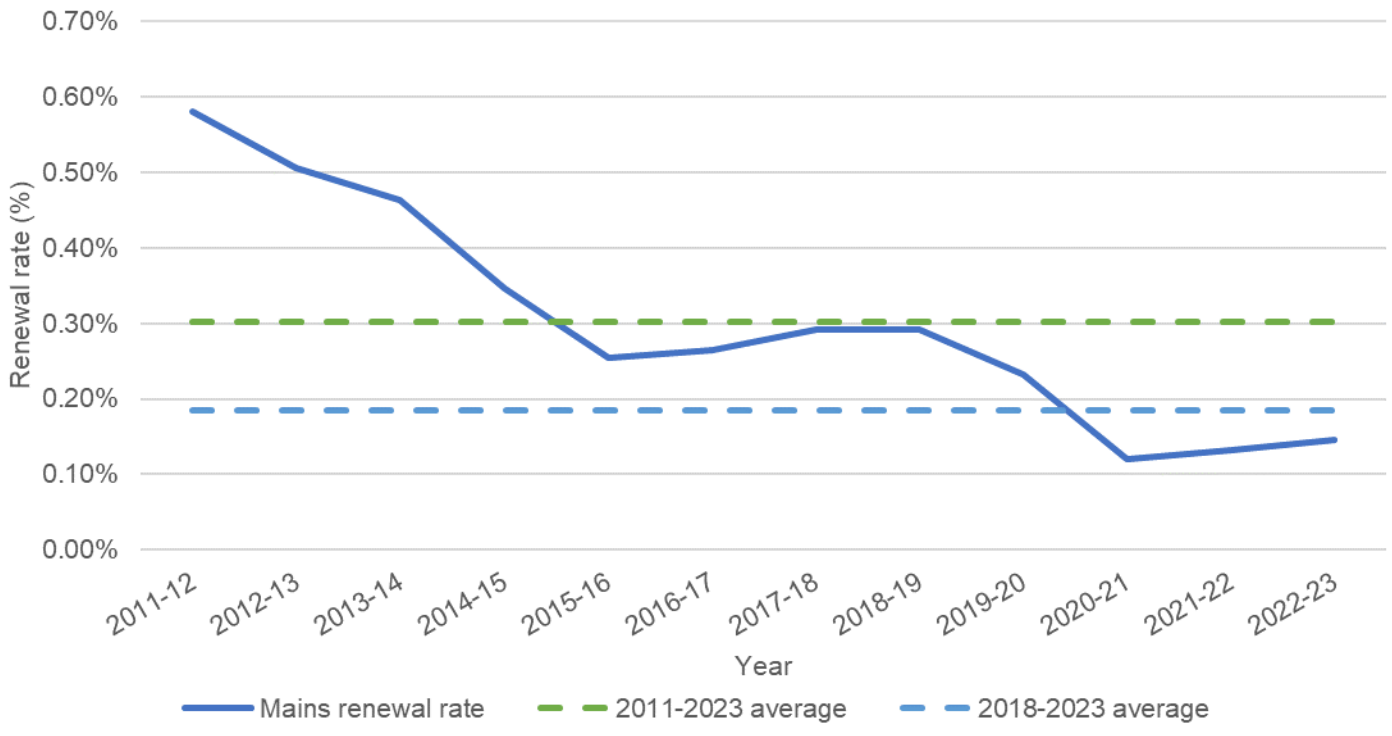
5.3.1. The time period for the renewal rate funded from base

359. Ofwat has used the full span of data covering the same period as the econometric models going back to 2011/12 to estimate the renewal rate funded from base. We do not think this is the right approach.

360. As can be seen from Figure 21 below, renewal rates have been on a downward trajectory since 2011. We think there are 2 key reasons for this:

- Consistent with our overall asset health case, the funding for capital maintenance is below the long-run equilibrium level. This means that increasingly, companies will have to adopt more reactive maintenance approaches as the allowance is not sufficient to operate on a more proactive basis. As a relatively low risk asset class, mains renewal rates have dropped to compensate and allow companies to operate efficiently within the totex envelope set by Ofwat.
- The increasing importance and challenge of PC and ODI targets has also resulted in a shift in expenditure from long term asset health needs to shorter term metrics incentivised by Ofwat through the regulatory framework. Mains renewal is a high-cost activity and only has a small, short-term impact on bursts and interruptions so will have been deprioritised by companies as they optimise their behaviour for the incentives set by the price control.

FIGURE 21: WATER MAINS RENEWAL RATES (2011-2023)

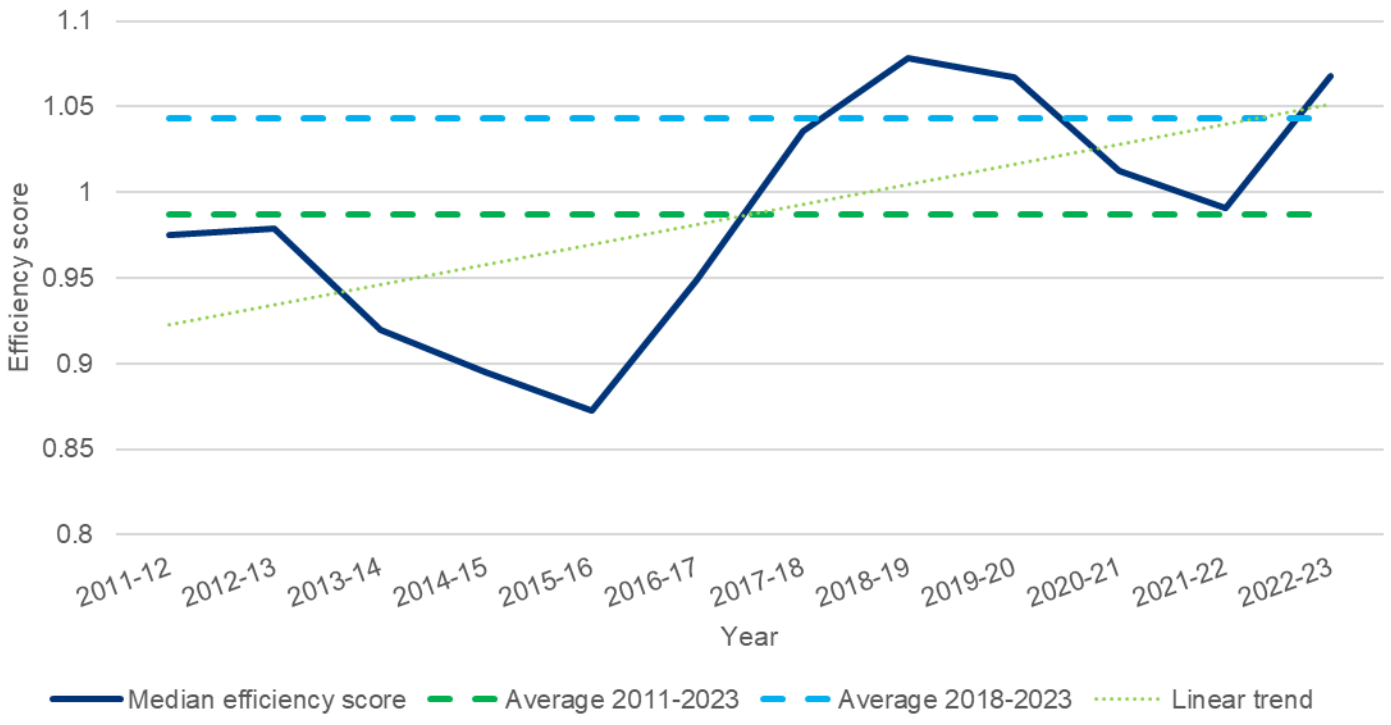


Source: Northumbrian Water analysis of the DD model "Mains renewal cost adjustment model"

361. Ofwat's approach to calculating base allowances also points towards using data from the last five years of the base cost modelling:

- The "predicted costs" from the base cost models use the entire dataset and an average of the activity over the whole period. If the sector were in a steady state and Ofwat used the predicted costs from the model to set allowances, then it would be reasonable to use an average since 2011/12.
- However, the sector is not in a steady state as explained above and shown in Figure 21, and Ofwat does not set allowances at the predicted cost level from the model. Instead, it uses an upper quartile calibrated using the last 5 years of data. This means that the level of costs and activity in those 5 years is baked into the upper quartile benchmark. Figure 22 below shows the evolution of the annual efficiency score for wholesale water from the DD cost model which shows a clear upward trend (reflecting greater demands from base) and that an upper quartile over the last 5 years reflects a different activity mix to the full dataset.

FIGURE 22: WHOLESALE WATER EFFICIENCY SCORES FROM THE DD COST MODEL



Source: Northumbrian Water analysis

362. Overall, it is clear from the evidence that a calculation based on the last five years is a more appropriate reflection of what is included within base expenditure allowances.

363. This issue is not unique to mains replacement in terms of what base buys or is reflected in the allowances. It is also relevant to the metering replacement adjustment and to the energy adjustment. Like Ofwat we think a

common approach in this area should be applied to all 3. In our plan, we assumed 5 years was the appropriate reference point for these assessments and continue to think this makes the most methodological sense.

5.3.2. The exclusive focus on grade 4 and 5 mains

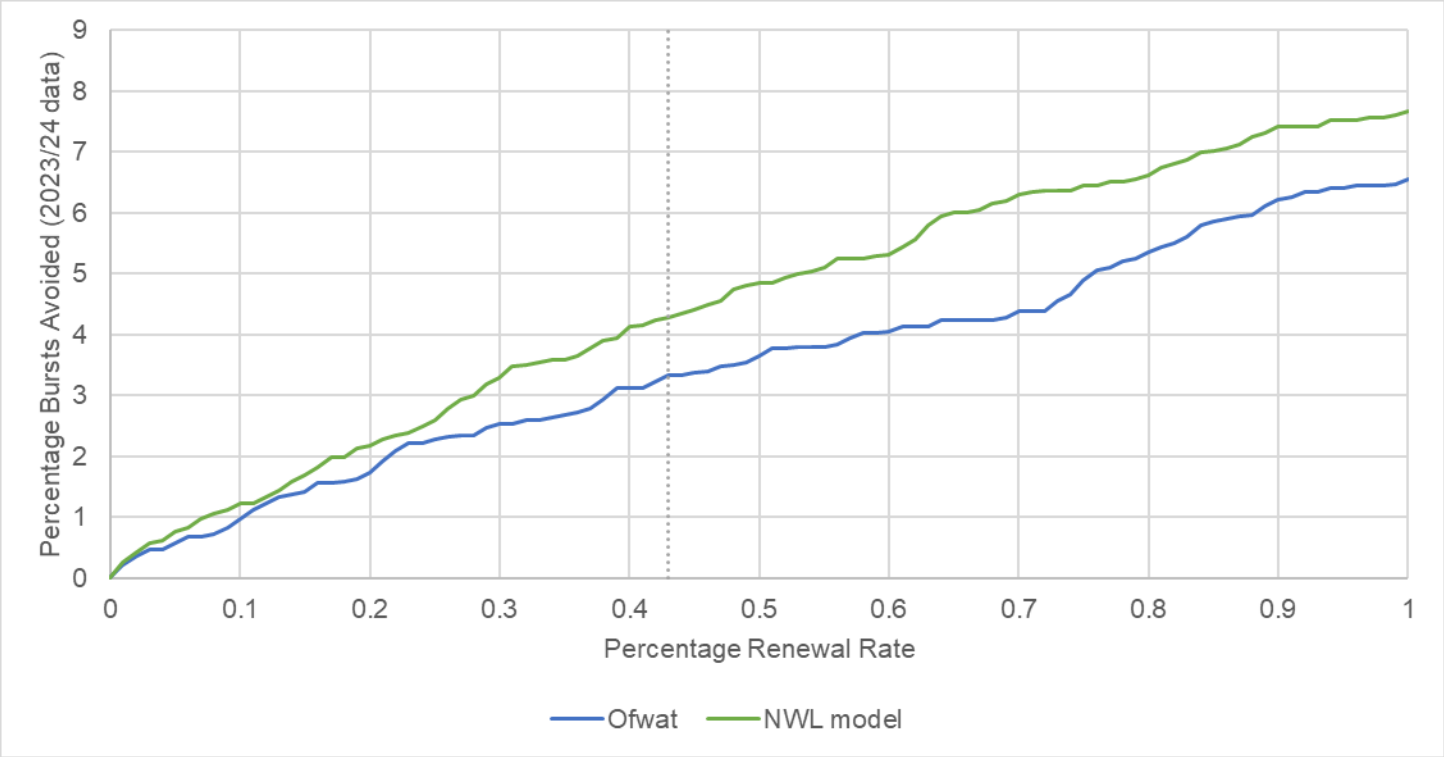
364. We can understand why Ofwat may think targeting grade 4 and 5 mains under its definition is an effective asset management strategy. However, we think that the picture is more complicated and that this approach may in fact be to the detriment of customers as set out below.

365. First, the pipe condition grades defined by the Ofwat methodology are not always a good representation of the actual condition of our mains:

- Ofwat's approach is only based on the last 5 years of the pipe history and is not representative of the long-term performance of the pipes which are long lived assets. By contrast, our own models contain 18 years of historical data for mains, and we therefore expect these to be more informative and accurate in predicting asset performance.
- Ofwat's approach does not take into account different deterioration rates. For example, some materials have much steeper deterioration curves than other materials and prioritising these materials, even at a lower condition grade, could reduce bursts over a long period compared to slower deteriorating assets. Deterioration rates can also vary for other reasons, such as ground conditions, which our asset models can capture.
- Some of the mains cohorts used by the Ofwat approach are quite short in length/time and therefore the implied condition grade is not representative of true long term asset performance. A small number of failures on a short length of main could generate a misleading condition grade.

366. As a result of these factors, targeting condition grade 4 and 5 mains is not as good as our model to predict pipe bursts and focussing on these grades of mains would result in our renewal schemes being inefficient and poorly targeted at reducing bursts. To demonstrate this, we have modelled the impact of targeting mains renewal on grade 4 and 5 mains as required by the DD versus the optimal strategy from our models on reducing bursts in 2024. This is shown in the chart below.

FIGURE 23: MAINS BURSTS AVOIDED FROM OFWAT'S APPROACH VERSUS OUR ASSET MODEL



Source: Northumbrian Water analysis

367. This shows that, at a renewal rate of 0.43%, our model reduces bursts by 28% more than Ofwat's approach of targeting condition grade 4 and 5 mains only. Combined with the reasoning above, we think this demonstrates that the approach outlined in the DD would be inefficient and poor asset management practice. For this reason, we also disagree with Ofwat's approach to set a more stretching mains repairs target because of its intervention – this policy proposal will not deliver performance improvements compared to our plan.

368. There are also some practical implications of adopting Ofwat's approach which is not as well targeted. For example, in order to hit the PC for mains repairs in Essex and Suffolk, we would need to renew more than the 0.43% level that Ofwat is proposing and in doing so we would run out of condition grade 4 and 5 pipes in 4 years.

369. Finally, bursts are not the only benefit that should be targeted from mains renewal schemes. For example, iron mains are prone to corrosion and can lead to issues with appearance contacts which can be avoided through their replacement. It is legitimate to also consider these potential benefits when selecting mains renewal schemes so that a more holistic programme of works in the overall customer interest can be implemented.

370. Overall, given the points above, we do not think that requiring companies to focus on replacing grade 4 and 5 mains is in the best interests of customers and instead companies should be given freedom to select the mains that offer the best opportunities to improve customer outcomes in the long term. We are also concerned that this

policy goes beyond the core capabilities of an economic regulator – companies are best placed to develop asset management strategies and well-intentioned interventions like this could be harmful for customers.

5.4. AN ALTERNATIVE APPROACH TO ASSET HEALTH FUNDING FOR PR24

371. While we are keen for Ofwat to engage with our points on our asset health cases above on civil assets and mains renewal, we also propose an alternative that could be implemented as part of the PR24 Final Determination to address sector-wide asset health issues.

372. The long-term asset health of water assets is a very important issue for the industry in order to manage future risks to customers and the environment. While the PR24 DD has given some attention to the concerns raised by companies and other stakeholders including the Environment Agency and the National Infrastructure Commission with the inclusion of the adjustment for mains renewal, we think the DD should be more ambitious and go further.

373. There is even a risk that by requiring companies to allocate a predetermined element of the capital maintenance budget to mains renewal that this could worsen outcomes and long-term risks by preventing companies from investing in higher priority assets instead. It also seems clear to us the PR24 framework has contributed to a situation where companies are reluctant to reveal their concerns over asset health. For example, our civils asset health cases were rejected which created a totex gap for base expenditure which Ofwat then assessed as "lacking ambition" in its quality and ambition assessment. It is therefore understandable why many companies have remained silent on the issue in their business plans.

374. Moreover, the issue that Ofwat has identified regarding mains renewal underinvestment is equally applicable to other asset classes – it is just less apparent as there is much less data (none in most cases) on these. We would expect there to be an increased incentive to undertake mains renewal compared to other form of capital maintenance as there is published data available on it. This encourages companies to do more as their activity levels are publicly visible and scrutinised by Ofwat. In areas without this visibility of information companies would not face the same incentives, so we would expect the same issues to exist (that is, insufficient replacement rates for a long run equilibrium of asset heath). This is consistent with the findings of the Reckon 'Infrastructure Health' study which identified an informational concern and the need for increased information to be available for asset health.

375. We therefore propose an alternative that would apply more widely than just to mains replacement. This could form part of an interim measure for asset health until PR29 when a more comprehensive package of measures could be put in place.

376. This alternative is based on the note by Reckon LLP for Water UK ("Opportunities for improving Ofwat's approach to asset health following the PR24 draft determinations")[169] and would provide an industry-wide adjustment to capital maintenance funding that could be used more flexibly than the proposed mains renewal adjustment proposed in the DD. This alternative could replace just the mains renewal adjustment but if made more ambitious could also replace our civil structures case as well.

377. The core features of this alternative comprise:

- **Uplift to capital maintenance allowances**: There are several different options here that Ofwat could base this on. It could be calibrated with respect to the uplift on mains renewal required to hit a 0.43% renewal rate but as outlined above would need to recognise that only 0.18% of this is funded from base allowances rather than the 0.3% assumed in the DD. Alternately it could base it on the cases brought forward by companies that did identify areas requiring additional asset health spend in the business plans such as our civil structures business case. Ultimately Ofwat would have discretion in this regard depending on its level of ambition for PR24 as an interim measure before a more enduring solution can be implemented at PR29.
- **Flexibility in how that uplift can be spent**: A key difference from the DD approach to mains renewal is that companies would have flexibility over what asset classes this funding would be spent on. This would allow companies to target the areas of greatest benefit to customers based on the risks posed by their own circumstances. The only stipulation that Ofwat may want to include that the uplift must be spent on capex solutions that will help maintain the long-term capability of the assets as this is most consistent with the intent of the uplift.
- **Eligibility criteria**: To help ensure that the money is well spent and to ensure that customers do not pay for things twice Ofwat may reasonably want to be sure that only companies meeting certain criteria would be eligible for this funding. We propose that companies should meet the minimum standard of 'competent' as part of Ofwat's AMMA assessment to ensure that companies have good processes in place around asset management. Ofwat may also want to restrict the uplift funding to companies that have spent their capital maintenance budgets in the past to avoid customers "paying twice". We think this is a more reasonable that focusing on a single asset class such as mains as companies may have reasonably invested in higher priority assets instead and, as discussed above, we do not think that Ofwat's measures of condition are the most accurate.
- **Customer protection**: To protect customers from non-delivery associated with this uplift we propose two measures. First, companies must spend their capital maintenance budget in full within the AMP to avoid having the uplift removed in its entirety. Second, beyond the capital maintenance allowance, the uplift will be granted on a 'use it or lose it' basis to ensure that companies do not benefit from under spending against this uplift and that it delivers its intended objective.

[169] This is due to be published on the Water UK website; we also provide the final version of the report with our representations as document NES80F.

- **Greater reporting of asset health information**: There needs to be greater information available on asset health in the water sector (this is consistent with the conclusions of the Infrastructure Health study by Reckon LLP)[170]. This would reveal how the condition and risk of assets is evolving over time which will promote better decision making in the future by both companies and Ofwat. We suggest that these are developed through Ofwat's operation Resilience Working Group and are implemented during AMP8.

378. A mechanism as outlined above would help promote better long-term outcomes by starting to address concerns over levels of asset replacement and maintenance within AMP8 rather than waiting until PR29 which will in our view lead to a worsening of asset health within the sector and a deterioration of underlying asset health as the funding available will be insufficient. We would be happy to discuss this idea with Ofwat further and to develop the details of how it could be operated if that would be helpful.

[170] To be published by Water UK – we also include the final report as NES80F

6. CLIMATE CHANGE ADAPTATION

6.1. OVERVIEW

379. In the draft determination, Ofwat removes all flooding and power resilience expenditure across the sector and replaces this with a sector-wide adjustment. Ofwat says:

> "We expect companies to use this increased expenditure to deliver a step change in resilience. As a key part of this, we want companies to improve resilience to climate change. We therefore propose to provide additional expenditure allowances of £300million to improve resilience to climate change, in particular resilience to power interruptions and flooding."[171]

380. Ofwat goes on to say that:

> "Eight companies requested enhancement funding of £188 million across water and wastewater for power and flood resilience (fluvial and pluvial). Most companies were unable to adequately justify their investment cases for flood and power resilience, particularly in relation to increasing climatic risks. Therefore, we make no specific enhancement allowance for pluvial/fluvial flooding or power resilience expenditure.
>
> "However, we acknowledge that the impacts of climate change are real, long standing and sector wide, and the lack of robust justification from companies does not remove the risk. We consider that even though companies generally fail to link a step change in climate change risk to measurable impacts on their assets and customer service levels, it is likely that these impacts are happening, for example given the recent frequency of storms and hot weather events. To address these impacts, enhancement funding may be necessary on top of the activity expected to be delivered through base allowances. This is seen as a precautionary measure given the risks of not intervening in a timely manner."[172]

381. Ofwat then allows a sector-wide adjustment uplift for all companies to prioritise their biggest climate risks, based on 0.7% of modelled base allowances in each of water and wastewater (the median of efficient company requests in these areas, after option and cost efficiency challenges).

382. We do not agree with a sector-wide adjustment, as this is not a sensible approach. Companies have different risks from climate changes and require different investments to tackle these risks. There is no reason to think that the sector wide allowance proposed at DD is at the right level to tackle these risks, with no link made to climate evidence or analysis of actual impacts on water companies.

[171] Expenditure allowances appendix, p5
[172] Expenditure allowances appendix, p115

383. Instead, Ofwat should assess enhancement cases individually, particularly for power resilience where there are clearly different risks across the sector.

384. In this section, we explain why a sector-wide adjustment for climate resilience is not sensible; and we show that the approach Ofwat has taken to setting this at DD is not right (section 0). We go on to discuss the challenges of assessing the risk of cascading infrastructure failures, and why it is difficult to assess baseline risk when we cannot access the underlying information. We appeal to Ofwat to allow investment to tackle this risk regardless, in line with previous views from NIC and the CMA (section 6.3)

385. If Ofwat does not allow this investment, we explain why extreme weather exclusions in ODIs should be used to recognise that cascading infrastructure failures are outside of the control of water companies (section 6.4). Finally, we discuss who should bear the risk of cascading failures, and propose solutions to this. We ask Ofwat to commit to working with Ofgem to tackle this in the longer term (section 6.5).

386. In our separate appendix NES32A, we have provided more evidence to address Ofwat's concerns under the deep dives for flooding and power resilience across water and wastewater.

387. We asked our customers what they thought we should do in response to Ofwat's DD (see NES82). Results were mixed. Some customers felt that this investment was a priority to avoid disruption in regard to service failures, and should challenge Ofwat as this was in line with customer decisions during the development of the business plan[173]. Others felt that Northumbrian Water could not predict with accuracy what the impacts of climate change would be, and were prepared to trust Ofwat's judgement on this (as they felt they would act in the best interests of the customer)[174]. However, the majority of customers felt that it would be unfair to limit the spending that Northumbrian Water could make and then **also** penalise them for extreme weather (which is outside their control). Panellists suggested that Ofwat were not permitting suitable investment to minimise the risk imposed by extreme weather events[175]. In some cases, customers thought that Ofwat should take responsibility for any decision not to allow funding for this level of resilience, rather than fining water companies[176].

388. We also discuss our other climate change adaptations (for process enhancements) in section 0. We provide more evidence to address Ofwat's concerns under these deep dives in our separate appendix NES24A.

[173] NES82, p37
[174] NES82, p38
[175] NES82, p40
[176] NES82, p40

6.2. SECTOR-WIDE ADJUSTMENT FOR CLIMATE RESILIENCE

389. This is not a sensible approach, for several reasons.

390. Firstly, we have established that there are different risks in each part of England and Wales[177]. Our assessment of flooding resilience looks at actual flooding risks, including likely depths of flood water, and how these change over time – before targeting specific and detailed risks. We looked at this because our assessment of weather risks had shown that we were particularly at risk from flooding. Our assessment of power resilience looks at the impact of increasing storms in different parts of the country, which shows that for example the North East is the only region that has projected increases in average wind speeds and extreme winter weather gusts[178].

391. Ofwat's approach provides the same relative allowance to all companies – regardless of the actual risks from flooding and wind. Based on the evidence from our work, we would expect most companies to be less concerned about the risks from increasing wind storms, and more companies in the midlands and the south of England to be concerned about the risks from increasing temperatures (which, as we described in our separate climate resilience enhancement case, are limited to tackling specific risks related to short periods of extreme temperatures before 2030, rather than requiring wider investment now). This means that some companies will have additional funding but no increasing risks to address – for example, Thames Water, which put forward no investment, received £64m of funding. Our analysis of climate risks shows that London would expect a *reduction* in both windstorms and flooding risks from the current baseline, so it is likely that Thames Water does not need this funding to address future climate risks of this type in 2025-30. Instead, Thames Water faces different pressures and resilience challenges.

392. Ofwat's statement that "impacts of climate change are sector wide"[179] is demonstrably not true: there are regional differences in climate change expectations under UKCP18; and there are differences between the infrastructure and landscape in each area that mean that climate change has different impacts (for example, increasing windstorms have more impact on a less resilient power network, such as in the North East). So, these allowances should not be distributed evenly, but instead allocated to the companies who have identified a need for this investment and put forward evidence to show that this is required.

393. Secondly, taking the median of efficient company requests in these areas, after option and cost efficiency challenges, is not sensible. These schemes are not the same and look at different baseline risk positions and propose different amounts of protection. It is likely that companies have scaled their investment to match what they thought would be needed by 2030, and what they thought could meet Ofwat's expectations under the PR24 methodology. The QAA incentivises companies not to put forward investment where they do not think they can

[177] See our climate change resilience assessment from our business plan, NES52.
[178] Climate change resilience assessment (NES52), Figure 2.6 and 2.7
[179] PR24-DD-W-Resilience and PR24-DD-WW-Resilience models, several worksheets

meet the Ofwat requirements, regardless of whether or not this investment is needed. The median then relies on Ofwat assessment of the quality of evidence in the case, rather than any attempt to quantify the actual costs that are needed to meet the requirements. Ofwat's deep dives invite companies to explain and provide more evidence before FD, rather than setting realistic efficient costs.

394. Thirdly, it is not fair to say that companies cannot justify this investment robustly – as Ofwat does – because Ofwat has also not been able to quantify or link this step change in climate risk to a real impact on customers:

> "However, we acknowledge that the impacts of climate change are real, long standing and sector wide, and the lack of robust justification from companies does not remove the risk. We consider that even though companies generally fail to link a step change in climate change risk to measurable impacts on their assets and customer service levels, it is likely that these impacts are happening, for example given the recent frequency of storms and hot weather events."[180]

395. It is particularly frustrating to see our plans ruled out for power resilience in extreme weather, where we have seen major impacts from cascading infrastructure failures – which are largely beyond our control and require intervention from government to establish how and where action should be taken. We have provided significant and new evidence to show that this is an increasing problem, and Ofwat recognises that it is likely that these impacts are happening. However, it is still unwilling to take leadership in acting on this – and so has ruled this out of scope because we cannot quantify the baseline risk position, and by how much it is increasing. We explore this more in section 6.3.

6.3. THE RISK OF CASCADING INFRASTRUCTURE FAILURES

396. In its Second National Infrastructure Assessment[181], the National Infrastructure Commission recommended to Government that it should require regulators to put in place a system for cross sector stress testing which addresses interdependencies and the risk of cascade failures. NIC refers to the Third UK Climate Change Risk Assessment (CCRA3) Technical Report, which said that:

> "Fundamentally, [cascading failures] is an area where non-governmental action will not manage the risk in the absence of government intervention. Public bodies and private organisations that manage, operate and maintain infrastructure have to meet statutory requirements and performance standards for the services they provide, and climate change is one of the risk factors that they should account for in their decision making in order to fulfil their obligations. In the specific case of infrastructure networks, the presence of complex interdependencies coupled with uncertainty around climate change makes it challenging to fully understand and thus address the risks posed (information failures). Further, in

[180] Expenditure allowances appendix, p115
[181] NIC, October 2023

> dealing with cascading failures, which require some degree of system thinking, significant governance barriers exist, which affect not only the level of preparedness of the infrastructure network, but also the type of response to failures and disruptions. In fact, the interconnectivity between the infrastructure assets means that any poorly defined responsibilities, or lack of co-ordination between various operators, could undermine the ability to anticipate, react, and recover from cascading failures. Government can play a key role in adopting a system-based approach to planning for resilience by providing the information to enable this, and providing infrastructure operators with a regulatory framework that supports adaptation at network level rather than at the level of individual assets."

397. There is also no independent or regulatory standard set for power resilience. The Climate Change Committee's 2023 **annual assessment of progress report to Parliament**[182] explains that climate impacts can also cascade across sectors due to infrastructure, nature, and socio-economic interdependencies between them. It says that:

> "despite the potential for damaging cascading impacts, consideration of these interdependencies in adaptation planning is lacking. Currently, there are not clear responsibilities and mechanisms for cross-Government collaboration, which is needed to enable a more systematic assessment of interdependency risks. Consistent minimum resilience standards across sectors, enforced through remits for climate change resilience in key sector regulators, are also largely absent."

398. In the case of power failures and consequential pollution incidents at pumping stations, there has been no coordinated approach or cross-Government collaboration between regulators and Government. Ofgem has set standards for DNOs that allow for short duration power outages and outages associated with extreme weather events, and has not set expectations (or allowed funding) to meet the standards that would be required to avoid increasing pollution incidents.

399. In our response to query OFW-OBQ-NES-168 we explained that we cannot easily determine the baseline and increasing risk from power resilience using quantitative analysis. There are no industry models available for identifying the impact of wind or third-party power outages, and so we undertook a detailed resilience and criticality assessment to help prioritise the sites that we put forward for investment in PR24. This assessment quantified the likelihood and consequences as a result of wind and third-party impacts on our assets.

400. The UK Government has signalled a commitment to improve standards for resilience by 2030 under the new **UK Resilience Framework,** published in 2022, but has not yet set out a pathway to deliver new standards for infrastructure resilience to climate conditions that would work across sectors (as confirmed by the Government's **December 2023 update**).

[182] Climate Change Committee **annual report to Parliament**, 2023

401. We strongly support setting consistent resilience standards, and particularly for considering the impact of cascading risks across systems – and how this could be addressed most efficiently for customers and the environment. However, this is not yet in place across Government and regulators. We engaged extensively with Northern Powergrid who have advised us that their standards for power interruptions are less stringent than ours, meaning that pollution incidents and interruptions to supply can occur when DNOs are meeting their regulatory standards which have specific exclusions for exceptional weather events.

402. We demonstrated in our enhancement case that climate change has led to more extreme weather events with a higher risk of these in future – but explained that we have not been able to quantify this impact for power resilience. This is because Northern Powergrid is not able to estimate when, where, and how frequently service failures will occur. They have told us that they are aware that their asset health of their electricity poles is worse than other areas of the country, which can lead to a greater level of longer duration power outages especially during storms. It is clear that extreme weather events are outside of our control and can lead to substantial impacts on customers.

403. So, we do not have any method of quantifying the future risk – and so instead in NES32, we described the history of power faults at water and wastewater sites over the last five years and the impact this had. Our resilience assessment included considering the number of pollution incidents that have occurred due to Northern Powergrid failures and whether they occurred in severe weather conditions (alongside other criteria such as the criticality of the assets, vulnerability of waterbodies, and response time to incidents).

404. We would have preferred to be able to quantify these risks – as this type of quantitative analysis is helpful to explain and justify making these investments now. However, without consistent standards on power resilience and cross-sector regulation to allocate the risks of cascading failures, the information is not available to support this. This prevents us from undertaking a more detailed analysis than what we have provided in our enhancement case.

405. However, this lack of quantitative analysis should not prevent any investment being made. When considering resilience investments in their PR19 redeterminations, the CMA said that:

> "While quantitative analysis of the kind Ofwat has described is often helpful and is widely used within the regulatory regime, we do not consider that its absence should result in an outright rejection of a proposed resilience scheme in all cases. Instead, this case falls to an exercise of judgement regarding the evaluation of the specific facts available, and their implications. This is consistent with the CMA's general approach to evidence assessment."

406. As one of their key considerations, the CMA considered if the "near misses" which Northumbrian Water suffered in 2016 and 2018 at Layer WTW represented reliable evidence of a supply risk in our water network. The CMA considered that actual experience of "near misses" represented strong evidence for a potential risk, which would

support the need for intervention. They said that "when assessing the operational resilience of a network, an ex-post assessment of areas of actual failure (or near-failure) appears a straight-forward and effective approach to identifying sources of risk within the network". The CMA also noted that they had substantial concerns with an approach to allow investment to be deferred to the next price control to allow Northumbrian Water to develop its case – as this results in customers continuing to be exposed to the identified risk. We describe similar "near misses" in NES32, including the impacts on pollution incidents from power failures at sewage pumping stations and the historic loss of power and the impact on customers[183].

407. In our enhancement case NES32, we described the impact that power failures have had on our assets, customers, and the environment, and the increasing risk from climate change. We also described our vulnerability assessment, which helped to provide evidence in the absence of data to carry out a quantitative analysis of risk directly. This investment cannot wait until PR29, as customers and the environment will continue to be exposed to unnecessary risks from power failures that are not within our control. We made the decision to include only these highest priority sites in AMP8, reflecting our customers' views that they wanted us to show that improvements were likely to have an immediate impact on services. We have shown how we expect pressure on base service levels because of this increasing risk, and the commitment we are making to customers about the benefits they would receive from this investment.

408. Ofwat should **reconsider their position on power resilience and cascading failures**, particularly on wastewater power resilience, and exclude this from any sector wide adjustment. Power failures at sewage pumping stations are now the leading cause of pollution incidents, and the issue of cascading failures is causing our previously sector leading performance to deteriorate. Without material investment to meet this risk, which we would be unable to make without specific enhancement funding, this will continue to be an issue.

6.4. EXTREME WEATHER EXCLUSIONS

409. Alternatively – if these are ruled out, then performance commitments need to change accordingly. The removal of extreme weather exclusions means that there is a significant downside in the event of extreme weather that cannot be managed. We provided a report to Ofwat's Future Ideas Lab[184] that showed that while companies are funded to maintain and develop their network to a particular level of resilience to weather events, extreme weather events are not funded.

410. The climate assessment we undertook in NES52 and NES53 demonstrates that windstorms (such Storms Desmond and Malik) are likely to increase in both their severity and their frequency across our region. Our

[183] Table 40 of NES32
[184] Frontier Economics, Managing Extreme Weather Event Risk

enhancement business case also demonstrates the impact that these recent windstorms have had on our performance areas had the effect they have on the environment and to our customers.

411. For example, Storm Arwen resulted in severe consequences at some of our water and wastewater sites:

- Power outages caused shutdowns of some sites. The widescale loss of telemetry and mobile communications between remote sites and the Regional Control Centre meant that understanding the scale and extent of issues was a challenge.
- Loss of power causing sites and assets without on-site generation to fail (water treatment, water pump stations, water reservoirs, wastewater treatment sites and wastewater pump stations).
- For water assets this caused source water production to cease and water in service reservoirs to continue to supply customers until these reserves were exhausted. At this point, interruptions to customer water supplies occurred.
- Water supply interruptions peaked at approximately 8,000 properties at around 14:00 hrs on 28 November 2021. More than half of these interruptions were restored by 22:00 hrs on 28 November 2021. By 09:00 hrs on 30 November 2021, interruptions were still being experienced by fewer than 1,200 properties. All interruptions were restored by 12:00 hrs on 7 December 2021.
- For wastewater assets this caused pumps to cease operation, leading to chambers filling and then, potentially, overflowing to watercourses. This resulted in 55 pollutions incidents reported to the Environment Agency.
- Access to sites was also initially disrupted by fallen trees and unsafe travel conditions.

412. However, from 2025, Ofwat will remove extreme weather exclusions from the definitions of some performance commitments – and the EA do not accept power failures as an exclusion for pollution incidents. This increases the exposure of water companies to risks that they cannot control, as they face both the costs of tackling the incident itself, and the regulatory penalty from impacts on service. Moreover, the scale of the incentive regime is being increased.

413. This risk could be controlled to some extent by creating our own “resistance” to extreme weather events, and so bringing this more within our control. In our enhancement case NES32[185], we described the two key risks that we must consider when deciding to improve our power resilience:

- The asset health of the Northern Powergrid Network.
- The differences in service levels set by Ofgem and Ofwat for levels of service.

414. We provided evidence in NES32 to show that Ofgem’s service level agreements allow DNOs three minutes before a “power outage” is recorded as an interruption, and that Northern Powergrid has a history of 1,500 power faults

[185] NES32, section 2.9

at wastewater sites and 1,000 faults at water sites over the last five years[186]. This information shows that 57% of power outages affecting our assets were greater than 30 minutes, 23% were between 10-30 minutes, and 20% were between 3-10 minutes. Outages of less than one second can cause water companies to lose site operation and visibility, which can trigger interruptions to supply and pollution incidents. We provided examples of power failures related to climate change (Storm Arwen) and "near misses" related to DNO asset failures in our enhancement case NES32[187].

415. Our Annual Performance Report for 2022-23 explained that:

> "Power issues remained one of the main reasons behind the increase in wastewater category 3 incidents that particularly impact sewage pumping stations (SPS). These are connected to incoming power supplies where power cuts or very small interruptions, often referred to as a 'brown-out', can cause significant issues to our powered sites. Internal power issues can also occasionally affect our service. We continue to put in place measures to increase our power resilience, such as improved arrangements for generators and engagement with our power Distribution Network Operator (DNO) to address risks."

416. In previous years, pollution incidents attributable to significant storms have been removed or categorized as no impact (category 4 incidents). These decisions by the EA reflected that these types of incidents were deemed to be outside of our control following full investigations. For 2023 onwards, the EA expects that we will have resilient plans in place to manage severe storms and maintain our service to minimise pollutions. Our systems are not currently capable of dealing with the most severe storms in all circumstances and this change in stance from the EA is also therefore resulting in a greater number of incidents being recorded. In our **2023-24 APR**, we noted that severe weather events such as storms or flooding are expected to increase in frequency due to climate change which will increase their potential to disrupt the operation of our assets, particularly if they affect power supplies. Our Business Plan for 2025-30 set out robust proposals to address this for power resilience and for the changes in pollution reporting, but we noted in our APR that recovering performance on pollution incidents would be dependent on provision of associated funding.

417. DNOs are not incentivised to fully mitigate against the risk of either short duration power outages, or outages associated with extreme weather events[188]. Both of these have the potential to disrupt our service provision, and we have shown that this has happened many times in the past (and continues to happen). We are exposed to a significant risk in relation to power supply resilience.

418. Northern Powergrid and other DNOs have severe weather exclusions within their service standards. This means that the regulatory framework across sectors – taken together - requires water companies to tackle power

[186] NES32, p28
[187] NES32, section 2.9
[188] We replicated the relevant table from Ofgem's RIIO-ED2 as Table 18 of NES32.

resilience in the event of severe weather. Our engagement with Northern Powergrid provides evidence (NES32, section 2.9) that third party outages are not within our control and that our proposal for AMP8 is also “no regret” from a systems-thinking point-of-view (that is, this issue will not readily be solved by Northern Powergrid or others in the short or medium term).

6.5. WHO SHOULD BEAR THE RISK OF CASCADING FAILURES?

419. All of this means that the risk of cascading failures is shifting, and regulators are not considering or addressing this. Up until 2025, water companies were expected to use a “recovery” strategy in extreme weather – that is, services would fail temporarily during extreme weather events but customers were prepared to accept this in exchange for lower bills (under the condition that recovery was efficient, effective, and supported vulnerable customers appropriately). Companies bear the cost of this recovery, as part of their normal base operations.

420. With the removal of extreme weather exclusions, water companies are now expected to adopt a “resistance” strategy – that is, services should continue to operate during extreme weather events, and companies will be penalised under ODIs if they do not. This requires systems and assets to be “hardened” to be resistant to more and more weather conditions, and this has not been previously funded in price reviews.

421. We describe how we engaged with our customers on this approach in NES32, including the two criteria we set based on their guidance – that is, investing where 1) there is a high likelihood that climate change would have an impact on our services in the short or medium term, under any future climate change scenario; and 2) that improvements are likely to have an immediate impact on services (for example, in our customer research we described pollution incidents from sewage pumping stations as a key area). We noted in our business plan tables that this is a non-statutory investment (as customers can choose to accept/tolerate an increasing risk), and our customers preferred to make these investments to adapt to climate change.

422. Our research showed that customers do prefer to move to a “resistance” strategy to avoid pollution incidents and supply interruptions and are willing to pay more in their bills to do so[189].

423. We do not think it is right that water customers should bear the costs of the **failure of energy companies** to maintain resilient systems in the face of climate change and increasing extreme weather. However, Ofgem does not agree with this and, through extreme weather exclusions, places the risks on energy customers – including water companies and their customers who rely on energy networks to prevent interruptions and pollution incidents in extreme weather. Until 2025, these risks were shared between water customers (who had to accept service interruptions) and water companies (who had to bear the additional costs of recovering from interruptions).

[189] NES32

424. From 2025, the EA and Ofwat are now placing these risks onto water companies through ODIs that no longer include extreme weather exceptions – and these risks are not under water company control either. Water companies can only respond to these risks by putting forward investments to "resist" extreme weather – and if these investments are not funded through enhancement, face either large penalties through ODIs or a large unfunded investment programme which is material and has clearly not been required by Northumbrian Water or any company under base expenditure before. In this way, Ofwat is not allowing efficient companies to finance their function to mitigate these issues and deliver their performance commitments or legal requirements.

425. There are three ways that Ofwat could address this:

- Ofwat could include **enhancement funding** for power resilience, which would improve our capacity to continue delivering a service to customers when energy networks fail. As we said in NES32, this is not a complete solution to this problem and there will still be some issues in less critical locations if power supplies fail.
- Ofwat could include extreme weather exclusions in the **supply interruptions and pollution incidents PCs** – or a variant of this, such as excluding impacts that are due to power failures (where we have not had enhancement funding for backup power supplies). Alternatively, Ofwat could recognise this impact by increasing the performance commitment levels to reflect the likely failures for extreme weather in some years. This is not likely to be as effective as exclusions, because the annual performance against these PCs would then be driven largely by chance (depending on the weather in that year) and so would be less useful as a tool for measuring performance.
- Ofwat could **work with Ofgem** to address the issues of cascading failures, as recommended by the NIC. This could be a relatively simple solution, such as requiring energy companies to prioritise water and wastewater infrastructure in the event of extreme weather; or it could be more robust, such as requiring energy companies to provide back-up power supplies and/or cover ODI payments to water customers in the event of failures. Water companies cannot currently do either of these through contractual arrangements. In the longer term, it would be sensible to consider the wider system and where risks should lie, and Ofwat might wish to wait until that can be done.

426. Unfortunately, it is now too late for PR24 for even a simple solution to the issue of cascading failures, as this would likely require legislation or regulatory changes which will not apply immediately. We urge Ofwat to recognise this issue and act.

427. We propose a detailed definition for extreme weather exclusions in section 6.4.

6.6. CLIMATE CHANGE PROCESS ENHANCEMENTS

428. In enhancement case NES24[190], we explained our assessment of the impact of rising temperatures on our existing water treatment processes and set out our plans for protecting vulnerable WTWs from the effects of climate change. In particular, we looked at three specific risks where increasing average temperatures and hotter summer periods threaten resilience. We provided the evidence that issues were linked to increasing temperatures (from air temperatures for hypochlorite storage; to raw water temperatures for slow sand filters and rapid gravity filters).

429. Ofwat's draft determination accepted the evidence for two out of three of these risks, and we provide further evidence in NES24A – supplementary information for climate change process enhancements to demonstrate the need for investments at rapid gravity filters – including showing more clearly that this is directly linked to climate change. We consider this investment to be low/no regret because it is needed under both the benign and adverse Ofwat common reference scenarios for climate change. We agree that we could have provided more evidence about the options we considered and explained our benchmarking in more detail, and we provide this evidence with our draft determination response.

430. In our enhancement NES24, we explained that we are tackling the risks to water quality and security of supply now, in 2025-30, because[191]:

- These hazards have the potential to impact on service levels now. The heatwaves and higher average temperatures experienced in recent summers are already impacting on stored hypochlorite degradation and dissolved oxygen content in sand filters.
- Although uncertainty remains about future temperature changes, it is unlikely that these investments would be unnecessary given current and expected temperatures in the near future (rather than in the long-term).
- These enhancements could provide an immediate reduction in risk to service levels.

431. There is likely to be further investment needed in the future, and we explained in the resilience appendix to our business plan[192] that we will assess the potential for higher temperatures to affect wastewater treatment processes during 2025-30. This could involve, for example, looking at the performance of biological systems (where saturated soil may lead to less effective treatment of water) and sludge management under different temperatures. This is in addition to incorporating climate change forecasts into our WMRP, DWMP, and asset health assessments which identify the potential needs for new investment under different climate change scenarios.

[190] NES24
[191] NES23, section 2.1.1
[192] NES09

7. FURTHER EVIDENCE ON OUR COST EFFICIENCY

432. In some areas, the draft determination allows for significantly less funding than our business plan. These interventions are mostly not made through econometric or unit cost models – which broadly show that our business plan enhancement costs are efficient – but are instead mostly from adjustments made through deep dives or policy decisions.

433. In some cases, we understand why Ofwat has challenged us through a deep dive to provide more evidence – and we have met this challenge by providing this evidence either in this document directly, or in separate documents where this requires more detail (we describe these separate documents in each section below). For some of these – such as reservoir safety – we acknowledged that we had limited information at the time of the business plan submission, and we can now provide this information.

434. In other cases, Ofwat has made some broad assumptions about costs and there are some models and decisions that provide very variable results or are not supported by a deeper understanding of our business plan or the engineering practicalities. Assessing enhancement cost efficiencies has clearly been a very difficult task, and we provide more evidence to support Ofwat in improving this approach further. We also comment on the approach Ofwat has taken to assessing cost efficiency and explain where (and why) we disagree with Ofwat's decisions.

435. Ofwat has used deep dives to assess some areas of expenditure. These then apply only downside adjustments to our costs, where Ofwat does not think we have looked enough at options or costs. In some cases, these decisions are not well justified – with no evidence provided to suggest that alternative options could be cheaper, or that our costs are higher than others. It does not follow that where benchmarking information cannot be provided, costs must be inefficient or that investments can be delivered for less in practice. For example, Ofwat reduces our cost allowance for NIDP but does not really have any expectation that we could deliver these projects for a lower cost (see 7.11). Even where these deep dives are justified, this approach leads to only downside adjustments – and so provides an overall average cost allowance which is too low, because it selects only reductions in costs.

7.1. BASE COSTS

436. Generally, we think that Ofwat's approach to base costs for PR24 is reasonable in terms of the models adopted and the use of an upper quartile challenge (notwithstanding our broader long-term concerns around asset health etc). Our modelled base costs were within 3.3% of Ofwat's allowance for the DD (not including the reallocation of our asset health enhancement to base - see section 1, and after efficiency and RPE assumptions). We used the most ambitious frontier shift assumption of all the water and wastewater companies (at 0.8%).

437. However, with Ofwat overlaying additional assumptions which are very challenging for companies, there is a severe risk that the overall level of challenge is not achievable even for the best performers in the sector.

438. In particular, we think that Ofwat needs to remedy its approach for:

- **Business rates**: It is not credible to assume that there will not be any revaluations during AMP8 and estimates of the impact of these should be included in allowances ex ante to avoid both and expected loss for companies and cashflow timing issues for the gap between charges being incurred and the true up during AMP9.
- **Frontier shift**: a 1% per year rate of improvement is extremely ambitious and we do not think it is consistent with expected rates of productivity improvement in the economy or what can realistically be achieved by water companies. Our proposed rate of 0.8% was already ambitious and a more realistic target.
- **RPE true up for chemicals**: AMP7 has shown that chemical prices can be extremely volatile and an RPE true at the end of period would ensure that customers do not overpay and that companies can recover their efficient costs which would be an improvement in outcomes. Contrary to the DD we consider that an appropriate index does exist as proposed in our business plan.
- **Modifications to the energy cost adjustment**: The rationale for the mechanism is strong but to improve implementation we think that it should use a different RPE forecast (as water company costs will not track wholesale prices due to hedging) and that a slightly different index is more appropriate for the true up (as energy intensive users could distort the proposed index in the DD).
- **Addition of increased Environment Agency discharge charges**: since water companies submitted their business plans the Environment Agency has significantly increased its charges on wastewater discharges which need to be reflected in the FD.
- **Changing the calculation of what base buys for the industry wide cost adjustments**: for the mains renewal, metering replacement, and energy costs adjustments Ofwat calculates what base buys using the full span of data feeding into the cost models. We think this should be replaced with an assessment over the last 5 years to align with the calculation of the efficiency scores in the base cost models.

439. We set out below our detailed feedback on these items in turn in the sections which follow. We have also provided Ofwat with our views on the net zero cost adjustment where it was seeking to understand what the sums would be used for, and we have provided some high level feedback on some other areas of the DD.

7.1.1. The FD needs to reflect the upcoming revaluations in business rates

440. The DD does not take account of the 2026 and 2029 business rates revaluations, which result in underfunding during AMP8. The 90% pass-through arrangements mean that we would incur a loss on these charges, even once trued up. To compound these issues, the delay in the true up funding under the DD would be material enough to cause our credit metrics to fail the BBB+/Baa1 thresholds. At the same time, it would create tariff volatility, increasing customer bills by over 9% in 2030/31.

441. To explain how we have arrived at our proposed figures in line with the Valuation Office Agency (VoA) we have explained this further below – and propose an alternative approach.

7.1.2. Background on water cumulo rates and DD treatment

442. PR24 spans three business rates cycles, which follow 3-yearly periods:

- The 2023 business rates valuation spans three years from April 2023 to April 2026.
- The 2026 business rates valuation spans three years from April 2026 to April 2029.
- The 2029 business rates valuation spans three years from April 2029 to 2032.

443. The tax for 2025/26 is known because it is based upon the actual valuations for 2023. However, the remaining four years are unknown at the time of the DD and FD because the 2026 valuation is not expected until early 2025 (and the 2029 valuation is, of course, some years away).

444. In the DD, Ofwat is proposing to use 2023 Actuals and has dismissed our business plan estimates for what the 2026 and 2029 valuations are likely to be. Ofwat has also proposed a 90:10 sharing rate, in light of the uncertainty over the future valuations.

445. We have sought external advice on the expected approach that the Valuation Office Agency (VoA) is likely to take for 2026 and 2029, based on past VoA precedent. We have then simply rolled-forward the likely VoA approach using Ofwat's own allowances in the DD to derive updated business rates forecasts for 2026 and 2029. We can provide the calculations behind these figures upon request from Ofwat.

446. To assist Ofwat in understanding these forecasts, we summarise the VoA's standard methodology and explain the calculations we have undertaken in the sections below.

7.1.3. The VoA's methodology

447. Business rates are usually calculated as the market rent of a particular building (its 'Rateable Value') multiplied by the relevant tax rate (the 'Multiplier').

448. In the absence of an observable market rent for a water network, the VoA estimates what a hypothetical retail tenant would pay to rent the network, to derive its Rateable Value.

449. To do this, the VoA estimates the forward-looking expected profits from operating water network, water resources and the retail business (referred to as the 'Divisible Balance'). It is assumed that a portion of the Divisible Balance is required by the retail tenant to cover the costs and risks of running a retail business, leaving a residual profit that the retailer would be willing to pay in rent. The Rateable Value is taken to be this residual profit.

450. Two methods are typically used to estimate the retail profit: the split of assets approach, and the return on capital approach, with the VoA tending to use the split of assets as the primary approach, and the return on capital approach as a cross check.

451. We can see from the 2023 valuation model that:

- The Divisible balance is derived by taking allowed revenues and costs, using PR19 data for water network, resources and retail.
- The split of assets approach is taken as a VoA estimate of tenant's assets as a proportion of the RCV, with a 15% uplift for tenant's risk.
- The tenant's share is then deducted from the Divisible Balance to arrive at the Rateable value.

7.1.4. Our roll-forward of the VoA's methodology

452. We understand from discussions with our external advisers that the VoA's methodology has remained broadly unchanged since c.2000 – that is, for the last five valuation periods (the reset period was every five years until this was reduced to three years from 2023 onwards).

453. We have therefore forecast the 2026[193] and 2029 valuations, using the same methodology as applied in 2023 and using Ofwat's own revenue, cost and RCV estimates from the PR24 DD as inputs. More specifically we:

- Derive the Divisible Balance based upon:
  - Water network and water resources allowed revenues.
  - Less PAYG and 95% of RCV run-off (with 95% being the standard VoA assumption of the portion of RCV run-off that would be covered by the landlord)
  - Add the pro-rata retail margin that covers water.
- Derive the tenant's asset figure by inflating the VoA's 2023 estimate.
- Derive the tenant's share of the Divisible Balance by taking the tenant's assets as a proportion of the RCV, with a 15% uplift for tenant's risk.
- Remove the tenant's share from the Divisible Balance to derive the Rateable Value and apply the 2023 multiplier.

7.1.5. Implications of Ofwat's approach in the DD

454. As the explanation of the VoA's methodology above shows, in a cycle where the RCV and WACC is increasing, the Divisible Balance and therefore business rate liability will increase. So, it is clear that the 2026 and 2029 business rates liabilities will be higher than 2023, which was based on PR19 data. Ofwat's approach of using 2023 actuals will therefore understate our costs with certainty. As well as introducing an expected loss of 10% of the increase (due to the proposed 90:10 sharing rate), this has significant within period financeability implications as Figure 24 shows.

[193] We note that when deriving the Rateable Value, the rental negotiation between the hypothetical retail tenant and landlord is assumed to take place two years before the hypothetical lease starts. For the 2026 valuation, the assumed negotiation date is 1 April 2024. Strictly speaking, only information that is available at 1 April 2024 may be used for the valuation, albeit there is precedent for the VoA to allow some ex-post updates for key regulatory publications. Therefore whilst we could have used our business plan figures (seeing as these were the best available evidence at 1 April 2024) for the 2026 valuation estimates, we have instead used the DD, which is arguably prudent.

FIGURE 24: OFWAT DD FINANCIAL MODEL, DASHBOARD TAB

	2025-26	2026-27	2027-28	2028-29	2029-30	5yr avg.
Business Rates Changes from DD levels £m, 22/23 FYA	(1.628)	21.040	21.040	21.040	37.219	£99m total
Original DD						
Adjusted cash interest cover ratio (Ofwat)	1.283	1.643	1.725	1.782	1.817	1.666
Adjusted cash interest cover ratio - (Alternative)	1.283	1.643	1.725	1.782	1.817	1.666
Funds from operations / net debt (Ofwat)	8.71%	10.01%	9.76%	10.05%	9.86%	9.70%
Funds from operations / net debt - (Alternative)	8.13%	9.18%	9.03%	9.16%	9.27%	8.98%
Gearing - Appointee	57.48%	55.69%	57.24%	55.37%	55.99%	56.31%
Revised with Business Rates impact						
Adjusted cash interest cover ratio (Ofwat)	1.297	1.478	1.557	1.611	1.526	1.503
Adjusted cash interest cover ratio - (Alternative)	1.297	1.478	1.557	1.611	1.526	1.503
Funds from operations / net debt (Ofwat)	8.76%	9.33%	9.05%	9.27%	8.58%	8.99%
Funds from operations / net debt - (Alternative)	8.18%	8.50%	8.33%	8.38%	8.00%	8.27%
Gearing - Appointee	57.45%	56.00%	57.87%	56.31%	57.47%	57.02%
Variance						
Adjusted cash interest cover ratio (Ofwat)	0.0	(0.2)	(0.2)	(0.2)	(0.3)	(0.2)
Adjusted cash interest cover ratio - (Alternative)	0.0	(0.2)	(0.2)	(0.2)	(0.3)	(0.2)
Funds from operations / net debt (Ofwat)	0.1%	-0.7%	-0.7%	-0.8%	-1.3%	-0.7%
Funds from operations / net debt - (Alternative)	0.1%	-0.7%	-0.7%	-0.8%	-1.3%	-0.7%
Gearing - Appointee	-0.0%	0.3%	0.6%	0.9%	1.5%	0.7%

Source: Northumbrian Water analysis

455. This shows that the projected business rates increases are material enough to cause our credit metrics to fail the BBB+/Baa1 thresholds. Moreover, the 90% cost sharing of the AMP8 overspend would increase customer bills in 2030/31 by over 8%. The proposals as set out in the DD are clearly not in the customer interest.

7.1.6. Proposed remedies to address business rates in the FD

456. For the FD we think there are two main options for Ofwat to address the issue by allowing efficient cost recovery and avoiding a large true up in AMP (which would be damaging for both our credit metrics and customer bill volatility).

457. The most straight forward solution is to use the DD or FD parameters to update the estimates of business rates. We have included these in our resubmitted data tables in line with the methodology discussed above. The 90% cost sharing would protect us and customers from deviations away from this but would avoid the expectation of a downside loss for Northumbrian Water and bill volatility for customers at the start of AMP9.

458. An alternative would be to introduce a within period adjustment similar to the approach Ofwat uses for ODIs, so that allowances can be adjusted during the AMP. The draft Business Rates bill for 2026/27 to 2028/29 will be known in December 2025, so a revenue adjustment could be made in 2026/27 with an adjustment in future years for any variance between the Draft and Final Charges. Another end of period adjustment would be needed to reflect the outcome of the 2029 revaluation. This would also allow companies to factor in any transitional relief that was allowed.

459. Either option would move Ofwat's approach closer to the established business rates cost pass through approach taken by Ofgem.

460. Within the data tables we have only included an uplift for water business rates and not for wastewater as it is less clear how wastewater rates will be treated under the VoA methodology. However, any mechanism introduced to address uncertainty over future rates should equally apply to wastewater, particularly given the large sums of enhancement expenditure required.

7.1.7. Frontier shift

461. The analysis to assess frontier shift using EU KLEMS data is well established at successive price reviews across several regulated sectors. The range produced by CEPA in its report (0.5%-1.2%) is reasonable compared to other sectors over a long time horizon. Indeed, the top end of the range is similar to the top end of the Economic Insight 'sensitivity' range in its report that we used in our business plan.[194] However both of these estimates are based on long run trends rather than those we have seen more recently.

462. We set out three key arguments why Ofwat's frontier shift is too high: the "productivity puzzle"; CEPA's recommendation that the frontier shift needs to be set in the overall context of base cost and service level challenge; and the mismatch between forecast real wage growth and the assumption for productivity improvement.

463. The first issue therefore is the impact of the so-called 'productivity puzzle' - where since the 2008 financial crisis, there has been a slowdown in UK productivity growth across the economy. However, CEPA and Ofwat both seem to assume that water productivity growth will return to long term trends despite slowdowns elsewhere. This appears at odds with CEPA's own report which says that:

> "Additionally, whilst it is recognised that UK productivity growth since the Global Financial Crisis has been weak relative to longer-term historic trends, in our view Ofwat is justified in aiming up within the EU KLEMS range because the "productivity puzzle" should not be fully reflected in the scope for productivity

[194] Frontier shift at PR24-05-04-23-STC (economic-insight.com), see Table 1 on page 12

> gains in regulated sectors where there is greater certainty of investment and longer planning horizons."[195]

464. This suggests that the productivity puzzle should not be "fully reflected", and so their best estimate would lie somewhere between the long run trend and the slower rates seen since the 2008 crisis. Instead, the impact of the productivity puzzle is not reflected at all in the DD assumption of 1%. In our view, it is highly unlikely that the water sector will be able to solely buck the trend seen in the wider economy of slowed productivity growth as our supply chain is comprised of companies in sectors that have experienced this slowdown.

465. The second issue to consider is identified by CEPA in its reports where it says:

> "When considering where the frontier shift challenge might sit within our range, Ofwat should take into account the level of ambition on cost efficiency and service quality that is implied by the price control 'in the round', to ensure that the frontier shift challenge is part of a stretching but achievable package."[196]

466. A key difference between PR24 and the other precedents highlighted by CEPA in its report is the level of ambition on service quality compared to other sectors. For example, we have calculated that for the PR24 PCs that are not driven by enhancement spend that the average stretch per year is 3.9%. This compares to, for example RIIO-ED2 (where the only ODIs with annual targets relate to interruptions) where the stretch from performance levels available at the time of the control was set are flat on average. This much narrower ODI package combined with less stretch in the PCs for RIIO-ED2 makes the delivery of a 1% per annum cost reduction target much more achievable. In water where there is a much broader PC and incentive package with much larger stretch it is not possible to achieve the same level of cost reduction. We think this comparison points towards a lower estimate of frontier shift for water.

467. Finally, the use of a 1% frontier shift is not consistent with the assumption of 0.5% per year real wage growth. In economics, real wage growth is expected to be driven by labour productivity improvements – Ofwat used this assumption to set the labour RPE at PR19, based off projected labour productivity improvements.[197] For PR24, Ofwat is assuming only 0.5% real wage growth which implies a much lower level of labour productivity improvement than at PR19 where an average of 1.2% per year was assumed. However, despite significantly reducing the assumed rate of real wage growth (and by implication the rate of labour productivity growth), Ofwat has not reduced the overall level of frontier shift compared to PR19. These assumptions are clearly not consistent with one another and further points to a lower estimate than 1% per year.

[195] Frontier Shift, Real Price Effects and the energy crisis cost adjustment mechanism (ofwat.gov.uk), see page 78
[196] Ibid, page 84
[197] PR19-final-determinations-Securing-cost-efficiency-technical-appendix.pdf (ofwat.gov.uk), Table A3.10 on page 212 uses the OBR long term estimate for labour productivity as the assumption for real wage growth in 2024/25.

468. Overall, we still consider that our business plan assumption of 0.8% per year is not only reasonable but highly challenging in the context of the wider economy productivity slowdown still persisting and a much more stretching and comprehensive set of performance commitments compared to other sectors. We ask that Ofwat reconsiders its position in this area for the FD.

7.1.8. RPE true up for chemicals costs

469. We see no downside in including an chemicals price true up for PR24 to ensure that companies can recover efficient costs and so that customers to do overpay if there is a reduction in prices. Two of the reasons for excluding the true up are erroneous in our view and are interrelated.

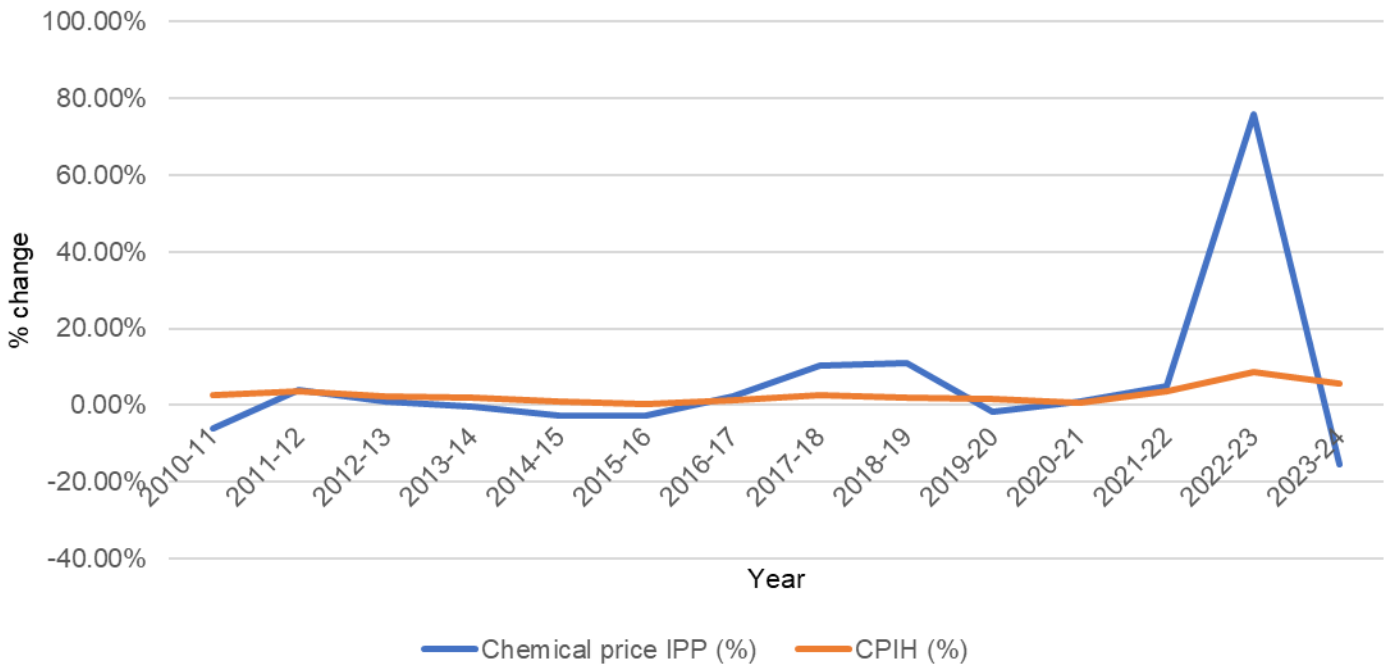
470. The DD states that:

> "The ONS chemicals price index does not significantly deviate from CPIH (long-term average RPE of 0.4%)"
>
> "In addition, the ONS chemicals price index, which is the best available independent index, covers a wide range of chemicals so is not a good reflection of water company chemical costs."

471. We do not agree that the ONS chemicals index is the best available index. As the DD sets out, it covers a wide range of chemicals, including petrochemicals for instance, that are not reflective of the cost pressures facing the chemicals we use.

472. Recognising this issue, we proposed a different ONS index in our plan which is the "PPI INDEX OUTPUT DOMESTIC - C2013 Other inorganic basic chemicals". It is a PPI like the index considered by CEPA and Ofwat but focusses on inorganic basic chemicals which is much more representative of the chemicals used by water companies. We plot the inflation of this index in the chart below.

FIGURE 25: OTHER INORGANIC BASED CHEMICALS PPI AND CPIH INFLATION



Source: ONS PPI index[198]

473. This index has been much more volatile than the wider Chemicals index and has a higher average RPE of 2.7% compared to the 0.4% stated by Ofwat for the wider ONS Chemicals index which helps demonstrate why a true-up is appropriate to remove the impact of this uncertainty.

474. We therefore recommend that Ofwat does include an RPE true up as suggested in our plan using the ONS "Other inorganic basic chemicals" PPI index.

7.1.9. Energy cost uplift and real price effects (RPEs)

475. We welcome the inclusion of an energy uplift in the draft determination. We consider some changes are required to the way the uplift is calculated.

476. The energy uplift should be calculated based on the most recent five years of data (2019/20 to 2023/24). We consider that using the latest five years of data is consistent with the period the efficiency challenge in the base cost model is derived from and puts emphasis on most recent data, which best reflects current energy prices in the market. Using a longer period for the calculation (as in Ofwat's draft determinations) results in a higher energy cost adjustment for companies. But we consider that consistently applying a five year time horizon rather than a

[198] PPI INDEX OUTPUT DOMESTIC - C2013 Other inorganic basic chemicals 2015=100 - Office for National Statistics (ons.gov.uk)

ten year time horizon better reflects the current state of the world. We discuss this issue further in section 7.1.11 below.

477. The uplift should be calculated using the most up to date data available at the time of the final determinations. This will ensure that the current prices faced in energy markets is taken into account when considering the energy cost uplift required.

478. We do not consider an ex-ante RPE adjustment should be applied, as was done in the draft determinations. As set out in our business plan, an ex-post adjustment to true up for actual movement in energy prices is necessary to protect customers and companies. But an ex-ante adjustment based on flawed forecasts is very likely to introduce distortions and potentially significant cash flow issues for companies.

479. We do not consider that the forecasts used to set the ex-ante RPE adjustment are appropriate because the forecasts used do not reflect the impact of companies' hedging strategies including those in the DESNZ index. Hedging is intended to reduce volatility in the price paid and so indexation that includes hedging costs will therefore protect both companies and customers. An appropriate publicly available forecast does not exist, and therefore we consider that the best approach – as we set out in our business plan – is to apply an ex-post true up alone, without an ex-ante RPE adjustment. This will ultimately result in companies receiving the same revenue (time value of money adjusted) but will avoid creating the cash-flow issues that the RPE proposed in the draft determination would. If Ofwat does wish to include an ex ante RPE adjustment then it should seek to adjust for the impact of hedging, as included in the DESNZ index, so that it does not result in a large expected true up at the end of AMP.

480. We have some concerns that the proposed index for the energy cost true-up does not take into account the cost of funding Contracts for Difference (CFDs) and therefore is not fully reflective of the energy costs we face. Large industrial users included in the index will be similar in some regards to water companies, but of these energy intensive users are not exposed to Energy Market Reform (EMR) costs including CFD charges to support renewable energy generation. Due to the planned increase in renewable generation, we would expect these charges – that we do pay – to increase over 2025-30 increasing the divergence seen historically between the different indices. The exclusion of these EMR costs from the index will result in the index exhibiting more volatility in prices than we will face, as CFDs act as a guaranteed price for generators – and therefore a more stable cost to customers.

481. We consider that the DESNZ non-domestic electricity price index[199] may better reflect CFD charges than the DESNZ industrial electricity price index[200] as the weighting of energy intensive users will be smaller in broader index and therefore more representative of the charges faces by water companies. We have requested but not

[199] Gas and electricity prices in the non-domestic sector - GOV.UK (www.gov.uk)
[200] Industrial energy price indices - GOV.UK (www.gov.uk)

received information from DESNZ on the make up of the customers included in these indexes to ascertain which would be the most appropriate index. We recommend that Ofwat discusses this with DESNZ to establish which is the most appropriate of these indexes to use for the true up so that it best tracks the energy costs of water companies during AMP8.

7.1.10. Environment agency discharge charges

482. Earlier this year the Environment Agency consulted on substantial increases to charges for water discharges to so that it could fund a step up in its monitoring and regulation of water companies. It decided to implement these proposals and these charges have been implemented for 2024/25 and will result in increased charges for the duration of AMP8.[201]

483. This increase in charges was not known when we submitted our plan and was therefore not included. The increases are predominantly for wastewater discharges and these EA charges are treated as modelled costs for wastewater. We therefore request that Ofwat provides an **industry-wide cost adjustment** for wastewater companies for these charges as otherwise they will not be recoverable.

484. We have set out below these increase in these charges which have been included in our updated DD version of the data tables. There was a delay in implementation of the changes so we did not get the full increase for 2024/25. These will be reflected in our charges for 2025/26 onwards which is why there is an increase between these years (that is, the increase is split between 2024/25 and 2025/26, there is not a second increase).

FIGURE 26: ENVIRONMENT AGENCY CHARGES FOR WASTEWATER

	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30
EA discharge charges (£m)	3.62	6.53	7.11	7.11	7.11	7.11	7.11

Source: Northumbrian Water analysis

7.1.11. The time period for assessing what base buys for the industry wide cost adjustments

485. For the adjustment to metering replacement, mains renewal and energy, Ofwat has used the full span of data covering the same period as the econometric models going back to 2011/12 to estimate funding from base. We do not think this is the right approach.

[201] Environment Agency consultation: charge proposals for water discharges - Environment Agency - Citizen Space (environment-agency.gov.uk), for consultation and statement that the proposals will be implemented.

486. The approach to calculating base allowances points towards using data from the last five years of the base cost modelling:

- The "predicted costs" from the base cost models use the entire dataset and an average of the activity over the whole period. If the sector were in a steady state and Ofwat used the predicted costs from the model to set allowances, then it would be reasonable to use an average since 2011/12.
- However, the sector is not in a steady state, and Ofwat does not set allowances at the predicted cost level from the model. Instead, it uses an upper quartile calibrated using the last 5 years of data. This means that the level of costs and activity in those 5 years is baked into the upper quartile benchmark.

487. This shows that a calculation based on the last five years is a more appropriate reflection of what is included in base expenditure allowances, as this has not been constant since 2011/12 – the same reason Ofwat has used this to set the upper quartile benchmark.

488. Like Ofwat, we think a common approach in this area should be applied to all three. In our plan, we assumed five years was the appropriate reference point for these assessments and continue to think this makes the most methodological sense.

7.1.12. Net Zero cost adjustment

489. Ofwat has made an adjustment to our allowed base costs of £2.102m for water and £2.394m for wastewater. The net zero cost adjustment is intended to enable companies to invest in the infrastructure needed to allow the adoption of low carbon technologies critical to the reduction of greenhouse gas emissions from the use of vehicles and heating.[202] We support this allowance, and Ofwat asked us to explain what we would do with this funding in our DD representations. We set this out below.

490. We tested the inclusion of a Net Zero enhancement case to support the decarbonisation of our fleet with customers during the development of our PR24 business plan. Customers told us that they did not consider this an appropriate area for enhancement expenditure and so we did not include this in our business plan.203 However, on 3 January 2024 the Zero Emissions Vehicles Mandate became law204. We have been told by our existing supplier that as a result of the mandate, they will review any vehicle order not in line with the annual targets for the proportion of electric vehicles (EVs) and will give priority to orders meeting the requirements. Due to the constraints on the supply chain for commercial vehicles, this effectively means we need to meet the required proportions of EVs in our orders – 16% in 2025 and rising to 70% in 2030. We will therefore need to

[202] 'PR24 Draft Determinations Expenditure Allowances', Ofwat, July 2024, pp.43-44.
[203] NES 45, Line of Sight
[204] Pathway for zero emission vehicle transition by 2035 becomes law - GOV.UK (www.gov.uk)

invest in charging infrastructure to enable the use of these EVs and so welcome the addition of the Net Zero base cost allowance.

491. As emissions from road vehicles and reductions in those emissions are captured by the proposed methodology for the greenhouse gas emissions performance commitments, we consider an adjustment to the targets to account for this additional cost allowance as proposed by Ofwat is reasonable. However, we disagree with the scale of the emissions reduction this funding will deliver – see section 8.13 Greenhouse gas emissions for details.

492. **We estimate that the proposed net zero funding will enable us to provide most of the charging infrastructure need to support the electrification of the first tranche of our light commercial vehicles.** To establish the cost of charging infrastructure to decarbonize our fleet, we commissioned Ennoviga Solar Limited (ESL) to examine our fleet to establish how many chargers we would need, where we would need them and what size they need to be. ESL built a model that used Geographic Information System (GIS) data for the trips each vehicle has made, vehicles specifications and our site information (where chargers could be placed). The model uses a hindcasting approach and calculates the suitability of a vehicle for electrification. The results show 283 of our 1005 light commercial vehicles (LCV) are reasonably well suited to electrification based on current technology.

493. The model then identifies what chargers would be needed on our sites to enable these journeys. The modelling approach is iterative, and we have added further constraints to remove chargers with low utilisation – with the cutoff point based on the additional cost of using public charging, including lost staff time.

494. Combining this analysis with assumptions about the cost of charging infrastructure, including an estimate of network connection costs, we have estimated the cost of the infrastructure to support these vehicles to be £4.7m. We therefore expect the £4.5m proposed allowance to cover approximately 96% of the cost of charging infrastructure needed for these vehicles. For further details see NES80C.

495. It is important for Ofwat to recognise that this is not a one-off cost. Once this charging infrastructure is in place it will need to be maintained and replaced, and we expect the asset lives for the charger unit to be relatively short (circa 5 – 10 years for chargers). A proportion of the installation costs will be for electricity network costs – for network connections and reinforcements – with longer lives, assumed to be 30 years. In addition, as this allowance will only fund part of the infrastructure we will need for current and future fleet electrification, we expect cost allowances for charging infrastructure to be revisited at PR29.

496. **We accept the requirement for companies to report on infrastructure spending relating to the cost adjustment in APRs.**

497. **We agree with the principle that if this funding is not used to deliver supporting net zero infrastructure it should be returned to customers, through an ex-post review at PR29. We have considered whether a PCD would be appropriate.** In this instance, we consider it would not, due to the relatively small size of the allowance,

and because of the complexities needed to define an appropriate PCD. A simple unit rate approach, while initially appealing, would not take account of the potentially variable and significant costs associated with provision of network connections and reinforcement at different locations. We would therefore suggest an ex-post review at PR29 would be the best approach to manage the risk of investment not being delivered for customers.

7.1.13. Other areas of feedback on base costs

498. There are a small number of other areas where have feedback on the DD proposals for base costs. We set these out below.

7.1.14. Base cost models

499. The approach to the base cost modelling largely follows what we included for our plan and so we are generally supportive providing that Ofwat acknowledges the limitations of these models, particularly in the area of capital maintenance where a backward-looking assessment does not reflect future investment needs. The needs and requirements from capital maintenance will need to increase in scope in future compared to historic averages, due to: aging assets; heightened resilience needs flowing from climate change; and changing legal and regulatory interpretations of existing (and in some cases, long-standing) legislation and regulatory frameworks.

500. For the FD, Ofwat should include the 2023/24 APR data in the models to ensure that it reflects the most up to date information.

501. As set out in our plan[205] and our response to the cost assessment consultation[206] we still have significant concerns over the use of the average pumping head (data quality concerns) and urban rainfall (engineering rationale concerns) concerns and do not think these concerns have been properly considered in the DD. We do not repeat those concerns here but would welcome further consideration and response to them in the FD.

7.1.15. Forecasts of the base cost model drivers

502. For two of the cost drivers used to derive allowance we think that improvements can be made to how these are forecast.

503. For the water resources plus and wholesale water models, Ofwat has used our forecasts of connected properties as they were lower than those derived by Ofwat. However, now that we have the data for 2023/24, we can see that our forecasts are lower and that Ofwat's own forecasts are more in line with our actual. For 2023/24, our forecast is 2,082,057, Ofwat's forecast is 2,096,824 and the actual figure is 2,094,202. Our forecast for water connected properties are rebased to 2021/22 which is in line with WRMP. We have used an ONS trend for

[205] nes04.pdf (nwg.co.uk), page 17
[206] https://www.ofwat.gov.uk/wp-content/uploads/2023/04/NES-Consultation-Response-to-PR24-Econometric-models.pdf

property and population growth in line with PR24 guidance. However, there was a big increase of 0.72% in properties in 2022/23 (c.0.5% in previous years) and this has not been factored into our forecast.

504. So, Ofwat should uses its forecasts instead of ours for this driver in the FD because Ofwat's forecast for 2023/24 is closer to our actual figure than our forecast.

505. For the wastewater models where load is a variable, we are concerned with how Ofwat has derived its own forecast because it has extrapolated from our final year of actual data. It is likely that at FD the starting point for Ofwat's forecast will be the actual figure for 2023/24. The problem with using the 2023/24 data as a starting point is that it was a much higher than average wet year, and this results in less load being measured for treatment (due to higher-than-average use of storm overflows). We report measured load rather than 'theoretical load' and so using this year in isolation for deriving our forecasts results in an underestimate of the likely loads we will have in AMP8. For 2023/24, our measured load is 171,776 (reported in APR) and theoretical load would be 187,804. The theoretical load of 187,804 is derived from resident population (census data where housing occupation rates are multiplied by the number of houses in the drainage area) and trade effluent. Resident population is converted to a load assuming 60g of BOD per person per day. The measured data method, although reflecting actual loads rather than theoretical loads, is highly variable as rainfall does impact the sample dataset. As a result, load and the dataset are inherently variable. To set a baseline using this data would not be appropriate as 2023/24 does appear to have been impacted by rainfall and therefore, unless adjustments were made, is likely to underpredict future loads. The theoretical load method offers a more consistent load value, around which the measured loads conform with over multiple years, and one which is suitable for use as a baseline. It is less likely to under or overpredict future loads.

506. So, Ofwat should use theoretical load for forecasting purposes.

7.1.16. Inflation indexing for the retail control

507. For retail costs we welcome the inclusion of inflation within the cost allowances but do not understand why Ofwat has not just indexed the controls to CPIH like it does for the wholesale areas. This would be a simple change to make and would remove the risk for customers and companies from inflation deviating substantially from the forecasts made in the price control.

7.2. ENHANCEMENT COST EFFICIENCY

508. Ofwat assessed our enhancement cost efficiency for the purpose of shallow dives in the PR24-DD-Enhancement-company-efficiency-challenge model. This provides a 0% challenge for water, and a 5% challenge for wastewater.

509. However, there is an error in the model. In the "wastewater enhancement" sheet, columns AL to AN, Ofwat includes assessed and allowed costs for IED, calculating an efficiency score. These assessed and allowed costs

are not correct. We did not include any request for IED enhancement in our business plan and we were allowed none.

510. Ofwat has used the numbers calculated from their assessment of efficiency in Table 24 of the enhancement cost modelling appendix. However, the column labelled "request" in Table 24 is not correct – this is the inputs to the models from the December 2023 IED cost submissions, which included our historic IED schemes to support Ofwat's cost efficiency assessment. We did not request £52.26m for IED; we requested no enhancement expenditure for this at DD (as confirmed by the inputs to the IED enhancement model).

511. The correct comparison for the shallow dive model is Table 26 of the **enhancement cost modelling appendix**, which correctly shows that we asked for no IED expenditure. Section 6.5 of the enhancement cost modelling appendix claims that the adjustment is because "companies funded in the 2020-25 period through the CMA redetermination will not receive an IED cost allowance at PR24 for investment that has been previously funded". It also speculates that we may have "made an early start on achieving compliance in the current price control period". This is very confused: we did not ask for any allowance, and we think it is a clear error for our information to be treated and described in this way.

512. The information for IED for Northumbrian Water in the PR24-DD-Enhancement-company-efficiency-challenge model should be updated to show zero assessed and zero allowed costs (matching our business plan submission). Making this correction shows that we have a total efficiency score of 100.35% for wastewater efficiency, and so would mean that shallow dives should apply a 0% challenge for wastewater.

513. Ofwat should then update this to a 0% challenge for each model that applies a shallow dive efficiency challenge.

7.3. WATER SUPPLIES

514. We have two concerns on the models used for WRMP supply: on the model for "Treatment" option types in PR24-DD-W-Supply-1; and on the treatment of interconnectors in PR24-DD-W-Supply-Interconnectors. We describe these concerns and provide new evidence below in sections 7.3.1 and 7.3.2. We also explain why we think the Bungay to Barsham pipeline should be treated as a supply interconnector and provide further evidence in section 7.3.3.

515. We broadly agree with Ofwat's approach on gated WRMP schemes, but we propose revised dates in section 7.3.4. We also explain how we have included our new WRMP supply schemes (as described in our letter to Ofwat in May 2024) and provide further evidence about our Kielder Strategic Resource option.

7.3.1. WRMP "treatment" option types

516. The unit cost model for "treatment" in the "unit cost model" sheet of PR24-DD-W-Supply-1 is not appropriate for all schemes that have been classified as base activity. These schemes range from upgrade of existing treatment

works (such as in the Severn Trent WRMP) to new and separate processes (such as the nitrate schemes in the Northumbrian Water and Anglian Water WRMPs). The variation in these schemes is why we see such a large difference between company business plans and allowances. The model already shows that unit costs for entirely new and separate treatment processes are the four highest (with a median of 7.24) and the unit costs for upgrading current treatment works to increase capacity are the four lowest (with a median of 2.64).

517. For our business plan, this results in about a 20% reduction across all treatment schemes – but this conceals estimates that are clearly not sensible, with for example our Langham nitrates scheme cut from £40.1m to £5.1m and our Langford clarifiers scheme increased from £8.8m to £45.7m. This is because these types of treatment are very different, from regular treatment processes such as clarification, to complex treatment processes such as nitrate removal. In the round, our treatment schemes were classed as relatively efficient (3.6% above the median cost benchmark). However, this seems to be just chance. This is not a sensible efficiency challenge, because this is not based on comparable schemes.

518. One improvement to the model would be to split out schemes which require entirely new and separate treatment processes (that is: Anglian Water, Northumbrian Water, South West and Southern) from those schemes which upgrade current treatment works to increase capacity (that is: Severn Trent, Thames, and Wessex) into two separate models. This provides much more sensible results for every company, with much more clustered unit costs.

519. This would avoid some of the most dramatic results of the model, such as increasing the cost allowance for Severn Trent's WTW expansion at Shelton from £43.6m in the business plan to £119m in the model.

520. The model also makes a challenge before the unit cost model is applied (in the "non-enhancement deep dive" worksheet), removing 20% or more from most projects to reflect Ofwat's view that some of this cost overlaps with base expenditure. It is not correct to do this before the unit cost model, because this means that in practice the cut of 20% to Anglian Water's CW8 costs is applied to all schemes (because they are the median company). To illustrate this, we can show that the different rates applied to Severn Trent's Shelton and Draycote schemes result in no difference to the cost allowances calculated from the unit cost model. As the unit cost model is looking at efficiency, it should consider the total cost of the scheme including both base and enhancement costs and compare these – otherwise it is not comparing like with like, and the comparison is not valid. Any challenge on base costs should then be applied **after** the unit cost model, to correctly allocate the efficient costs between the two.

521. Further to this, we think Ofwat has applied a standard 20% challenge to treatment solutions because they consider that some of this is always going to be base expenditure – simply saying that "this is because the provision of water treatment is included as a base activity and the company has not provided sufficient and convincing evidence to demonstrate how base activity is accounted for with these solutions". We asked Ofwat about this in query NES-005 and they explained that:

> "A 20% efficiency challenge has been applied to all treatment schemes across the industry due to a continued concern that treatment upgrade activities have a crossover with base activities. This is due to a general expectation that existing treatment processes, to an extent, are required to be upgraded or updated to manage some varying water quality conditions as part of base activities. The Northumbrian Water schemes have, however, not been challenged because of the evidence provided on the specific emerging and deteriorating water quality issues that the schemes address."

522. This does not seem to be a logical conclusion to draw, because there are quite large differences between entirely new and separate treatment processes (Anglian Water, Northumbrian Water, South West, and Southern) and schemes that upgrade current treatment works to increase capacity (Severn Trent, Thames, and Wessex). We showed in our response to query OFW-OBQ-NES-173 that our nitrate schemes were entirely new and separate systems at treatment works and would not be required if it were not for new WRMP supply requirements. We provided a full schedule of costs for each project, showing that none of these costs related to maintenance or upgrading existing assets.

523. In addition to this, these complex schemes are to provide additional deployable output and meet the supply demand challenges in these zones[207]. Having new treatment capability in these zones allows more raw water to be treated when levels of nitrate and cryptosporidium peak. We will see peaks in these contaminants in the raw water feeding these sites, and because there is no existing treatment capability that can tackle these contaminants this means we must switch raw water sources which reduce deployable output in the rest of the zone. Our WRMP shows that it is not possible to continue this approach because:

- Modelling shows that high nitrates and high crypto is forecast to increase to 2040, and so deployable output in the zone will reduce from these works as we are unable to treat some raw water sources at these works.
- Supply demand balance will be increasingly in deficit, so we need additional deployable output. That is, it is not sufficient just to maintain the existing output.

524. Ofwat goes on to say in its response to query NES-005 that:

> "We applied a 20% cost efficiency challenge where have identified a base activity overlap concern, rising to 30% for significant concerns across multiple areas. The evidence submitted by companies for why all the investment in maximising output from current assets or water treatment works has been poor. We expect that in general the cost of upgrading or expanding current assets would be less than requiring brand new ones, but in many instances, this is not the case in company submissions. We expect companies to evidence the base implicit which overlap with any upgrade activity. We reserve the right to review these assumptions for base overlap in the final determination."

[207] See our final WRMP, April 2024

525. Ofwat also assessed similar nitrate schemes for other companies under the raw water deterioration driver in their PR24-DD-W-raw-water-quality-deterioration model. In each case, they assessed this as meeting the criteria for enhancement investment and so additional customer funding. For Portsmouth Water, for example, Ofwat explains that "the need to add new treatment to prevent nitrate exceedance is outside base"[208].

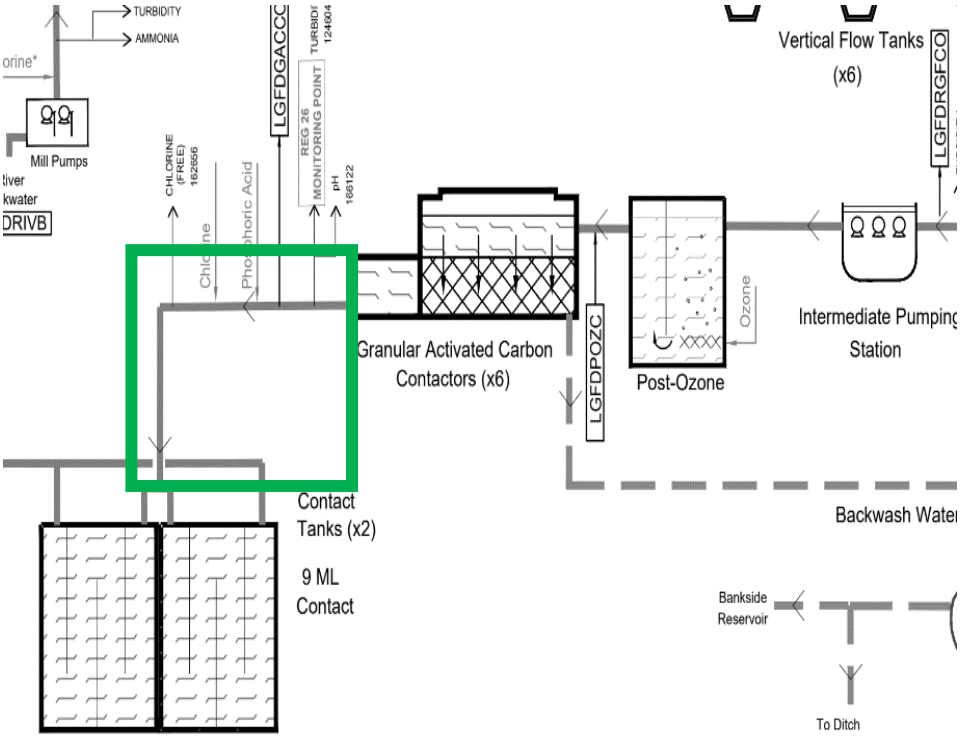
526. We can understand the application of a standard 20% challenge for schemes that upgrade current treatment works to increase capacity, because for these schemes companies should show what component of this relates to new water supplies under WRMP, and what component of this is the implicit allowance in base for replacing existing assets and upgrading these to new. This appears to be the concern that Ofwat has, about maximising the output from current assets or treatment works (which should have some base overlap).

527. This does not make sense for schemes where the entire treatment process is new, and so the scheme does not maintain or upgrade any existing assets and there are no additional benefits to water treatment capacity. Our treatment schemes do not upgrade or expand current assets, and instead require brand new assets. For the nitrate schemes in our business plan, the implicit allowance is zero.

528. This is illustrated in Figure 27 below, which shows (in green) the location of the new treatment process at Langford. We provided a full breakdown and schedule of costs in our response to query OFW-OBQ-NES-173, showing that none of the costs for the scope of these investments are related to the running, maintenance or upgrading of existing assets and therefore no allowance has been made for base.

[208] PR24-DD-W-raw-water-quality-deterioration model, PRT (NO3) sheet, row 13

FIGURE 27 - PROPOSED LOCATION OF NEW NITRATE TREATMENT AT LANGFORD



Source: NWL's schematic

529. Ofwat should consider the evidence individually for each company and compare this to its assessment under the RWD driver, rather than applying a blanket policy. In particular, this should only apply to those schemes that do upgrade current treatment works to increase capacity – rather than those that add new and entirely separate processes.

530. Further to this, we have undertaken some additional modelling to provide a further view on the benefit of the nitrate schemes for the Essex system. Our WRMP uses a dry year annual average benefit for WAFU, which is required under WRMP – and Ofwat uses this as the scheme benefit. We have used the Essex Water Resource Zone Aquator water resources model to provide a further view on the benefit of the nitrate schemes for the Essex Water Resource Zone. We did this by simulating water quality influence on river water availability using the Aquator water resources model and determining the impact on DYAA deployable output at the Water Resources Zone level. Using this approach, the WAFU benefit from the Langford nitrate scheme is 14.0 Ml/d, and the benefit from the Langham nitrate scheme is 4.0 Ml/d.

531. However, these benefits still represent an annual average. The costs of these schemes are more closely linked to the *critical* or peak demand, as this determines the appropriate size of treatment plant. To meet *critical* demand, our WRMP assumption is that the maximum deployable output at each WTW is always available. As such, the

anticipated design flows into the new nitrate treatment processes to achieve a blend which is compliant with the health-based nitrate standard are:

- Langford – 47Ml/d of the total 56Ml/d DO
- Langham – 33Ml/d of the total 55Ml/d DO
- Langford – 25Ml/d of the total 28Ml/d DO

532. The WAFU benefits when presented as annual averages are lower than critical period benefits because these schemes are only used for part of the year, and this significantly affects the benefits from these schemes. Using the DO associated with critical demand would be a better approach for these schemes, as they are being compared to capacity improvements for other water companies which would function throughout the whole year (so, those schemes will seem much cheaper for the benefits described).

533. It is important to note that the nitrate trend is deteriorating in both concentration (higher levels) and duration (more days where treatment is required), and so our use of the new nitrate removal technology will increase over time. This will increase the effective WAFU benefit. We can provide more evidence to demonstrate this if required.

534. Ofwat should consider if a higher benefit should be used for these schemes in the modelling, to reflect this important difference from capacity improvement schemes.

7.3.2. Supply interconnectors

535. Ofwat uses an allowance for supply interconnectors which is weighted between an outturn and forecast model. These models imply quite different sector totals in AMP8 (around 16.6% higher from the forecast model compared to the outturn model), and even greater differences for Northumbrian Water (£115.9m under forecast, and £84.3m under outturn, a difference of 37%).

536. In the enhancement cost modelling appendix[209], Ofwat observes that it is reasonable to triangulate between these models because the data shows similar unit costs (the same per length, and forecast costs are 3.5% lower per unit of length than the outturn costs). This is not the right measure to draw this conclusion, because this should imply that the forecast model provides lower allowance than the outturn model (and it is actually the other way around).

537. This is likely to be because of the issue Ofwat observes with most of the data coming from one company, Anglian Water. Ofwat says that they “consider this is not a problem given that: we are placing weight on historical data which should address some of the concerns around forecasts from a company having undue influence on modelled costs; and external benchmarks suggesting that cost forecasts are reasonable[210].” However, Anglian

[209] Enhancement cost modelling appendix, Figure 9.
[210] PR24-draft-determinations-Expenditure-allowances-Enhancement-cost-modelling-appendix.pdf (ofwat.gov.uk), p76.

Water's historic costs for interconnectors have noticeably higher unit rates (£/unit of benefit) to the rest of the sector (approximately £4.38m cost per unit of benefit, compared to £1.46m across other interconnectors). This drives the greater weight on benefit in the outturn model compared to the forecast model (that is, the coefficient for ln(benefit) increases and the coefficient for ln(length) decreases).

538. Using the outturn model therefore puts more weight on the benefit as a cost driver, and so provides lower allowances to water companies who have identified relatively lower benefits for WRMP interconnectors in WRMP24 compared to WRMP19 (or for resilience interconnectors). This outcome is to be expected because the interconnectors with a higher cost-benefit ratio were selected in the previous plan. Since the outturn model gives a much large efficiency challenge across the sector in general, it is important to be confident in the data behind this model and the overall understanding of why this is different to the forecasts before using it to challenge costs.

539. As we observed for nitrate schemes in section 7.3.1, the incremental cost of water in one water supply zone can be very different from another water supply zone even for the same company, as the challenges for new water are different, and different water sources have been used or are available. In general, low-cost solutions have been delivered and higher cost solutions for incremental water remains. This means that using a cost per Ml/d benefit is not appropriate because under WRMP, even the schemes with a higher cost and lower DO benefit need to be delivered. A model that uses mostly Anglian Water's (high cost per unit benefit) schemes from AMP7 will systematically overestimate benefit as a cost driver – and this goes on to unduly penalise companies who must select interconnectors in their WRMP with a high cost per unit of DO benefit (but are efficient based on unit cost per length).

540. This could be addressed by putting more weight on the forecast model, with the outturn model serving as a useful cross-check that the forecast model is broadly right. This is more likely to be a good reflection of the costs in practice, because whereas the benefit depends on the WRMP position for individual companies (that is, compared to viable alternatives), the length of the pipeline is more closely linked to actual costs (and is determined by the distance that water must travel to provide the benefits). Ofwat describes storage and pipe diameter as being in the control of companies, but in practice this is largely determined by the engineering practicalities of transferring water at pressure rather than choices made. Including these variables might support a more effective model to be developed.

7.3.3. Allocation of Bungay to Barsham scheme to resilience interconnectors

541. Ofwat allocated our Bungay to Barsham interconnector scheme to resilience, rather than a supply interconnector, and so has adopted a different set of criteria for assessment. This means that the assessment misses some of the work on options that was already done in the WRMP. In this section, we respond to Ofwat's deep dive with additional evidence.

542. In allocating this interconnector to resilience, Ofwat has used different criteria to that used for supply interconnectors. In particular, Ofwat says that:

> "Northumbrian Water submits the Bungay to Barsham pipeline scheme in its business plan as a supply interconnector. The company describes the scheme as an intra-zonal transfer rather than a scheme which provides a specific supply-demand balance benefit. As the scheme may provide wider resilience benefits to the company, it has been reallocated to Resilience for assessment.
>
> The company states that a significant supply-demand deficit is forecasted in the Essex and Suffolk Water Resource Zones that has highlighted the need for more investment to address these deficits and deliver the supply-side interventions described in the case. The needs case presented by the company is very general, although they state that it aligns with the company's long-term strategy (LTS) and their long-term WRMP target of ensuring sustainable water supplies.
>
> The company does not provide sufficient and convincing evidence for why this investment is wholly enhancement. It also does not provide any evidence to demonstrate that there are not any overlaps in needs case with WRMP and WINEP investments also being requested at PR24."

543. This interconnector is identified in our WRMP as being required to meet the supply/demand deficit, and so it is not clear why Ofwat thinks there should be evidence to demonstrate why this does not overlap with WRMP – or why a further needs case is required for this assessment in particular (and not for other investments in our WRMP).

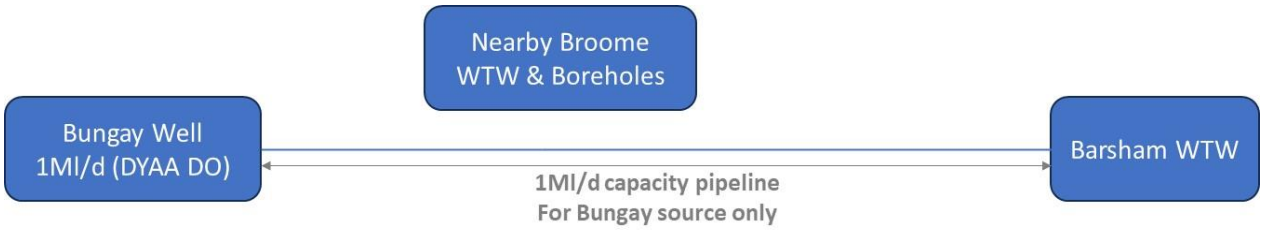
544. This should therefore be treated as a supply interconnector rather than a resilience interconnector. We demonstrated below that there is a small resilience benefit for this scheme, but the majority of the scheme is a specific supply-demand balance benefit. We think this reallocation is created by a misunderstanding from the description of this scheme as an intra-zonal transfer – it is true that this does not connect zones (so it is technically an intra-zonal transfer), but this is required to bring new groundwater from Bungay into use by transferring it to the Barsham WTW (which is capable of treating this water).

545. The Bungay to Barsham pipeline provides a supply enhancement of 1 Ml/d of new deployable output and is needed, along with other supply schemes in our preferred final plan, to address forecast baseline supply deficits as described in section 6 of our draft final WRMP24[211].

546. We accept that there is a small resilience aspect to this scheme. However, the majority of the scheme is about providing a supply enhancement and so this should be assessed as a supply scheme.

[211] Our WRMP

547. The schematic below illustrates the Bungay to Barsham pipeline:



548. There is no onsite water treatment works at Bungay and so the abstracted groundwater will need to be transferred via a new raw water pipeline (1Ml/d capacity) to Barsham WTW where we have capacity to treat the water. While the pipeline passes close by our Broome WTW, the Broome WTW process is not capable of treating the Bungay groundwater which is more influenced by surface waters. The new assets will provide 1Ml/d of additional deployable output and so this should be classed as a supply enhancement.

549. Given that the pipeline passes close to our Broome WTW, we have taken the opportunity to link in the Broome raw water main into the Bungay to Barsham pipeline for resilience purposes. This is illustrated in the diagram below.

550. To transfer the Bungay and Broome groundwater from Broome WTW to Barsham WTW, we have increased the pipeline from Broome WTW to Barsham WTW from 180mm to 280mm diameter.

551. The calculation for the marginal increase in cost for the resilience element is as follows:

- Bungay to Broome pipeline (180mm OD): £1,302.70/m
- Broome to Barsham pipeline (280mm OD):£1,466.75/m
- **Cost difference for Broome to Barsham pipeline:** 6,091 x (£1466.75/m – £1302.70/m) = £0.999m
- The marginal increase in cost is **£0.999m**.

552. This shows that this is primarily a supply interconnector, with around £1m of the total cost allocated to resilience. We have used the 1Ml/d supply benefit as the cost driver for this in our business plan (this is the driver for the remaining £12.828m of costs).

553. Ofwat sets out some concerns about whether or not this is the best option for customers:

> "We have some concerns whether the investment is the best option for customers. The company considers a narrow range of alternative options but does not provide sufficient and convincing evidence to demonstrate that the chosen options are best value for customers.

> The company states it has considered 64 water transfer options through its options appraisal methodology. However, the company provides limited evidence of the metrics and scoring used to determine the preferred plan and makes no mention of the 4Rs of resilience: resistance, reliability, redundancy, response and recovery.
>
> The company is also not providing sufficient and convincing evidence to demonstrate that the chosen option is the most cost beneficial in comparison to others. Therefore, it is not possible to determine if the proposal is the right solution."

554. We explained our options appraisal and preferred final plan decision making process in NES14 A3-01 WRMP SUPPLY OPTIONS[212] and our draft final WRMP. There are two reasons for the narrow range of options that Ofwat describes in their deep dive. The first is that East Anglia is a serious water stressed area and so traditional sources of water are either not feasible or have a very long lead in time before the deployable output benefit is realised. In summary:

- **New groundwater sources:** There is no groundwater available for licensing in our supply catchments except for the South Essex catchment where we are developing the Linford WTW through the Accelerated Infrastructure delivery programme. Aquifer Storage and Recovery (ASR) was discounted as a feasible option.
- **Surface water sources:** There is only limited surface water available for licensing at high flows which therefore require winter storage reservoirs. We are progressing the North Suffolk winter storage Reservoir, now through the large scheme gated process, and subject to Ofwat's final determination, intend to investigate a further winter storage reservoir in the Norfolk Broads area, also through the large scheme gated process. However, both these reservoirs will take over 10 years before their deployable output benefit is realised.
- **Imports:** We investigated imports of water from Anglian Water, although these were discounted because they will not have surplus resource to export as they will need all the deployable output from their own new supply schemes either for themselves or other water companies.
- **Water (i.e. effluent) Reuse:** We have considered a number of schemes and Lowestoft Reuse and Caister Reuse are in our preferred and Habitats Regulations adaptive programme respectively.
- **Desalination:** We have considered a number of schemes although none were selected for our preferred final plan. Even so, we have asked Ofwat for enhancement funding for the design of a scheme to allow a bulk import from Anglian Water as supported by its Bacton Desalination scheme. This scheme was not going to be delivered until the 2040's although given Habitat Regulations sustainability reductions, has now been brought forward. This has meant it is now a feasible option for us, thus the request for enhancement funding. We suggest that this is also delivered through the large scheme gated process (see paragraph 944).

[212] nes14.pdf (nwg.co.uk)

555. We considered the Bungay to Barsham Pipeline against all feasible options. Our EBSD Least Cost model and Best Value assessment have selected this scheme because it is feasible and can be delivered earlier than the Lowestoft Reuse and North Suffolk Reservoir. This is important as the DO benefit from the scheme will allow us to implement abstraction licence sustainability reductions earlier than would otherwise be the case.

556. Ofwat states in its draft determination that we have not made reference to resilience and the 4Rs (resistance, reliability, redundancy, response and recovery). While the main driver for the Bungay to Barsham pipeline is to provide 1Ml/d of supply benefit (that is, enhancement), we describe above how we have taken the opportunity to add a resilience element to this scheme, marginally increasing the size of the pipeline from Broome WTW to Barsham WTW, so that Broome WTW can be transferred to and treated at Barsham WTW for resilience purposes. We summarise the benefits of this scheme in the context of the resilience 4Rs:

- **Resistance:** The scheme will prevent disruption to our customers should, for example, we have a burst on an ex-Broome WTW treated water main or reduced output at Broome during a critical period. Marginally increasing the size of the main from Broome WTW to Barsham WTW means the water could be treated at Barsham maintaining a resilience supply to customers in the Northern Central Water Resource Zone.
- **Reliability**: As above.
- **Redundancy**: Marginally increasing the size of the main from Broome WTW to Barsham WTW provides a backup as it will allow Broome WTW raw water to be treated at Barsham WTW where we have spare capacity. In summary, the scheme will enable operations to be switched or diverted to alternative parts of the system in the event of disruption to ensure continuity of service.
- **Response and Recovery**: The scheme will enable a fast and effective response and recovery to be made to any issues at our Broome WTW or on the outlet treated water main while still maintaining supply to our customers.

557. Ofwat also raises some concerns about cost efficiency:

> "We have some concerns whether the investment is efficient. The company does not provide sufficient and convincing evidence that the proposed costs are efficient.
>
> "The company states that its costs are developed using their proprietary cost assessment database of historical investments. However, the company does not provide evidence of cost benchmarking or external assurance of costs to demonstrate that they are efficient.
>
> "We have found the costs for the proposed interconnectors scheme to be inefficient when applying the costs, pipeline lengths and benefits in our supply interconnector model. The company is not providing sufficient and convincing evidence to explain this difference in costs."

558. Our WRMP supply options enhancement case (NES14) does provide evidence of cost benchmarking. Table 37 of NES14 shows the "Barsham to Blyth Transfer Main" benchmarking evidence. Section 4.2.1 of NES14 explains

how we have benchmarked our estimated costs against six comparable water and wastewater companies from England and Wales, to show that these are efficient.

559. We also explained that we had external assurance of costs on this enhancement case by Mott MacDonald (we included a note from them on cost assurance as NES68 in our business plan). This report notes that they included this project (under "Raw Water") in their benchmarking, concluding that our costs are generally in line with or under the sector benchmarking costs.

560. The reason why this scheme seems inefficient when applying the costs, pipeline lengths and benefits in the supply interconnector model is because the 1 Ml/d benefit is very small in comparison to other schemes – and unlike "true" interconnectors that only provide resilience between zones, the benefit from this scheme is limited to the output from Bungay (at 1 Ml/d) rather than the maximum capacity of the pipeline. As we show above, a better proxy for the capacity of the pipeline is 2.57 Ml/d, as this is a better comparator with other pipelines (and so is a better representation of the cost driver).

561. Including this benefit of 2.57Ml/d in the supply interconnectors model instead pushes the modelled allowance up to £11.65m – that is, close to our business plan totex of £13.83. This is assessed at a similar level of efficiency as our supply interconnectors in section 7.3.2. In that section, we describe some limitations of the model's reliance on historic data from one company – and why changes could improve this model.

562. Finally, we note that our original business case missed some of the cost of the Bungay to Barsham scheme – which we have now included in our revised business plan tables. We explained this and our approach in our response to query OFW-OBQ-NES-192.

7.3.4. WRMP supply schemes and gated process

563. Ofwat's draft determinations set out a **gated process** for our Lowestoft reuse and North Suffolk reservoir projects. This is similar to our business plan proposal for an uncertainty mechanism, except the full costs have not been included within the price controls for either project – only the costs to complete the detailed investigations and design (as considered already through Ofwat's accelerated delivery programme). We broadly agree with this approach, but we ask for two changes – firstly, we now need to add new projects to this because we have been asked to do more in WRMP; and secondly, the timetable for the gated process does not align with the timetable already set out for the accelerated delivery programme.

564. We wrote to Ofwat in May 2024, and explained that we are now required to carry out additional detailed investigations and design for three new schemes so that construction could start from January 2028 (we discuss this in more detail in section 938). These schemes are: **Caister reuse**; the new **Trinity Broads winter storage reservoir**; and a connection to Anglian Water's **Bacton desalination plant**.

565. We do not have the final decision on our WRMP, and we expect this in October 2024 (before the FD). We have made cost estimates of the total size of the new schemes, based on comparable schemes that we have much more detailed evidence for (that is, our proposed North Suffolk winter storage reservoir and our Lowestoft reuse plant, where we have developed these schemes further under the **accelerated delivery programme**). However, these costs will not be improved until we have started more detailed design. We note that we do not yet have detailed feasibility or concept design for these options as they have been introduced at such a late stage into the WRMP process and were not needed under the original constraints. We will then need to carry out detailed design and planning activities – similar to our work on the North Suffolk winter storage reservoir and Lowestoft reuse schemes.

566. We have included £21.0m in our business plan in 2025-26 and 2026-27 to carry out these detailed design and planning activities, based on the same approach Ofwat has taken for our existing projects in the draft determination. This aligns with the timing for our accelerated schemes, where detailed design and planning must be completed by 31 March 2027.

567. We then expect that we would be able to make these decisions around June 2027 alongside our decisions about our accelerated schemes, with final decisions in December 2027. This is at the same time as draft WRMP29, so allowing us to carry out full modelling of future supply and demand forecasts. Construction would then need to start from January 2028.

568. In our letter to Ofwat in May 2024, we said that:

> "This timing requires either an uncertainty mechanism set at PR24 with decisions about price control modifications to be made by Ofwat in 2027, or a commitment to an accelerated delivery mechanism that allows additional work to be done from January 2028."

569. The gated process could serve this purpose, but Ofwat has set out a timetable which would make draft decisions by late summer 2026, followed by a consultation and conclusion by December 2026[213]. Ofwat goes on to say that:

> "If a company considers the gate deadlines cannot be achieved for certain schemes, we expect the company to provide compelling evidence in representations and propose an alternative timeline. We would then consider including the scheme in a separate process that could be run to conclude in 2027".

570. We propose a timetable that runs **one year later** than Ofwat's gated process – that is, submissions by 31 July 2027 (with draft decisions three months later, followed by a consultation and conclusion by February 2028). This is because the accelerated delivery process has already set out a timetable for delivery of the development stages by March 2027, which would of course not be complete in time for submission in line with the standard

[213] Ofwat **DD Expenditure Allowances appendix**, p181.

gated process in May 2026. We explored if it would be possible to bring this forward to meet the standard timeline for the gated process but concluded that this is not possible because there is significant engineering complexity; there are environmental monitoring/geotechnical investigations/environmental impact assessment required, with a long lead time; and uncertainty about how quickly a development consent order could be secured.

571. We expect that the North Suffolk reservoir might take longer than this, as the EA's Habitats Regulations have progressed and one outcome of this is that the Hands-Off Flow (HOF) condition for the new River Waveney intake (which would fill the North Suffolk Reservoir) will be significantly higher than previously agreed. This means we would need to investigate larger reservoirs with a storage capacity of up to 30,000Ml. This will have a significant impact on the timescales and may mean that Gate 3 needs to be later than 2027. In this case, the reservoir would likely not be required until 2040 and so this will not delay construction.

7.3.5. Kielder Strategic Resource option

572. We accept the reduction in the development cost benchmark from 6% to 5.5% and have updated our cost tables accordingly. We have also reprofiled our forecast expenditure so that 10% is allocated to Gate 2 and 90% of expenditure is allocated to Gates 3 and 4, in line with the DD.

573. We note that Ofwat has set the DD allowance based on the Yorkshire Water transfer option progressing after Gate 2, with all activities stopping for the transfer to United Utilities. Our understanding is that should the Kielder to UU transfer become a feasible option, then expenditure allowances would be adjusted at the end of Gate 2.

574. We note Ofwat's decision to disallow some early development costs and its position that these should be funded from baseline allowances. We confirm that we have revised our cost tables and these no longer include expenditure for Gate 1 tasks although as described above, expenditure is included for Gate 2 activity.

575. We understand, and welcome, that the deliverables of Gates 1 and 2, while yet to be confirmed by RAPID, will be lighter touch compared to the AMP7 round of SROs. However, all Gate 2 activities should be allowed for as enhancement because:

- The Kielder to UU Transfer is not included in any water company or regional plan preferred or adaptive plan because there are many other options with lower unit costs (the Kielder to UU Transfer was considered through the regional reconciliation process). However, the three water companies have included the Kielder to UU Transfer within the scope of the Kielder SRO at the request of RAPID (re-emphasised at meeting on 14 December 2023) as RAPID believes the scheme may be needed albeit in the longer term. Although the SRO will investigate transfers to the Water Resources West and Water Resources East regions, we consider that it is unlikely that they would be feasible options given the regional reconciliation process has not selected them. Consequently, we consider the Kielder SRO should be treated differently and that a reasonable approach would be to provide a Gate 1 enhancement funding allowance in this case.

- The Kielder SRO is a complex strategic study which we consider has a scope over and above the WRMP24 process for which we have a base allowance. The SRO will investigate multiple transfers including a) the Kielder to UU transfer; b) the Tees to Yorkshire Water Transfer; and c) transfers to other regions including WRE. The complexity arises from the need to consider impacts within and across regions as well as for competing needs for Kielder water and particularly in relation to the growing industrial demands (potable and raw) on Teesside. Further complexity arises from the uncertainty around the outcomes of WINEP investigations, both for Northumbrian Water in relation to target flows on the Tyne and Tees and for Yorkshire Water in relation to sustainable levels of abstraction on the River Derwent.
- RAPID has asked that all three types of transfers are investigated under the one SRO. An alternative approach would be to split the SRO into at least two SROs with separate expenditure allowances allocated. However, we believe that there will be efficiencies from delivering as one SRO for example in planning and procurement and ask that this is recognised through the provision of Gate 1 funding.
- Gate 1 is an important part of the wider regulated process and will require additional assurance, governance and regulator engagement including with the National Assessment Unit (NAU), all of which will require funding.
- Gates 1 and 2 of the SRO will involve three water companies including Northumbrian Water, Yorkshire Water and United Utilities. This will require dedicated teams in all three companies to be in place for Gate 1. Given the low likelihood of the Kielder to UU scheme being progressed to Gate 3, this is a significant additional cost from the start of the SRO process. Additionally, Gate 1 will incur mobilisation costs in terms of MoUs, procurement etc.
- We have adjusted our cost tables and are requesting £5.1m (<10% of total costs) for Gate 2. This is greater than allowed for in the draft determination. However, the Kielder SRO is complex (i.e. multiple water companies, multiple transfers) and will require significant engagement with the Environment Agency, Natural England and RAPID National Appraisal Unit engagement, all of which will need to recover their costs through the SRO. We have also reviewed the Gate 2 costs of the AMP7 Severn to Thames Transfer (STT) SRO as a comparator as it has similarities with the Kielder SRO with both having three water companies involved and both investigating inter-regional raw water transfers. The Gate 2 costs of the STT were circa £7m, significantly more than the £5.1m the three water companies are requesting for Gate 2, and significantly in excess of the level of investigation that would be done through base allowance via the WRMP process. Significant STT's Gate 2 out-turn costs included £1m for Programme Management (full time programme manager, tripartite governance and assurance etc), £0.5m NAU funding, £1.6m for environmental monitoring (well in excess of the £0.72m allowed for the Kielder SRO), and £0.5m for legal and procurement. With inflation, these costs alone total circa £4m. Consequently, we consider a Gate 2 expenditure allowance of £5.1m to be justified.
- We believe that the Kielder SRO meets the requirements for preparatory funding which Ofwat has set out in PR24-and-beyond-Final-guidance-on-long-term-delivery-strategies_Pr24.pdf. The table below summarises our assessment of compliance with the stated principles.

FIGURE 28 - ASSESSMENT AGAINST OFWAT PRINCIPLES

Ofwat principle	NES assessment
The scheme should be connected to an alternative adaptive pathway set out in a long-term delivery strategy to meet a defined externally driven uncertainty	As stated above, Kielder SRO is not linked to an adaptive pathway but RAPID has asked NWL, YW and UU to include this SRO in their respective business plans.
The scheme requires a material enhancement allowance and has a long lead-in time to develop and deliver, which covers more than one price control period	We consider the Kielder SRO to have a long lead in time because: The programme spans two AMPs with Gates 1 to 3 being completed in AMP8 and Gate 4 in AMP9. The total cost of the Tees to Yorkshire Water Transfer is approaching £1 billion. The outcomes of the SRO will feed into WRMP29 and WRMP34. The Tees to Yorkshire Water Transfer must be delivered by 2040.
The preparatory investment in the scheme in this price control period is better value for money than delaying the investment until there is certainty of need in a subsequent price review period	The Tees to Yorkshire Water Transfer element of the SRO cannot be delayed as the outcomes necessarily need to feed into the WRMP29 which will determine whether it remains in Yorkshire Water's (and NWL's) preferred final plan. However, the Kielder to UU Transfer could be delayed given it has not been selected in a preferred or adaptive plan. However, RAPID has asked that we progress this scheme as it believes it's better value to progress it in AMP8.
The scheme is the best option to meet the need and the proposed funding allowance is efficient and appropriate for the preparatory work	The Tees to Yorkshire Water Transfer element of the Kielder SRO is considered a best option for Yorkshire as demonstrated by it being selected for inclusion in its preferred final plan. The Kielder to UU Transfer is not considered a best option but RAPID is still keen that it is investigated through the Kielder SRO in case this position changes in the future (e.g. if a current preferred scheme is discounted in the future).
There is appropriate customer protection in place to ensure that the preparatory work is progressed	We consider Gate 1 to be low risk for customers given it is the start of the SRO process and because it is of lower value compared to expenditure on subsequent gates.

Source: Northumbrian Water analysis

7.4. WATER DEMAND

7.4.1. Leakage

576. We welcome Ofwat's policy in the DD to treat expenditure to improve leakage as enhancement. The improvements required to meet future targets cannot be funded from base so it is important that sufficient funding is provided. Whilst we are generally supportive of the approach, we think there is a need to revisit the approach that it has adopted to calculate the unit cost for leakage reduction for "Other leakage". This is because Ofwat only has chosen to look at costs in 2 years of the historical data sample (when unit costs are lowest) due to "the weather in these years being less extreme". We do not think this approach is justified and will result in a unit cost that is not representative of efficient costs in AMP8.

577. Ofwat has only relied upon data for 2019/20 and 2021/22 for calculating the efficient cost of leakage reduction on the grounds that weather in these years is less extreme. Ofwat does not present any data or analysis to support this assertion. We do not think this decision is justified.

578. Firstly, we don't think that the other years contained in the data sample from 2017/18 to 2022/23 are extreme in a historical context. We have undertaken the following analysis to assess how extreme these years are:

- We downloaded data for mean monthly temperatures for central England from the Met Office[214] as being representative of temperatures in in England and Wales.
- Using data going back to 1990 (to give a reasonably long time series) we then calculated the 5th percentile (P5) for temperatures during each of the winter months (December, January and February) and the 95th percentile (P95) for the temperatures during each of the summer months (June, July and August). This provides an indication of what goes beyond a 1 in 20 extreme temperature which can cause issues with leakage.
- We then compared data from the years 2017/18 to 2022/23 against these P5 and P95 values for the summer and winter months to see how many fell outside this range. The results revealed that zero winter months had mean temperatures below the P5 and only one summer months had a mean temperature above the P95. This summer month was in July 2018 with a mean temperature of 19.3 degrees centigrade versus a P95 for July of 18.74. Only 2006 had a hotter July going to back to the year 2000.

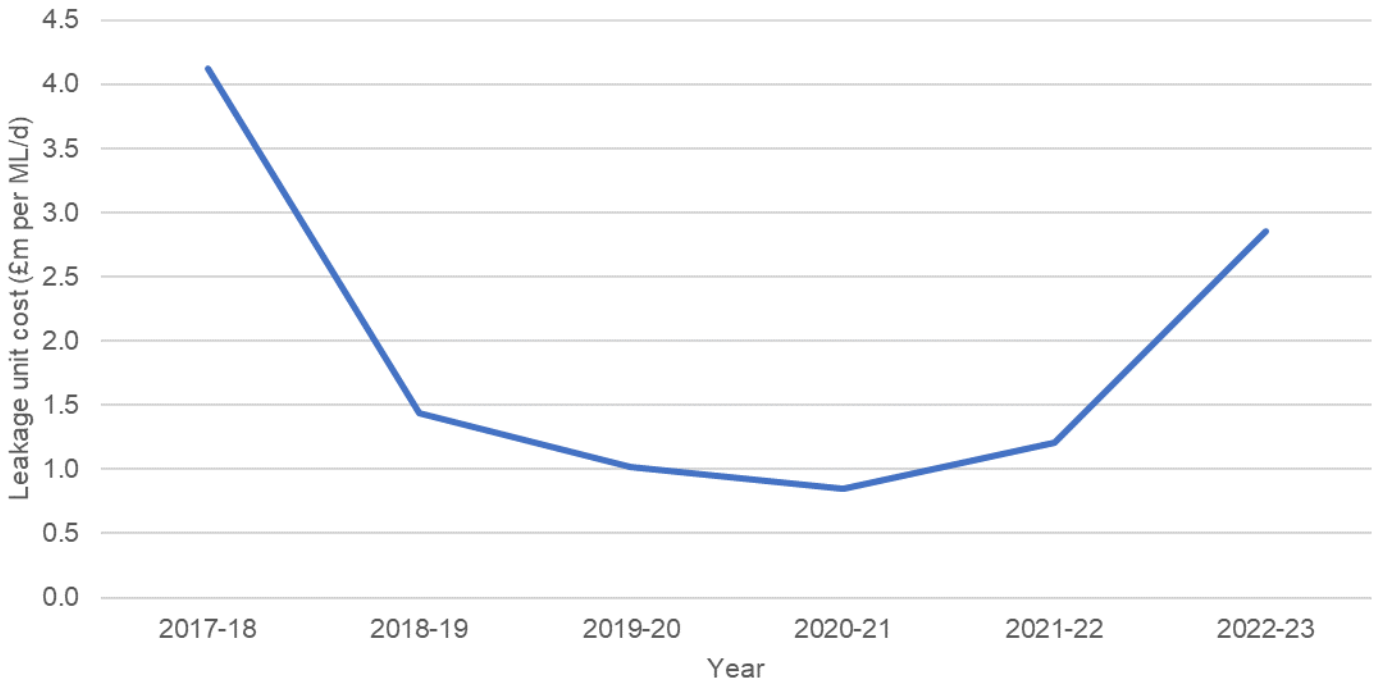
579. This result is not surprising. The period from 2017/18 to 2022/23 is six consecutive years with 18 winter months in total and 18 summer months in total. The fact that 1 out of these 36 months breached a 1 in 20 threshold is consistent with what we might expect from a distribution of temperatures. This analysis therefore does not suggest that the 2017/18 to 2022/23 period as a whole is "extreme". We do not see a reason why only a subset of the data for leakage should be used.

580. Secondly, there is no reason to expect weather in AMP8 to be fundamentally different from the period 2017/18 to 2022/23. There will be years with high and low temperatures as you would expect. It is therefore important that the period used to calculate the leakage unit cost is as representative as possible so that it can reflect likely future costs. Just focusing on years with more benign weather and lower unit costs would not achieve this and it is therefore important that years with good and bad weather are used. Moreover, following a bad year for leakage due to the weather there is normally a 'good year' in the sense that the leaks created, for example by a large freeze thaw event, can be fixed relatively cheaply compared to a year where leakage is already relatively low. This is another reason why leakage reduction costs must be considered over a longer period that just two favourable years.

[214] metoffice.gov.uk/hadobs/hadcet/data/meantemp_monthly_totals.txt

581. We have plotted below the annual unit costs of leakage reduction using the same calculation approach as Ofwat (which does not use data where leakage did not improve) to show the impact of considering the full time period.

FIGURE 29: LEAKAGE UNIT COSTS (£M PER ML/D) USING THE DD APPROACH TO CALCULATING UNIT COSTS



Source: NWL analysis of Ofwat DD data

582. We can see from the chart that the two years selected by Ofwat are among the lowest in the sample with an average of £1.1m per ML/d reduction whereas over the full sample of data the unit cost is £1.9m per ML/d reduction. This unit cost for 2017/18 to 2022/23 still represents a sizeable cost challenge to the median £3.2m per ML/d reduction included in companies' business plans.

583. For the reasons stated in this section we think that using the full period of data is much more representative of the efficient unit costs likely to be faced in AMP8.

7.4.2. Metering

584. On the approach to metering in the DD we have 3 overarching areas of feedback that we would like Ofwat to consider ahead of the FD:

- For **enhancement costs** we think the modelling of new installations is not sophisticated enough to capture differences in efficient costs between companies. In particular, external installations are more costly than internal installations; but external installations provide greater leakage benefits. Ofwat's approach to

modelling encourages internal installations which will forgo these leakage benefits. We discuss this further below.

- For the **metering replacement cost adjustment**, we provide our feedback in section 7.1.11.
- For the **metering PCD**, we do not think this has been specified appropriately in relation to levels of connectivity and levels of completeness in data reporting. We discuss this further in section 7.4.3.

585. The enhancement model for new meter installations treats all installations the same and does not distinguish between their characteristics in any way. One of these key differences is the meter installation location. New external installations will require excavation as there is no metering infrastructure already in place at the property. Compared to an internal installation (requiring no excavation), the costs will be higher. Ofwat's model does not distinguish between these types of installations, so a company favouring external installations (such as Northumbrian Water) will appear inefficient even if our costs represent market prices for these installations. However, the higher costs associated with external installations do provide additional benefits in terms of identifying supply pipe leakage - which an internal installation would not.

586. There is therefore a risk that overall companies will not be able to fund the efficient mix of metering and leakage activities if the enhancement model assumes all companies have the same mix of installations. By contrast, there is no equivalent challenge on the volume of leakage improvement required from enhancements – this means that companies favouring internal meter installations get more favourable treatment from the DD as they can claim the additional leakage reduction required from leakage enhancements, whereas companies adopting external metering strategies will either have to make up the cost shortfall of the external installations, or switch to internal installations and meet the cost of additional leakage reduction from other means.

587. To address this unequal treatment, we suggest that Ofwat either:

- Takes account of the proportion of external versus internal meter installations in the cost model; or
- Allows companies with external-first metering policies to make additional claims for leakage reduction from enhancement expenditure to make up for the shortfall from only funding a lower level of external meter new installations.

7.4.3. PCD for metering

588. We accept Ofwat's PCD rates and incentives, and these do provide an incentive to deliver the programme on schedule.

589. However, we do not think the standards for levels of connectivity and levels of completeness in data reporting are correct. These are for an active meter to:

- Measure and record water consumption data at least once an hour with a 95% or higher success rate.

- Transmit the recorded consumption data to the smart infrastructure network at least once every 24 hours with a 95% or higher success rate.[215]

590. Firstly, we have many meters that are not immediately connected to the smart network. In the North East we have customers who opt for a meter (or a meter replacement is needed as the current meter is not functioning). Although we install smart meters in the North East in these cases, it would not be sensible to install our smart network infrastructure everywhere in the North East in AMP8 in order to obtain this connectivity immediately (as it is not cost beneficial in areas where there are only a few smart meters). Most smart meters installed here will not be connected to a smart network, and so would not meet the requirements of the PCD. This is also the case across areas in Essex and Suffolk where we have not yet rolled out universal smart metering, but there are still those who choose to opt for a meter.

591. However, we should still install smart meters because – within the lifetime of these meters – these smart networks will begin to come online; and the data is still readable. It would not be sensible to continue to install non-smart meters. We still see the majority of the benefits from metering, even before these are connected to the smart network.

592. Secondly, a proportion of smart meters that are installed in areas that have smart networks already do not come online immediately. For example, there are some sites which are “dark” and have no communications. Our trials show that within a year, we expect that up to about 92% of smart meters are connected to the network (in areas where this is available) – and this hasn’t increased month-on-month. It is unlikely that we can increase this above around this percentage without installing disproportionately expensive network equipment, and even then it might not be possible to reach 100%. We note that energy smart metering has similar challenges, with electricity smart meters reaching about 92% of meters in “smart mode” for the first time in 2024; and gas meters reaching around 84%[216].

593. Under the requirement for connectivity and completeness in Ofwat’s DD, all of these meters would be counted as not delivered as they will not be connected to the smart network immediately on installation. This is clearly not reasonable. Ofwat could address this issue by modifying the definition so that it counts meters installed but not successfully connected to the smart network as delivered in the PCD.

594. Once these meters are connected, the requirement for a 95% success rate is too high. We understand that this has been taken from the upper point in a supplier’s quoted range for success – however, we note that in practice suppliers are overly optimistic and can sometimes exclude meters that have failed several reads (which Ofwat’s proposed PCD does not). A 95% success rate is a higher standard than in current contracts and will drive increased supply chain costs and water company costs than allowed for in draft determinations. From discussions

[215] DD, PCD appendix, p88
[216] Time series created from DESNZ annual reports, such as Q4 2023

with the industry smart metering group, we understand that there is evidence to suggest that this level of connectivity can drive shorter battery life and so higher costs.

595. We do not have enough data yet to propose a lower (but realistic) standard for connectivity, as we only began smart metering in AMP7 (but we understand from industry groups that this is around 89.8% for connectivity and 84.7% for completeness). We understand that MOSL has told Ofwat that they would anticipate that wholesalers would fail this standard from the outset and on an ongoing basis.

596. However, even if Ofwat were able to set a lower standard for connectivity, a penalty of this size for not meeting connectivity requirements seems excessive. This would effectively remove all of the funding for installing the smart meter, leaving companies with a potentially very large cost shortfall. Companies that were then able to improve "failed" meters to meet the standards in future periods would then expect to ask for this enhancement funding again when these met the standards (as they would not have otherwise had the funding to do this in their price controls).

597. Ofwat should remove these requirements entirely from PCDs, as this is complicated and will likely lead only to downside risk even for companies that deliver their metering programme in full. If Ofwat does want to incentivise high connectivity for smart meters, it would have been sensible to work with the sector to develop standards; address the barriers to this (including those listed above); and then to set incentives that are proportionate (rather than removing funding entirely after the meters have already been installed).

598. If Ofwat does continue to have these requirements as part of the PCD, it should modify the definition so that meters are only assessed for connectivity once they are connected to the smart network. Otherwise, as we explain above, there will be many meters that will not meet the standard for very valid reasons – even though the majority of the benefits from smart metering (and all of the benefits described in our business plan) are delivered.

7.5. LEAD REPLACEMENT

599. Ofwat's draft determination showed that our plan for lead replacement was efficient. However, Ofwat did not look at ambition and pace of investment. Since the business plan, the DWI has commented on the level of ambition across all companies, noting that this would need to increase substantially in future to meet long-term targets.

600. We provided evidence in our enhancement case NES20[217] that customers supported a higher level of investment in **lead replacement** and are willing to pay for this. We said that[218]:

> "While there is no change to the statutory lead standard, there is clear regulatory guidance to inform company lead ambitions in AMP8. We are able to continue meeting the 10µg/l standard that is still the

[217] NES20, section 3.5
[218] NES20, section 3.5

official guidance, and the DWI long-term strategy reduction paper suggests a reduction to 5µg/l by 2035 or 2040 and no detectable lead by somewhere between 2055 and 2070."

"This suggests that some step-change in lead replacement is needed to meet the likely future changes in standards, but there is no regulatory or statutory expectation that we should increase to our "high" rate. DWI has supported our medium option.

"We have considered this carefully, and we believe our regulators would not support a "high" option – even if customers prefer this. Customers were concerned about health risks, and perhaps it has been difficult to explain the effectiveness of plumbosolvency control. This concern does align with the DWI assessment of benefits and risk, and the Inspectorate would support a higher level of investment. However, we were not convinced that the 'high' option could be delivered in practice from 2025, as the supply chain for domestic pipework would not be sufficient to deliver this work (and would take more time to increase).

"We discussed this with the Water Forum, who challenged us to do more – as customers supported a higher option. In response, we increased our "medium" option to include tackling more vulnerable customers so that all of these customers would be lead-free by 2030 (according to our estimates – there are likely to still be some isolated cases we can't find). This does not provide activity as much as the "high" option, which would have meant tackling lead in more "hot spot" local areas, but it means that our lead programme is several times larger than in 2020-25."

601. Our programme for 2025-30 is the most ambitious in the sector[219]. As we described in our business plan, we are not convinced that we could deliver a higher option than our business plan – because the supply chain is not sufficient to deliver this work and will take time to increase.

602. However, this might change before 2030 and more ambition might be possible. Ofwat should reflect the DWI's concerns by setting a **symmetric PCD** which allows *additional* funding if more lead schemes are delivered in the 2025-30 period (at the PCD unit rates). This would allow lead replacement to accelerate more quickly if this were possible. We have already shown that customers support and would be willing to pay for a higher level of investment here, if possible, and DWI have said that this will need to increase substantially in future to meet long-term targets (we also described this in our long-term delivery strategy).

[219] Ofwat model PR24-DD-W-Lead

7.6. RESERVOIR SAFETY

603. We are required to maintain and operate our raw water reservoirs in line with the requirements of the **Reservoirs Act 1975** and the Defra/EA "**Reservoirs: owner and operator requirements**" guidance (June 2014). In August 2017, Defra issued new guidance for reservoir safety[220], outlining a standardised approach and new methods for calculating reservoir "drawdown" – the rate at which the level of a reservoir can be lowered during emergency situations to maintain reservoir safety. Following the guidance in 2017, Defra issued a ministerial direction in 2021 based on the learnings from the 2019 **Toddbrook reservoir incident**.

604. The ministerial direction placed an increased emphasis on drawdown, underlining the critical role of drawdown for the effective mitigation of flood risk, and driving a focus on compliance with the 2017 changes through the statutory reservoir inspection programme. Ofwat's approach in DD matches our enhancement case, which includes investment related to technical guidance updates resulting in significant infrastructure upgrades – but not additional maintenance requests related to the Balmforth recommendations. We note, however, that we do still anticipate some increasing maintenance requirements due to the Balmforth review requirements in AMP8 and beyond.

605. In the DD, Ofwat accepted our evidence that these significant infrastructure upgrades require enhancement funding, but raised concerns about why part of the risk associated with reservoir safety investments could not have been proactively managed through previous base allowances; about the high level of solution and cost uncertainty and the uncertainty of scope; and the scale and scope of benchmarking and cost assurance.

606. We knew that there was significant uncertainty in this area and explained this in NES22. Since publishing our business plan in October 2023, we have continued to work on this (as we said we would in NES22). We provide further detailed evidence about our options selection and benchmarking process in the separate appendix **NES22A – supplementary information for reservoir safety**.

607. This includes reducing our costs for reservoir safety from £80.6m to **£71.2m** since our October plan. This includes efficiency savings of about 10%, as well as changes in the specific reservoir schemes that are required in AMP8 (the statutory compliance date for Cow Green now means that the majority of construction costs for this reservoir fall after 2030, although following the inspection at Hanningfield some costs have been brought forward into AMP8).

[220] **Guide to drawdown capacity for reservoir safety and emergency planning, Defra, 2017**

7.7. SECURITY

608. We acknowledge that the evidence on individual security assets is missing from our business plan, and Ofwat has raised minor concerns on this. We did not include this because this provides specific information about security assets which is protected under the designation of National Security. In our business plan, we invited Ofwat to ask us for any more information they needed to complete this assessment (rather than sharing secure information unnecessarily).

609. We did test if existing assets could be used for new security requirements as part of our business plan development. We created our scope of the number of assets of each type required at each site (which we have already provided to Ofwat as part of the query process) by considering both the total need and the number of existing assets at the site – and the enhancement case includes only the *additional* assets required.

610. We have provided the more detailed information, including the number of each type of assets already at each site and how we used this to create our scope for the enhancement case to Ofwat separately as a spreadsheet NES23A Existing Assets for SEMD sites (not published, and instead provided securely to Ofwat). This provides the evidence Ofwat needs to be confident that we have considered the existing assets already at each site when developing our enhancement costs.

7.8. WASTEWATER – STORM OVERFLOWS

611. Ofwat's model assesses Northumbrian Water's storm overflows costs as broadly efficient. This is despite using an upper quartile efficiency challenge for costs on storm overflow network storage rather than the median (this decision applies an additional £17m, or 6%, efficiency challenge to our costs). Applying a median efficiency challenge would show that our network grey storage costs are broadly the same as the Ofwat modelled costs, rather than 6% below. This decision is not fully justified in Ofwat's enhancement cost modelling appendix, which says:

> "In-the-round, we consider an upper-quartile efficiency challenge is appropriate for grey and grey-hybrid solutions in the network and a median challenge for grey and grey hybrid STW solutions. This leads to efficient expenditure allowances that are in line with the range of benchmarks we have considered and expert engineering judgement:
>
> • For network storage, the upper-quartile challenge brings the implied unit cost allowance (of around £2,557 per meter cube) in line with the mid-range of the unit cost benchmarks considered."[221]

[221] Enhancement cost modelling appendix, p26

612. Ofwat does not set out its specific analysis and comparisons with other benchmarks, and instead describes the source of these benchmarks. These do not always make sense – for example, it is not reasonable to compare the costs to the Stantec report issued in the Storm Overflows Evidence Project, because these are based on a very high level "typical reference tank" basis. We started with costs at this level of accuracy too, but more detailed costs based on more accurate scopes showed that these are not sufficiently accurate to calculate programme costs. It would be reasonable to ask Stantec to explain if they think these should be used as a reference benchmark, or if they consider that water company business plans are likely to have more accurate costs, rather than using this evidence without questioning this.

613. It is not right to assume that unit costs of these schemes would necessarily cost the same as at PR19, because at PR19 these schemes had been selected under the SOAF framework as the closest to cost-beneficial. This selection process means that these are likely to be lower cost schemes compared to those selected in PR24 under SODRP whether they are cost-beneficial or not.

614. It is also not right to assume the same unit cost efficiency challenge should apply to all companies. As Ofwat observes with its use of log linear models, there are economies of scale with different volumes of storage. Some companies have much higher average volumes in their AMP8 plan than others – for example, Welsh Water has an average volume of 4,388; Severn Trent has an average volume of 1,781; United Utilities has an average volume of 1,187; and Anglian Water has an average volume of 1,326 cubic metres. This compares to Northumbrian Water's average of 766. This difference is "built in" to the log model when calculating allowances, and is maintained if a "median" efficiency challenge is used. However, it is not taken into account in the unit cost comparison that is used to move from median to UQ challenge, and this means that the challenge becomes disproportionately stronger for companies with lower average volumes.

615. We note that this efficiency challenge to our costs is entirely removed if the extreme outliers (ANH and NWT) are excluded from the calculation of upper quartile efficiency challenge – this adjusts the median to 92% and the UQ to 89.25%, with an implied unit cost allowance of £2,788 per cubic metre. This demonstrates that the use of upper quartile is not robust from a statistical perspective.

616. Overall, we think there is still a risk that the econometric models could change significantly between DD and FD, with either new data provided by water companies or improvements to the models themselves following feedback from Ofwat's DD consultation. This is a risk because all companies need to continue work to deliver storm overflows, and continued uncertainty about cost allowances have the potential to disrupt this (as we are now already delivering the programme, and FD is very close to the beginning of 2025-26). If models do change, it would be sensible to consider the efficiency challenge applied at DD through these models as a maximum challenge to water company business plans in each of these areas for storm overflows. This will support supply chain confidence in establishing these programmes.

7.8.1. Deep Dive & Outliers

617. In the Deep Dive & Outliers sheet in the storm overflows model, there are seven rows where Ofwat assessed storm overflows projects which were marked as “Cooks outliers” and an efficiency challenge was applied in Column L. For three of these (rows 115, 129 and 130) the text suggests that these passed Ofwat’s assessment and Ofwat says that this is efficient – but efficiency challenges have then been applied nonetheless. This seems to be an error, and correcting this on these three lines would increase the allowance by £6.82m.

618. There are four other rows where Ofwat raised significant concerns about the efficiency of these, having assessed them as Cook outliers. In each case, these are where there are multiple storm overflows in a single drainage community (DC), but the costs of tackling these CSOs for the whole drainage community has been allocated equally between each CSO. This has the effect of overestimating costs for small CSOs, and explains the apparent inefficiency for Teesbank Avenue CSO (two other larger CSOs in this DC); West Rainton CSOs (one other much larger CSO in this DC); and Plawsworth Gate (one other much larger CSO in this DC). We explained this issue in our response to query OFW-OBQ-NES-189, although these specific CSOs were not included in the nine schemes Ofwat had identified at that time and so we can understand why Ofwat did not recognise that this is the same issue.

619. In the additional tables we have provided alongside our response to the DD, we have provided data for storm overflows with costs allocated according to each CSO by storage volume, rather than equally between each CSO in the DC. Ofwat could choose to use this in the storm overflows model – it would not make any difference to the overall modelled allowances (because the equivalent storage volumes have not changed) but it might explain some of the differences in the Cook outliers.

620. In practice, though, these four overflows account for just £0.4m of the difference between our business plan and Ofwat’s allowed costs. These could simply be treated in the same way Ofwat has treated Sleekburn East and other similar storm overflows in the OFW-OBQ-NES-189 query, as it is easy to see in the Ofwat DD model inputs that the allocation issue we described in section 1 (“allocation issue”) of OFW-OBQ-NES-189 applies for these storm overflows too. For example, for Sleekburn East, Ofwat says:

> “The scheme was highlighted through econometric modelling to be an efficient linear outlier by applying Cook's distance. The scheme was therefore removed from the grey/hybrid model and deep dived as an outlier. The scheme is part of a larger catchment level solution, with costs and storage distributed separately amongst the overflows, which lead to some schemes being efficient and others inefficient depending on if the costs and storage for the catchment are assigned to that particular scheme. When considered alongside the other schemes in the same catchment to take a wider view of the interventions in the catchment as a whole, the requested amount appears to be efficient compared to the modelled allowance.”

7.8.2. Storm overflows PCD

621. Ofwat proposes a delivery profile to set time incentives for storm overflow programmes (using the same delivery profile for each company)[222]. We note that we did not provide a delivery profile, with our scheme costs spread equally over the five years of the 2025-30 period. This was because at the time of the business plan submission, we were still scheduling this work.

622. We have now done this in our high-quality plan. This shows a different delivery profile to Ofwat's proposal (see Figure 30.

FIGURE 30 - PROFILE FOR STORM OVERFLOWS PCDS

% storage delivered	2025-26	2026-27	2027-28	2028-29	2029-30
Ofwat profile	5%	15%	35%	65%	100%
NES profile	1%	6%	25%	62%	100%

Source: Northumbrian Water analysis

623. This profile reflects the very small number of schemes and so very small amount of storage which will be fully completed in 2025-26, which is similar to other companies shown in Ofwat's appendix. This also reflects the nature of our larger projects at Marske and Berwick, and we note that although 38% of the storage will be delivered in Year 5, this is only 13% of the projects. A less restrictive PCD would allow more opportunities for an efficient delivery programme which delivers solutions at lower costs – which would ultimately benefit our customers.

624. Ofwat should use our delivery profile to reflect the specific nature of these large projects – these are not the same as others in the sector, where grey storage schemes and specific large projects drive quite different storage delivery profiles. Ofwat should consider if a restrictive PCD delivery profile reduces the potential for more efficient delivery.

625. Ofwat says that companies cannot substitute grey schemes with green only schemes. This seems unnecessarily restrictive, and in conflict with the SODRP which expects "water companies to prioritise… catchment level and nature-based solutions in their planning"[223]. Defra expected Ofwat to work to ensure that assessment processes promote and incentivise the use of nature-based solutions in favour of more carbon intensive alternatives. Ofwat should consider how grey schemes could be substituted for green only schemes where this supports nature-based solutions.

[222] Table 2 of the Price Control Deliverables appendix at DD
[223] SODRP, Principle 6

626. In SODRP, Defra also says that "green infrastructure projects started before 2027 and delivered as quickly as possible will count towards completion of the targets, subject to review. This will be the case even when the full environmental impact of these projects has not yet been realised by the target end date"[224]. Ofwat should consider how this will be achieved in the PCD.

627. Finally, it is important for Ofwat to be very clear about some of the aspects of this PCD. We think that adjustments based on actual equivalent storage are to be made at a programme level, rather than a scheme level, as this allows the flexibility needed to address different requirements when further assessments are done – but the PCD is not explicit about this. We also think we have already carried out sufficient investigation to determine the root cause of spills and to identify the best value solutions, but the PCD description is not sufficiently detailed to know if the intended criteria are met here. Ofwat should set out the method for demonstrating permit compliance or ask water companies to share their methodology before FD.

7.9. WASTEWATER – SLUDGE STORAGE

628. Ofwat recognises in its DD that the model they have used for sludge cake storage is not very effective, saying that:

> "We considered approaching the cost assessment by separating the submissions into categories according to scope complexity, however there was a broad range of interventions submitted, ranging from uncovered cake pads to odour-controlled buildings and a number of interventions combining both solutions. This made separation of the proposals challenging and this approach was discounted. We considered approaching the cost assessment of all the companies using linear or log regression models, however as can be seen, there is poor correlation and no rationale to use these approaches, they were deemed unsuitable."[225]

629. However, using a simple median rate suffers from precisely the same challenges – this is no better than the linear or log linear regression models that were deemed unsuitable. We can demonstrate this by considering the correlation coefficient between the requested totex and the area of cake storage (0.35), which shows that a median is not sensible. This is clearly a difficult area to compare using a model.

630. We also reviewed other water company business cases to test if our proposed sludge barn was efficient. Using a simple unit rate of sludge area against cost, we appeared to be inefficient – with an efficiency score of 1.52 in our assessment once some alterations had been made to include costs mentioned in each company's enhancement case documents as well as in the business plan tables (with Severn Trent appearing to be the median company). There are large variations in rates, but also large differences in scopes and the assumptions that had been made

[224] SODRP, Principle 6
[225] PR24-DD-WW-Sludge-Storage-Cake model, Ofwat DD, "Modelled costs" sheet

in developing and costing these scopes. So, we asked Stantec to examine this in more detail to understand how these cases compared – and to test if our costs are efficient.

631. We found that some companies had assumed that storage would not be covered, or that lower cost modular coverage structures (such as fabric buildings) could be used. Of these, some had noted that there would be additional costs if covered storage is required.

- Anglian Water proposed that if fully enclosed buildings are required for the storage of biosolids, they "would face considerable additional costs which have not been included in our plan[226]", and so proposed a Notified Item for IED requirements in case covered storage was required.
- Southern Water proposed a "Dutch barn" solution in Kent and fabric buildings elsewhere. These are covered, but much cheaper options as they have no ventilation control or capacity to include this later.
- Wessex Water noted that each set of barns would need to have odour control to comply with the IEA and the Environmental Permitting Regulations (EPR). The plan says that the design specification of the odour control units were not available, hence Wessex Water excluded odour control from their capex estimates.
- United Utilities included costs for a "Dutch barn" solution, noting that they had excluded costs to provide fully enclosed and ventilated storage.
- Severn Trent noted that it would cost an additional £6.7m per site to install cake storage covers, and have provided their costs for uncovered storage only.

632. If we compared the costs including covered storage, business plans would show the following efficiency rankings:

FIGURE 31 - SLUDGE STORAGE COSTS USING MEDIAN

Company	Totex requested	Cake pads area	Modelled allowance	Efficiency
ANH	£42.78m	76,398	£186.8m	0.23[227]
SRN	£31.60m	31,748	£77.6m	0.41[228]
WSX	£44.67m	40,294	£98.5m	0.45[229]
NES	£64.59m	26,625	£65.1m	0.99
UUW	£109.54m	44,455	£108.7m	1.01
WSH	£16.83m	5,026	£12.3m	1.37
YKY	£95.82m[230]	18,915	£46.2m	2.07
SVE	£97.94m[231]	10,968	£26.8	3.65

Source: Northumbrian Water analysis

[226] Anglian Water business plan, p158
[227] Does not include covered storage – proposes notified item in case covered storage is required.
[228] Assumes covered storage but "Dutch barn" with no odour control
[229] Excludes odour control from costs (though Wessex says this is needed).
[230] Including costs allocated to IED additional enhancement line
[231] Including additional costs for covered storage

633. We carried out this analysis before the DD, so the data does not match revisions to business plans (and we do not expect this to be used directly to demonstrate efficiency). However, this analysis did show that some modifications could be made to the cost inputs for the Ofwat model to improve its ability to estimate costs:

- Severn Trent noted that it would cost an additional £6.7m per site to install cake storage covers and have provided their costs for uncovered storage only. Ofwat should include these costs in the "totex requested" when calculating median costs, as this is more closely comparable to other costs in the table (which are all for covered storage). Welsh Water did not include costs in their plan for installing covers later, but this could be considered too.
- Yorkshire Water had some costs split into the IED enhancement line, and so this does not seem to be an accurate comparison of the full costs associated with the scheme. We note that Ofwat removed this from IED costs but did not add this back into sludge storage enhancement for the purposes of comparing companies[232].

634. When we adjust the costs for Severn Trent and exclude the costs for Yorkshire Water (we could not easily reallocate these costs), the median calculated in Ofwat's DD model increases to £1,425/m^2. This shows a cost for Northumbrian Water of £37.952m (not including odour control).

635. In our enhancement case NES34, we considered whether or not covered storage and odour control were necessary or not. We considered a sludge barn at a single location without odour control to be the least cost option, but selected a sludge barn at a single location with odour control because we know that planning permission was very likely to require odour control – with potential odour complaints and an increase in air emissions at any potential site. In practice, the Sludge Strategy is likely to mean that sludge is brought into the Environmental Permitting Regulations, which would require us to meet the EA's guidance on "**Biological Waste Treatment: appropriate measures for permitting facilities**". This would require us to manage odours and fugitive emissions, and so we were concerned that storage constructed as a "Dutch barn" or uncovered would be made redundant. Anglian Water proposed that covered storage requirements would be included in an uncertainty mechanism, if required.

636. The draft determination makes it clear that these potential costs are not included in totex allowances and are instead covered by a new uncertainty mechanism. We also note that other companies have used a "Dutch barn" approach. So, in our response to draft determinations we have revised our plan to build two "Dutch barns" to meet the requirements.

637. In NES24, we set out the least cost option (without odour control) at £39.732m[233] - we have modified this plan slightly, selecting two "Dutch barns" instead. So, we have included £39.713m in the business plan tables supporting our DD response instead. Our analysis shows that this would be much closer to the median efficiency

[232] PR24-draft-determinations-Expenditure-allowances-Enhancement-cost-modelling-appendix.pdf (ofwat.gov.uk), p65
[233] NES32, Table 14

shown in the adjusted sludge storage model – as we might expect, as this is closer to the average approach used by the industry, with no odour control needed.

638. Even with these changes, the model is still not a particularly good fit and Ofwat might wish to consider an alternative approach. A deep dive might have been more appropriate to reflect the different approaches companies have used here – however, we understand that this now might be too late. We have shown that it is possible to reflect some of these differences in the unit cost model, and it might be that more information from companies would support further improvements (such as the costs for Anglian Water if they did not have a notified item for covered storage).

639. However, with appropriate adjustments this model would estimate a cost which is about the same as our "Dutch barn" alternative solution – this project would then be deliverable for the cost allowance (where it would not be deliverable for the cost allowance set at DD).

7.10. WASTEWATER - MONITORING

640. We have updated the costs and volumes for both our **emergency monitoring** and **continuous water quality monitoring** programmes since our business plan. As we explain in section 10.3, this is in response to changes in WINEP guidance and requirements since then (and we have kept Ofwat updated on our expectations on this throughout the process).

7.10.1. Continuous water quality monitoring

641. We have now redeveloped our programme and costs for continuous water quality monitoring based on the August 2023 guidance and subsequent discussions with the Environment Agency – who have clarified how they expect companies to meet this guidance. This reduction is primarily due to a reduction of the number of monitors required to be installed in AMP8 from 1,187 in October to 390 now, as well as some changes in costs. We explain this in more detail in section 10.3.

642. This revised plan will reduce our AMP8 totex from £124.79m in our October business plan to £55.45m now (compared to our estimated £58.14m in our 25 January alternative business plan tables, due to refined costs and additional requirements from guidance). Our revised business plan tables include these changes, including the number of monitors.

643. This compares to an estimated £52.405m for the same programme in the Ofwat DD model, with a marginal increase in the median unit cost across the sector. This improves the Ofwat unit cost model as we were a significant outlier, with a closer match now between the sector requested and modelled costs. This does not greatly affect the costs allowed for other companies if the model is rerun (0.89% increase on modelled allowances for all other companies).

644. Alternatively, Ofwat could choose to update just the number of units for Northumbrian Water and preserve the DD model – this would give an allowance of £51.94m for Northumbrian Water and would not increase allowances for other companies.

7.10.2. Monitoring at emergency sewage pumping station overflows

645. Our business plan was based on an assumption that we would need to install all monitors at emergency overflows by 2030 (that is, to the timetable set out in the WINEP guidance). We explained in our enhancement case that the EA had written to us on 18 August 2023 to tell us that this would be revised so that 25% of sites would need to be completed by 31 March 2020, and the remaining 75% of sites by 31 March 2035 – with revised guidance to be published, and a final list of sites to be delivered in AMP8 would be agreed with the EA by December 2023[234].

646. We used this full 100% requirement in our business plan, as the guidance had not formally changed and we felt this would not be a compliant plan if we moved to a 25% profile. Ofwat reduced this by 75% in the DD, to compare with other companies, and this was the correct treatment (we note that this was described throughout the DD as part of the efficiency challenge made, which is not correct).

647. We wrote to Ofwat on 24 May to explain that we have continued working with the national EA PR24 team to determine the sites for inclusion under the U_MON6 emergency overflows driver in our AMP8 WINEP. We said that this will be broadly equivalent to 25% of the sites in our plan in October, with the remainder (75%) to be phased in subsequent AMPs – but this depends on the prioritisation of sites, which must still be agreed with the EA. We proposed a set of sites for AMP8 that would mean £28.45m of capex, which is almost exactly the same as 25% of the capex in our business plan. The precise set of sites has still not been agreed, but we do expect this to be equivalent to 25% of the total expenditure.

648. Further to this, Defra wrote to us while we were finalising our response to the DD (on **21 August**) to explain that we should include an increase to 50% of the total programme by 2030. We have not included this in our business plan tables as it was too late in the process to do this. We also note that this would not match WINEP or official guidance yet – Ofwat's guidance was very clear that they expected the business plan tables to match WINEP as a "compliant plan".

649. However, we understand that Defra has set an expectation for Ofwat to include this in the FD. A simple way of addressing this would be for Ofwat to increase this to **£39.1m** – that is, double the revised plan set out in paragraph 658 below – in order to match this requirement. We expect that it will take some time to agree the list of sites under revised guidance, and we will continue working with the EA to agree this – and will share with Ofwat so that this can be fully reflected at FD.

[234] NES30, p10

650. Ofwat also raised some concerns about our evidence that our proposed costs are efficient. Since submitting our business plan, we have compared our proposed scope with that put forward by other companies in their business plans, and we have observed some important differences – including that we seem to be an expensive outlier. The main reason for this was the inclusion of costs for telemetry.

651. Telemetry is an important part of monitoring, because this provides the method for transmitting data from monitors at each site. We had already identified that many of these sites don't already have adequate telemetry installed, or the infrastructure in which it could be installed. Our business plan unit costs included costs for telemetry at all sites. We looked at how other water companies had treated these costs, and whether or not they had included telemetry. We found that:

- Companies varied in their level of detail on their approach to costing and scope, from high level with size bands (NES, SRN, YKY) to minimal.
- Two other companies mention telemetry and communications, with no allowance made in their plans for additional costs.
- United Utilities included some telemetry in their costings, where applicable.

652. We decided to test if telemetry really was needed, by sampling our sites. We asked our contractor to look in more detail at 18 representative sites and to speak to our telemetry experts to understand the existing infrastructure and how this might be used. This showed that at ten sites, there were no issues with existing infrastructure. At 4 sites, some upgrades were needed to existing infrastructure – and at 4 sites, there were issues which would likely require a complete upgrade. These issues included outstations that could not support the new data, and a lack of sufficient inputs and outputs to allow additional monitoring equipment to be added without upgrades. None of these are current issues with the equipment – simply that the technology already on site does not support the new requirements, so upgrades are required.

653. We calculated our costs without this telemetry, to test if this was the difference between our costs and the rest of the sector in the models. Removing our telemetry costs entirely would be a cost of £12.088m for 316 schemes in the "MCERTS EDM and civils" category (a unit cost of 0.038), and a cost of £40.815m for 281 schemes in the "MCERTS EDM and pass forward flow monitor and civils" category (a unit cost of 0.145).

654. These unit costs look much more comparable with the sector. For "MCERTS EDM and civils", our unit cost is similar to the sector median set by Wessex Water (at 0.035), with only United Utilities still looking like an outlier (and, as above, we think they have also included telemetry in their costs). For "MCERTS EDM and pass forward flow monitor and civils", our unit cost remains a little higher than the sector median but is now well within the range set by other companies (we are the 5th of 11 companies in the sector, and below the mean unit rate).

655. Without any telemetry, our costs for the full monitoring programme (100%) would be £52.9m, compared to £38.638m in the Ofwat model (if these new costs were used). We think this is because we are among the

companies who have taken a slightly more detailed approach to these costings, with other companies who have done this seeing a similar amount of reduction in their allowances.

656. We do also need telemetry upgrades as part of this enhancement programme, and we think that most companies have not yet considered these costs. After our inspection at 18 representative sites, we can reduce our estimate for telemetry costs because we have found that some sites do already have some existing excess capacity that can be used. We used a simple method to estimate the likelihood of telemetry being required at each site: we assume that 50% of all sites do not need any telemetry upgrades; 25% of sites require half the costs for telemetry upgrades ("amber sites"); and 25% require all of the costs for telemetry upgrades ("red sites"). Taken together, this means that around 37.5% of the costs for telemetry will be needed in practice. We have reduced this to 35% to account for any missing data or maintenance.

657. This increases our estimated costs for this programme from £52.9m to £78.2m (compared to £124.5m in the business plan, which assumed 100% telemetry). This is simply because the telemetry assumptions have been changed after our site inspections, to assume that only 35% of these costs are actually needed in practice.

658. Finally, we have reduced our costs to 25% of the original programme – to reflect the updated guidance from the EA. This means that our revised business plan tables include **£19.541m** of totex for monitoring at emergency overflows (0.7% materiality). This includes £6.325m of telemetry costs, which we ask Ofwat to consider separately. It would not be reasonable to disregard these costs simply because other companies have not done enough to fully consider the risks, options and costs for monitoring.

659. We calculate that the Ofwat DD model would allow £9.660m for this number of monitors, which – if the £6.325m of telemetry costs is considered separately – would allow £15.985m of totex at FD (roughly the same as if the whole cost were included in a deep dive with 20% reduction for cost efficiency, as in the DD model). We think this efficiency challenge likely comes from overly optimistic costs across the sector due to the guidance being new, rather than a realistic comparison. However, this is a small efficiency challenge, and we could accept this in the round.

7.11. OTHER WINEP DEEP DIVES

660. Ofwat's draft determination (DD) challenged us to provide further evidence on optioneering and cost efficiency for three areas of WINEP – our **NIDP programme** (in PR24-DD-WW-25-year-environment-plan); our **wastewater investigations** (in PR24-DD-WW-investigations); and our **biodiversity programme** (in PR24-DD-W-Biodiversity).

661. For each of these, we have not changed our programme in response, as these are the programmes agreed under WINEP and we are confident that these costs are efficient and the optioneering under WINEP has been considered fully and carefully. Instead, we have provided further evidence to show how we have done this,

including some elements that we have been able to build on since the business plan submission (see the separate document NES81 – optioneering and cost efficiency on WINEP).

662. Ofwat raised some concerns about their ability to reconcile the business plan with the September 2023 WINEP programme held by the EA. This is because the programme held by the EA has some errors which we have previously explained to the EA. In NES81, we provide an explanation of this and how this can be reconciled.

663. For NIDP, we have adjusted the number of schemes to 60 (from 66), as this is the correct view of what will be delivered. Ofwat have included the Ouseburn Catchment Partnership in our overall PCD for NIDP improvements. We do not believe this is appropriate as the investment is small (<£100k) and is to support the delivery of a catchment improvement plan. It is not related to the 60 schemes we have proposed under the NIDP investment and as such the PCD proposed by Ofwat is not proportional to investment proposed. Ofwat should therefore remove the Ouseburn catchment from the PCD.

7.12. CHEMICALS REMOVAL

664. Ofwat's chemicals removal model[235] applies an efficiency challenge of £3.059m to our costs (14% reduction). Most of the efficiency challenge is applied because of an error, rather than because our costs are inefficient under the model. That is, Ofwat rounds the co-efficient calculated in the model before calculating allowances. This changes the coefficient used to calculate allowances from 0.000129 to 0.0001.

665. Although this does not sound like a very important change, this changes the allowance for treatment schemes from £19.15m (in the DD model) to £21.08m (when the rounding is removed[236]). Across the whole sector, this changes the total from to £161.107m to £185.943

666. m. This is a simple error in applying the regression model in the spreadsheet – there would be no justification for rounding this to 1sf.

667. Further to this, if Severn Trent were removed from the regression model, our allowance would change to £22.73m (with no impact on the model fit). Severn Trent is responsible for 67% of all population equivalent across the schemes, and so has a disproportionate impact on the model here. In turn, this is dominated by requirements to reduce dissolved nickel through an activated carbon tertiary treatment process at Coventry WWTW (this accounts for 85% of Severn Trent's PE237, and so accounts for 57% of the total PE).

[235] PR24-DD-WW-Chemicals-Removal model
[236] This rounding should be removed from PR24-DD-WW-Chemicals-Removal model, "Modelled costs" sheet, Column L
[237] Severn Trent APR Table 7B, 2023-24 and Severn Trent business plan (SVE27-04b)

668. We note that a different functional form might have a better fit than a linear regression, particularly reflecting economies of scale (as this dominates the model, due to Coventry WWTW). We found that models of this form could have a higher R squared value too.

669. Ofwat has removed Thames from the model as an outlier already, and we note that the rationale for doing this is that some of these schemes have different activity and so are not directly comparable. The same rationale should really be applied to other schemes too: not all chemical treatment schemes are the same, with some across all companies requiring separate treatment for multiple chemicals (that require different processes).

670. In particular, our two treatment schemes are different from all other chemical treatment schemes because they will change the outfall location so that it is into a less sensitive or larger water course. This tackles the phosphorus driver at these sites too, rather than proposing a separate phosphorus treatment under a different enhancement model. For Bowburn STW, the site already has the best available treatment solution installed so there is no viable treatment solution; for Sedgeletch STW the site requires improvements for both zinc and cypermethrin as well as phosphorus treatment. Each of these would require a different specific tertiary treatment solution, but we have looked at this together and found that a transfer scheme will address all three needs in a much more efficient way. In our enhancement case NES39 we assessed the schemes for best value, noting that moving to transfer schemes would have better carbon impacts too.

671. This means that the DD model does not compare like with like – because our schemes tackle more than one driver, including needs assessed outside the chemical treatment model. If we had instead proposed separate treatment at Sedgeletch STW for chemicals and phosphorus, we would have no efficiency challenge in this model and then would be assessed as efficient for phosphorus in the phosphorus enhancement model at DD. These costs would be higher, though – Figure 32 shows that the costs for the transfer option are much cheaper when these options are considered across all needs together.

FIGURE 32 - COMPARISON OF CHEMICALS OPTION COSTS

Site	Option 1	Option 2	Option 3
Sedgeletch Zinc	Transfer to Wear Estuary (£11.353m)	pH precipitation (£10.3m)	Absorption media (£12.1m)
Sedgeletch Cyp		Upgrade ASP and TSC (£9.9m)	Upgrade chemical dosing and co-mag (£11.0m)
Sedgeletch P		Upgrade chemical dosing (within option 3)	

Source: Northumbrian Water analysis

672. By combining these two needs together, we have proposed an alternative, more efficient solution – and then have been penalised here for doing so. Where other water companies have both needs, they have proposed treatment solutions such as GAC for chemical removal and a phosphorus solution.

673. We ask Ofwat to consider this in assessing efficiency. One solution to this would be to allocate part of the costs to phosphorus removal and assess this through the phosphorus removal enhancement model. However, this is not the right solution for customers because this would estimate more funding than is really required across the two models together (we are very efficient on phosphorus removal due to our catchment solutions). Instead, we ask Ofwat to recognise this issue and the limitations of the model – and so allow our efficient costs here.

674. Ofwat also applies a shallow dive efficiency challenge to our non-treatment costs, but this should become a zero challenge when the error in the shallow dive model is corrected (see section 7.2).

7.13. NUTRIENTS – ADDITIONAL LONG SEA OUTFALL

675. We were pleased to see that Ofwat agreed with our efficient costs across all nutrients (phosphorus, nitrogen, and sanitary parameters). Since the plan, we have been required to add a long sea outfall to our nutrient neutrality programme (we describe this in more detail in section 10.1). This was already included as an option in our business plan, and the need and options assessment has already been scored under the deep dive in the PR24-DD-WW-N-Removal model, along with most of the information on cost efficiency. However, we also provide additional information on the cost breakdown and benchmarking of this additional project in NES28A – protected areas – supplementary business case for long sea outfall (attached to our response), to support Ofwat in maintaining its confidence in our costs for this for FD.

676. We have included updated costs for this in our revised business plan tables.

7.14. PHOSPHORUS – PCD FOR TREATMENT

677. The phosphorus removal (P removal) schemes in our business plan cover 49 WWTWs, and we have included these under different cost drivers with different solutions at catchment scheme level. This is complicated because we have only four WWTWs in the “traditional P removal” cost lines; with two catchment schemes (which also include some traditional P removal elements at four WWTWs); seven catchment nutrient balancing schemes (which also include some traditional P removal elements at nine WWTWs); and two nature-based solutions.

678. This complexity means that interpreting and assessing these costs for PR24 has not been easy for Ofwat. In particular, the approach to setting a PCD does not seem correct for Northumbrian Water at DD. In our response to Ofwat’s separate query OFW-REP-NES-005, we propose an alternative and corrected approach.

679. In summary, Ofwat should include *all* end-of-pipe P removal solutions within their PCDWW10, not just the six schemes Ofwat has proposed (and we note that two of those six proposed schemes are included incorrectly, as

they are not traditional P removal schemes). We have identified the 17 WWTWs where this investment is taking place, and we show how this would meet Ofwat's proposed delivery profile for this PCD[238].

680. Our other phosphorus schemes are included in the separate PCDWW13a (catchment solutions for nutrients and sanitary determinands). This PCD currently combines catchment permitting and catchment nutrient balancing solutions, which are quite different – and it includes some end-of-pipe P removal schemes, which we think are best included in PCDWW10. In our response to OFW-REP-NES-005, we show that this would reduce the expenditure linked to this PCDWW13a to £28m.

681. Ofwat should consider if this PCDWW13a is still needed, as this would not necessarily meet the materiality requirements – and the catchment solutions approach is innovative and still in development. We do not know if the benefits are fully quantified and certain at this stage, and delivering these depends on many factors (such as environment context and local catchment conditions; co-funded partnership working; and landowner engagement and willingness to adopt and support catchment solutions into the long term).

682. However, if PCDWW13a is still needed, we propose some adjustments that should be made as part of our response to OFW-REP-NES-005.

683. Ofwat should also be more specific about exactly which PE will be used for reporting purposes (for this and any others that use PE). The PE changes over time as information changes (for example, usage patterns and rainfall) and so the eventual PE at any given site in 2029/30 might be different to that assumed when WINEP schemes were agreed. It would be sensible to use the designed PE for these specific sites to reconcile these PCDs.

7.15. GROWTH AT WWTWS

684. In query OFW-OBQ-NES-083, we explained that we spent much less than we forecast during AMP7 on Howdon WWTW growth. Howdon is our largest STW covering all of Newcastle city, Gateshead and the surrounding area. Due to the impact of COVID the growth in this area slowed, especially due to a drop in occupation of office and commercial premises. There were also drops in trade effluent into the site.

685. In addition to this, we have carried out work to delay the need for growth expenditure at Howdon. We have undertaken five surface water removal projects since 2013 and have delivered a number of flood alleviation schemes which have reduced inflow to Howdon.

686. This work, along with reductions in forecast demand growth, has allowed us to delay the need for growth expenditure - but the site is still projected to exceed the DWF permit consent by 2030. We have begun work in AMP7 to prepare for this, including land purchase, treatment process trials, modelling and initial design work. It is highly likely that we will have new quality and flow permit conditions, but these have not yet been agreed by the

[238] Table 3 of DD Price Control Deliverables Appendix

EA. They are likely to include a new ammonia consent (the site currently doesn't require an ammonia consent), tightening of BOD, suspended solids, and new validated dose requirements for UV. There will also be a requirement for an increase to FFT, and potentially storm tank size.

687. In our PR19 business plan, we requested £111m which included £90.96m for Howdon – Ofwat did not allow this expenditure as enhancement but assumed that it was included in base expenditure models at PR19 (with Howdon growth being a "lumpy" investment). As we had spent £28.4m in AMP7, we deferred £82.5m of funding into AMP8 that would have otherwise been spent in 2023/24 and 2024/25, and we had not requested this funding again in our business plan as we had accepted that Ofwat would not allow this. We spent most of our allowance for growth that was in base models from PR19 (as set out in the PR24 growth model).

688. Ofwat has included growth at Howdon within its assessment of the AMP7 Howdon resilience scheme. In the PR24-DD-ODI-Performance-Model for 2024/25, Ofwat says that "the performance commitment for AMP7 explicitly includes the delivery of growth-related resilience investment…. This is because, based on the submissions at that time, the enhancement projects would do nothing to improve resilience unless the underlying work to address the growth element was also being delivered."[239] We do not think this is sensible, as it is efficient to delay expenditure for growth until it is needed – if we had delivered this in AMP7, customers would have paid for an investment that is not yet needed. Our full response to the AMP7 ODI assessment is in section 9.4.

689. Since our business plan, we have grown increasingly concerned that investment to tackle growth at Howdon could be significantly more expensive than we had forecast for AMP7. Our initial costs estimate that this could be as much as **£320m**, and this is supported by Ofwat's cost models at PR24 which estimate that this could be even higher at £329m. These costs are based on high level estimates rather than the specific permit requirements which are not yet certain, and they are very strongly influenced by requirements for a greatly increased storm tank size (compared to when this was assessed for PR19). This is because the guidance for U-IMP6 in WINEP at PR19 excluded all sites which discharged into a "transitional and coastal" (TraC) waterbody – based on the dilution at these sites which meant that there was a low environmental need. However, this guidance has changed, and the storm tank size would need to be increased from its current permit level to the modern formula of 68l/hd. We estimate that this would cost around £122m, a significant proportion of the overall scope cost.

690. We have not included this in our plan in response to DD. There is some uncertainty around the scope and costs, which are not yet as well developed as they need to be, and we would like to explore alternative options to storm tanks of this size.

691. However, we ask Ofwat to include this in the **large scheme gated process**. There will need to be a better developed project scope and detailed costs for delivery after further discussions and agreement with the Environment Agency, and this should be possible for the submission date of 3 November 2025. We do not think

[239] PR24-DD-ODI-Performance-Model-2024-25, Override_Additional info sheet

there is a need for the inclusion of any delivery costs at PR24 before this, as we would expect to carry out the initial preparatory work through base expenditure.

8. PERFORMANCE COMMITMENTS

8.1. SUMMARY

692. We are pleased that Ofwat has largely recognised that our PCLs are stretching and has adopted most of these. We support the strengthening of ODI incentives where these match customer priorities, and where there is evidence that customers are willing to pay for improvements. We also recognise that during AMP7 the incentive regime has often meant that the costs of driving service improvement were greater than the value of the incentives so a stronger regime could be more effective.

693. However, we consider that a number of Ofwat's proposals collectively create **significant asymmetrical downside risk for companies that must be addressed**.

694. Ofwat estimated that the P50 for their overall package at the DD was 0, with a range from a P10 of -2.3% to a P90 of 2.0%. This is not correct. Examining Ofwat's analysis in more detail shows that they have calculated a P50 of 0 simply because they have assumed that the notional company will meet all of its targets. This is not a reasonable assumption to make when testing the overall balance of the package when the experience in AMP 7 is that no company is delivering the PCL package set at PR19.

695. Our view of the balance of the package at DD is that we expect the P50 for ODIs to sit at -£145m[240] (or -0.97% of RORE, with a range from a P10 of -1.95% and a P90 of 0.01%). This is much more skewed than under Ofwat's calculations – several PCs and ODIs are "penalty only", which means that on an expected basis the P50 should be negative.

696. Overall, at a sector level, we consider that the package of incentives proposed in the DD would be an impossible challenge across the sector, with for example Moody's estimating net penalties of at least £2bn – if companies perform in line with their business plan assumptions. Most companies are likely to incur net penalties in AMP8.[241]

697. For our business plan, we built a model that used historical performance data at an industry level and operational expertise and judgement of our own performance to develop expected performance ranges for each service level across the period. We then used Monte Carlo analysis to develop probability distributions across the package for the AMP8 period. We estimated that we would expect to have penalties of around -0.22% of RORE across the period, with an asymmetric downside skew (a range from a P10 of -1.18% to a P90 of 0.75%). To reflect this imbalance, we proposed that Ofwat should "aim up" on the allowed equity return by a similar 25bps, consistent with the PR19 CMA precedent.[242]

[240] NWL Monte Carlo Analysis
[241] Moody's in-depth report, 14 August 2024
[242] CMA, 2021, Final report, p.1098, paras 9.1402-9.1404

698. Our analysis of the DD suggests that the P50 is 0.97% RoRE but it does not seem feasible to "aim up" to this scale on the allowed return and we agree with Ofwat that asymmetry should be addressed at source. So the package of PCLs and ODIs should be reviewed instead to restore more balance to this incentive package.

699. We know that we are among the better performers in the sector in AMP7, with the fifth highest RORE from PCs in 2022-23 – but still only around 0% RORE. This indicates that the package of outcomes and ODIs was overcooked at PR19 and was skewed to the downside (almost all companies are underperforming the notional company, and more would be if it were not for bespoke incentives that are to be removed at PR24). We also know that we are likely to be able to accept many of Ofwat's performance commitment targets in the DD for 2029-30 (though not necessarily the glidepaths and incentive packages). That isn't likely to be the case for many other water companies, who would see a much larger penalty at P50.

700. With this in mind, we propose the following changes that could support an overall package of incentives that are deliverable, and where the P50 is not negatively skewed. These are:

- Restoring a number of **deadbands for asymmetric performance commitments** – that is, discharge compliance (see section 8.2.1), and serious pollutions (see section 8.2.2). This would help to reduce some of the downside risk of these performance commitments. The deadband should also follow the same trajectory across all companies for compliance risk index (CRI), see section 0.
- Reconsidering the **introduction of asymmetric downside skew for C-MEX** or looking at ways to mitigate this while incentivising improving customer service (see section 8.3).
- Reconsidering the **level of baseline performance** against several measures in the package, including PCC, interruptions to supply, and pollutions. In each of these cases, Ofwat has made assumptions about the starting point for AMP8 based on historical targets and definitions rather than historical and realistic future performance, and this means that these do not match the likely future risks and challenges. This includes the impact of extreme weather events, which is expected to increase. We propose changes to these in section 8.4 including the potential for a graduated PCL incentive target for pollutions.
- Making provision for extreme weather events either by funding our enhancement cases to mitigate these risks, or including an exception for **extreme weather** events to a number of measures detailed in Frontier Economics' paper (see section 8.5), and[243]
- Reconsidering the **inclusion of growth assumptions** in the non-household demand performance commitment or looking at ways to mitigate this downside risk that is beyond the control of water companies (see section 8.6).

[243] Frontier Economics, Extreme Weather Event Risk, pages 45-46, Extreme_weather_event_risk_report.pdf (ofwat.gov.uk)

701. These, alongside our other changes detailed below, would reduce the P50 scenario for NWL from -£145m to -around £34m.

702. In addition to these changes, we respond to **several other specific issues on performance commitment definitions and profiles in the DD**. This includes revised profiles for the bathing water quality (BWQ) and river water quality (RWQ) performance commitments, which we have revised to accommodate 2023 performance and an additional bathing water site for BWQ and to match Ofwat's clarification of the methodology for RWQ (as described in our letter to Ofwat in June 2024).

703. In section 8.8 we provide feedback and comments on the water quality contacts performance commitment and in section 8.9 we summarise the impact of the changes to our investment programme on storm overflows on the related performance commitment.

704. There are four areas where we do not agree with Ofwat's approach on specific performance commitments. These are:

- **Biodiversity** – where we do not think a financial performance commitment is needed, and where we do not think the performance commitment proposed in the DD achieves its objectives; and
- **Unplanned outage** – where we think the increased ODI rate is now disproportionate to the impact on customers from unplanned outage (which does not lead to interruptions to customers in practice but was instead intended as a measure of asset health). This distorts incentives that would be better focused on improving performance in the areas which are a higher priority for customers.
- **Mains Repairs** – where we do not agree with Ofwat's proposed PCL for AMP8. The 0.43% replacement rate we propose allows a stable level of mains repairs, with the benefits starting in AMP9.
- **Operational Greenhouse gas emissions** – where we do not agree with the scale of the reduction in emissions to be delivered from the additional base funding.

705. Finally we comment on Ofwat's proposal to collect APR performance data on 15 June.

8.2. ADDRESSING ASYMMETRY: DEADBANDS

706. We support Ofwat's approach in setting CRI, serious pollutions and discharge compliance targets at full compliance, and we did this in our business plan too. However, experience shows that rarely are companies able to achieve full compliance and it clearly isn't possible to have more than 100% compliance which introduces a downside skew automatically.

707. To illustrate this point, if Northumbrian Water were to fail by one point against all three – a performance position that in 2023 would be second in the sector on serious pollutions and discharge compliance and would be third in the sector on CRI - it would mean a penalty of £6.4m.

708. We do not agree with Ofwat's DD position, where they have not included a deadband for either discharge compliance or serious pollutions. We note that this decision for Northumbrian means an additional penalty of £16.2m if we were to perform exactly at our proposed deadband in every year (one serious pollution incident and 99% discharge permit compliance each year).

709. We do agree with Ofwat's proposal to set a deadband for CRI. However, the four companies who appealed to the CMA at PR19 should not continue to have a higher deadband after 2025. Companies should have consistent risk protection in line with the notional company and to avoid clear and obvious discrimination.

710. Finally, we note that the CMA had previously set a deadband for unplanned outage to reduce asymmetric risk exposure – and this should be introduced again as a method to address this (see section 0).

711. To remedy the asymmetric skew from penalty only measures, there are three ways that this could be addressed: re-introducing deadbands against measures; including additional funding to offset the downside skew (£24.42m is equivalent to 1 serious pollution and 99% discharge compliance deadbands for 5 years, pre Monte Carlo for example) ; or setting a performance commitment at the deadband level with a symmetric reward for achieving full compliance. We recommend the approach of setting deadbands.

8.2.1. Discharge Compliance

712. At PR19, Ofwat set a deadband at 99% for discharge compliance. This meant a 1% allowance before any penalty was applied. This was agreed with the EA and was consistent with their approach in the Environmental Performance Assessment, which considers performance of 99% and above to be "achieved target or better"[244].

713. Setting a **deadband** of 99% would reduce the level of risk for the higher performance companies, with no automatic penalty. This would continue to see half the industry receiving underperformance penalties based on their historic performance (over the last seven years an average of 5.7 companies have performed below the 99% deadband)[245]. This suggests that the sector level P50 is approximately a performance level of 99%. We propose the continued inclusion (continuing from PR19) of a 99% deadband on discharge compliance.

714. In the DD, Ofwat explains that they "avoid the use of deadbands… because we consider performance to be within company control and because they substantially weaken incentives on companies to improve their performance when they are close to their performance commitment level.[246]" Discharge compliance is within company control, but this is not the reason why a deadband might be set here – Ofwat did not think that this was outside company control when they set a deadband at PR19 either, but instead set a deadband at 99% to prevent a large downside skew from their performance commitment. This should be done again, for the same reason.

[244] Environmental Performance Assessment, EA 2023
[245] NWL Analysis of Ofwat's Industry Historic Performance Data Set – Discharge Compliance
[246] PR24 DD, Delivering Outcomes Appendix, p34

715. This also does not weaken incentives on companies to improve their performance beyond 99%. Companies plan and invest to meet discharge permit compliance at *every* treatment works and have to set their internal performance standards at 100% compliance – they cannot sensibly plan to fail at some treatment works as this would not meet their legal obligations. Occasional failures are due to unexpected issues across a very large asset base, and improvements in this area are focused on understanding the root cause of failures (to prevent repeat failures) or monitoring and improving processes to restore compliance. We would never plan for 99% compliance in this area.

8.2.2. Serious Pollutions

716. We perform comparatively well against this measure, with one serious pollution incident in the last four years (2020-2024).

717. We reviewed Ofwat's industry historic performance data set, which shows an upper quartile performance of 0. However, this is driven by performance from WOCs which have far fewer sites and less potential for serious pollution incidents. If we were to exclude WOCs from the analysis, and focus on water and wastewater companies, the equivalent UQ performance over this period would be 1.5. The average performance over the same period for all WASCs and WOCs is 3.72 (we do not have WOC data for 2023/24).

718. We do not want to see any form of pollution into the environment, and we support setting this performance commitment at zero pollution incidents. However, this creates a downside skew in the incentive package that cannot be mitigated.

719. In the DD, Ofwat explains that they "avoid the use of deadbands… because we consider performance to be within company control and because they substantially weaken incentives on companies to improve their performance when they are close to their performance commitment level.[247]" At PR19 Ofwat **set a deadband** at 1 to prevent a large downside skew from their performance commitment and this package has been shown to drive downside skew across the sector. The same deadband should be set again.

720. This also does not weaken incentives on companies to improve their performance beyond one serious pollution incident. If a serious pollution incident does occur, companies will still be fined for this by the EA (and so a potentially harmful pollution incident does not go unpunished). Companies strive to avoid all serious pollution incidents and would not be able to create an investment plan that simply allows a single serious pollution incident to happen – so, it is not sensible to suggest that companies would be incentivised to allow a single serious pollution incident if a deadband were applied here.

[247] PR24 DD, Delivering Outcomes Appendix, p34

8.2.3. Compliance Risk Index

721. We note that Ofwat's modelling for ODI rates for CRI has impossible values in the distribution (that is, less than zero). This should be corrected in the analysis of RORE, as this is contributing to showing a symmetric risk distribution at DD. Ofwat should also set the same deadbands for all companies here, with no difference for companies who appealed to the CMA at PR19.

722. We do not agree with Ofwat's proposal to have a different deadband profiles for companies who appealed to the CMA at PR19. Whilst we support and have recognised and adopted the CMA's decisions, setting different rates for companies based on whether they chose to appeal to the CMA is clearly discriminatory. All companies should have the same profile applied, from 2 to a level of 1.0 in 2029/30, because they have the same balance of risk and return across all of the other parts of PR24 and there is only one notional company. The CMA set a different deadband from Ofwat's FD but could only do so for those companies that chose to appeal their determinations had all companies chosen to appeal then we are confident that the CMA would have adjusted all companies deadbands in this area. There should be no reason for Ofwat to continue to set different deadbands at PR24.

723. We set a target for the compliance risk index (CRI) at zero, in line with Ofwat's PR24 methodology which required us to do so. As we said in our business plan, the CRI stands out as an area of poor performance for the company and has attracted a large financial penalty. We are working on with the Drinking Water Inspectorate (DWI) on a large transformation programme to improve our CRI score – following a detailed hazard review, we identified a series of actions and associated timescales which we are meeting and following in line with our DWI commitments.

724. We support a deadband reducing from 2 to 1 across the AMP. This will mean a downside risk for us in all five years, as we assumed in our business plan, reflecting our need to improve in this area.

8.3. ADDRESSING ASYMMETRY: DOWNSIDE SKEW FOR C-MEX

725. We do not agree with Ofwat's proposed C-MEX methodology. In principle, making comparisons with other sectors outside of water is not an unreasonable thing to consider when assessing whether performance can be improved and we support more attention being given to UKCSI comparisons. However, the proposals as they stand create negative skew towards penalties for average water company performance and reverses the previous decision (at PR24 methodology) to set symmetric incentives for C-MEX in order to achieve a more symmetric package of ODIs. We also have some concerns about the use of the UKCSI data itself in terms of the volatility of the measure and the comparability of the overall measure including all sectors to England and Wales water.

726. To address these concerns we instead propose that:

- The UKCSI measure of customer satisfaction for each water company is used for the ODI as this promotes greater comparisons with other sectors and learning of best practice from them.

- But that the target is based on the median UKCSI measure of performance for water companies only. This will ensure that the incentive remains symmetric and that the target is achievable for water companies recognising differences with other sectors.

727. We think this alternative best meets the needs of PR24 and customers to encourage and promote best practice and improvement in customer service whilst ensuring that the measure does not worsen an already negatively skewed ODI package.

8.3.1. The C-MEX changes Ofwat proposes would introduce a clear and certain downside skew in the package which would need to be corrected

728. Although we are regularly one of the water industry's top performers for C-MEX – across the last four years we have always ranked in the top three – we would not achieve the UKCSI average in 2023/24, despite being third in the industry. Figure 33 shows our CMEX scores compared to the UKCSI average in each year.

FIGURE 33: NORTHUMBRIAN WATER PERFORMANCE AGAINST THE UKCSI AVERAGE SCORE.

	2020/21	2021/22	2022/23	2023/24
Northumbrian Water	85.76 (3rd)	84.46 (2nd)	83.74 (1st)	81.40 (3rd)
UKCSI Average	85.14	82.72	82.42	84.50

Source: NWL analysis of UKCSI data

729. We looked at this across the sector and, under Ofwat's new methodology, no company would have achieved a reward in 2023/24 (see Figure 34 below).

FIGURE 34: C-MEX ODIS AGAINST OFWAT'S NEW UKCSI AVERAGE MARKER FOR PERFORMANCE 2020-2024

	2020/21	2021/22	2022/23	2023/24
Affinity Water	Penalty	Penalty	Penalty	Penalty
Anglian Water	Penalty	Penalty	Penalty	Penalty
Bristol Water	Penalty	Reward	Penalty	Penalty
Dŵr Cymru	Reward	Penalty	Penalty	Penalty
Hafren Dyfrdwy	Penalty	Penalty	Penalty	Penalty
Northumbrian Water	Reward	Reward	Reward	Penalty
Portsmouth Water	Reward	Reward	Reward	Penalty
SES Water	Penalty	Penalty	Penalty	Penalty
Severn Trent Water	Penalty	Penalty	Penalty	Penalty
South East Water	Penalty	Penalty	Penalty	Penalty
South Staffs Water	Penalty	Reward	Penalty	Penalty
South West Water	Penalty	Penalty	Penalty	Penalty
Southern Water	Penalty	Penalty	Penalty	Penalty
Thames Water	Penalty	Penalty	Penalty	Penalty
United Utilities	Penalty	Penalty	Penalty	Penalty
Wessex Water	Reward	Reward	Reward	Penalty
Yorkshire Water	Penalty	Penalty	Penalty	Penalty

Source: NWL analysis of UKCSI data

730. This evidence clearly shows there would be an expected negative position for the average company. Moreover, if UKCSI scores for 2023/24 persist, then every single company could be subject to a penalty – even the top performers in the sector. This clearly creates a significant downward skew to penalties.

731. There is no evidence to suggest that it is achievable for water companies to close this gap, particularly given the enhanced rewards available in AMP7 to do so. There are likely to be structural reasons why companies cannot achieve it, and the fact that no company has been able to achieve this in 2023/24 suggests that this is not a realistic benchmark to set for the average or notional water company to meet.

732. This negative skew would be worsened even further if Ofwat dropped the “check and challenge” for phone surveys or moved to mostly digital surveys, as this will further degrade a survey approach which struggles to engage respondents and obtain relevant responses. Removing the online correction factor for digital surveys (as digital surveys tend to garner lower scores) will mean that scores drop further increasing the gap to UKCSI scores and would increase the expected penalties from the ODI. These aspects of the current methodology should remain in place to ensure that representative and robust scores for water are captured during AMP8. We have responded on this to previous C-MEX consultations, and it is still an important point which needs to be considered and taken into account.

733. This does not meet Ofwat’s criteria for targets to be achievable, and simply removes funding for retail operations – in the case of 2023/24, all companies would receive a reduction in their retail revenue to a level below efficient

expenditure (that is, up to 22.5% reduction, or the equivalent of about £9 per customer). We are proud of our high performance on providing an unrivalled customer experience, but these proposals could penalise industry leading performance which seems perverse. This effective automatic penalty would mean that on a self-standing basis the retail price control would not be financeable.

8.3.2. UKCSI average performance may not be a sensible benchmark

734. Whilst we regularly seek to benchmark our performance with companies outside the water sector and do use UKCSI ourselves already to drive improvement, we do not believe that the UKCSI average is a good determinant of a performance target for the water sector or indeed ready to be used for financial incentives in this way. UKCSI is a useful barometer of service and we actively use their principles of world class service in our ambition to be sector-leading and to gai insights, for example. However, this doesn't translate to it being a mechanism to determine large reward/penalty payments.

735. The proposed methodology for translating UKCSI into C-MEX benchmarks is very unpredictable, with large swings in the annual benchmark resulting from minor changes in UKCSI scores. This is created by small sample sizes in UKCSI, as well as more limited research periods which can create more volatility in scores.

736. There is also no reason to expect that water company customer experience is comparable with the UKCSI average. It is very noticeable that the specific utilities sector UKCSI score is significantly lower than the all-sector average (consistently around five points lower) which suggests structural differences between sectors. The fact that different sectors have different average scores does not necessarily reflect comparative performance – we have no reason to think that some sectors are inherently worse than others – but instead reflect the different nature of customer experience in each sector. For example, it is difficult to compare a customer experience of a utility company seeking to resolve issues such as an interruption to supply or power outages compared to an online retailer who is delivering a product to a customers' home.

8.3.3. Alternative use of UKCSI performance that would address the asymmetry

737. We understand the desire to make use of the UKCSI data as this promotes comparisons with other sectors and encourages adoption of cross-sector best practice. However, as set out above, we do not think it is appropriate to use the UKCSI average as the ODI target for water companies.

738. Instead we propose that:

- The UKCSI measure of customer satisfaction for England and Wales water companies is used for the ODI as this promotes greater comparisons with other sectors and learning of best practice from them. Publishing and focussing more on this data will act as a reputational incentive for companies to improve performance.

- The target is based on the median UKCSI measure of performance for England and Wales water companies only. This will ensure that the incentive remains symmetric and that the target is achievable for water companies recognising differences with other sectors.

739. We think this alternative best meets the needs of PR24 and customers to encourage and promote best practice and improvement in customer service whilst ensuring that the measure does not worsen an already negatively skewed ODI package.

740. If Ofwat is keen to compare water companies with an external benchmark then more work neds to be done in this area to construct a suitable benchmark. We suggest that Ofwat works with water companies and the Institute of Customer service to develop an appropriate benchmark that can be used to set a challenging but achievable target for better than average performers and in doing so recognises structural differences between sectors.

8.4. ADDRESSING ASYMMETRY: BASELINE PERFORMANCE

741. Ofwat should reconsider the level of baseline performance against several measures in the package, including PCC, interruptions to supply, and pollutions.

742. In each of these cases, Ofwat has made assumptions about the starting point for AMP8 based on historical targets and definitions rather than using actual performance, and this means that these do not match the likely future risks and challenges. This includes the impact of extreme weather.

743. A short First Economics paper[248] published alongside the DD's notes "...we do not agree with the logic of rolling over PR19 targets unchanged to 2025/26 in places where the sector as a whole has generally struggled to meet expectations that were set five years ago (e.g. on pollution, internal sewer flooding, per capita consumption). We view this as a form of extended punishment for a past collective failure to foresee during PR19 what the industry was capable of achieving with the cost allowances it was given, rather than a justifiable ongoing penalty for objectively poor performance."

744. The paper further suggests the regulatory framework should allow for a reset of the industry performance level into to the new price review period, i.e. 2025/26, so that the industry baseline performance reflects the actual improvements over the previous 2020-25 period.

8.4.1. Per Capita Consumption (PCC)

745. We accept the methodology Ofwat has applied to adjusted PCC targets in AMP7 due to the Covid-19 pandemic.

[248] NES93, First Economics – Performance Commitments and ODIs

746. However, the AMP7 targets were generally too stretching with most companies failing to achieve the Covid-19 adjusted PCL for 2024/25. Under the year 5 AMP7 target, all companies except one are likely to fail the PCL.[249] Although Ofwat's adjustment for Covid-19 increases this number of companies achieving the PCL to four,[250] this still means that thirteen companies will fail the PCL. Three of the four companies forecasting to achieve the Covid adjusted PCL in 2024/25 have a stretch that is below the industry average (5.9%).

FIGURE 35: INDUSTRY PERFORMANCE AND STRETCH IN AMP7

Company	AMP7 stretch % (pre-Covid adjustment)	2024/25 target v forecast performance	24/24 Covid adjusted target v forecast performance
Anglian	5.6%	Fail	Passed
Hafren	4.2%	Fail	Fail
Northumbrian	5.3%	Fail	Fail
Severn Trent	3.5%	Passed	Passed
South West Bournemouth	6.2%	Fail	Fail
Southern	7.2%	Fail	Fail
Thames	6.3%	Fail	Fail
United Utilities	6.3%	Fail	Passed
Welsh	6.3%	Fail	Fail
Wessex	0.9%	Fail	Passed
Yorkshire	8.9%	Fail	Fail
Affinity	12.5%	Fail	Fail
Bristol	6.3%	Fail	Fail
Portsmouth	6.3%	Fail	Fail
South East	7.2%	Fail	Fail
South Staffs Cambridge	0%	Fail	Fail
SES	6.6%	Fail	Fail

Source: NWL review of Ofwat's PR24 DD PCM Per Capita Consumption

747. This suggests that the 2024/25 targets set at PR19 were too stretching, as very few companies have been able to meet these in practice.

748. We need to acknowledge this issue when setting the baseline for PCC at PR24. As most companies will not achieve the Covid adjusted target for 2024/25, using the PR19 target performance as the baseline for further improvements in AMP8 would start most companies in penalty, and mean that they are likely to be in penalty over most of the AMP.

[249] NWL review of Ofwat's PR24 DD PCM Per Capita Consumption - https://www.ofwat.gov.uk/regulated-companies/price-review/2024-price-review/draft-determinations-models/
[250] NWL review of Ofwat's PR24 DD PCM Per Capita Consumption - https://www.ofwat.gov.uk/regulated-companies/price-review/2024-price-review/draft-determinations-models/

749. We propose instead that Ofwat should apply new baselines from companies' **actual performance** in 2024/25 (companies should still meet the proposed 2029/30 targets, but the glide path to this should start from a higher baseline). This should then be adjusted for non-delivered AMP7 water efficiency enhancements.

750. For AMP7 we have forecasted to achieve 66.1% of our smart metering enhancement case. The 33.9% not achieved accounts for a missed reduction in PCC of 2.05 l/p/d. We indicate that our baseline performance for AMP8 to be our forecasted performance less this 2.05 l/p/d. Annual performance for 2024/25 is forecasted at 148.6 l/p/d, therefore removing the additional 2.05 l/p/d, bring us to an annual of 146.6 l/p/d. This would set our new 2024/25 baseline as 151.0 l/p/d (3 yr avg).

751. We set out below the revised PCL for PCC. This uses the same stretching target in 2029/30 as in our business plan (and in the Ofwat DD), reflecting the target we still need to achieve by then, but a revised glidepath from the higher baseline means that the ODI will now be symmetric and the trajectory to 2029/30 will be significantly more achievable.

FIGURE 36: REVISED PCL FOR PER CAPITA CONSUMPTION (L/P/D)

	BASELINE	2025/26	2026/27	2027/28	2028/29	2029/30
ANNUAL	146.6	144.9	143.5	137.6	135.9	134.5
3 YR AVG	151.0	148.0	145.0	142.0	139.0	136.0

Source: Northumbrian Water Analysis

752. We agree with the proposed 2029/30 PCL of 136 l/p/d (three-year average).

753. Ofwat has acknowledged that base expenditure may not reduce PCC, with the draft determination indicating that they "do not expect companies to deliver PCC reduction from base expenditure."[251]

754. However, in our business plan, we assumed that some improvement would be delivered from base expenditure, and we allocated £13.9m to base expenditure to achieve this.[252] As we describe in NES15 Table 17 and 18, this base expenditure is expected to deliver 20.82 Ml/d of savings from water efficiency activities (across the North East and Essex & Suffolk combined).

755. Ofwat's water demand enhancement model[253] sets a unit rate for enhancement costs for water efficiency activities based on the benefit we had allocated to enhancement in our business plan (13.134 Ml/d, including NHH efficiency). If Ofwat does not expect companies to deliver PCC reduction from base expenditure, then the

[251] Ofwat PR24 Draft Determination – Delivery Outcomes for customers and the environment page 55. https://www.ofwat.gov.uk/wp-content/uploads/2024/07/PR24-draft-determinations-Delivering-outcomes-for-customers-and-the-environment.pdf
[252] NES15, Table 2
[253] PR24-DD-W-Demand-side-improvements, "modelled costs" sheet

additional 20.82 Ml/d of savings we expect from base expenditure should be allocated to enhancement expenditure through this model.

756. We have not changed these values in our revised business plan tables. This is because we do not think Ofwat's assumption about PCC reduction from base expenditure is quite right – all companies have expected that at least some improvement is required through base expenditure in setting their business plans, and so there is potential for at least some improvement from base.

757. Ofwat should consider this at FD and include additional enhancement expenditure through the model (by increasing the benefits expected when calculating final allowances) if they consider that improvements are not funded through base expenditure. We estimate that for Northumbrian Water, this would increase the enhancement allowance by £23m – though we note that this is more than the costs we had assumed in base (as the base interventions are selected first and so are the best value solutions).

8.4.2. Water Supply Interruptions

758. We are comfortable with the target for supply interruptions, which is set below what we proposed in our business plan (although several other measures have been set more tightly than our business plan).

759. The proposal by Ofwat to set a flat performance commitment at the median performance level of five minutes[254] must be considered in the context of historical industry performance. Updating the dataset Ofwat provided to all companies providing historical performance to reflect company performance in 2023-24 shows that Ofwat's choice of a median performance level using company plans for 2025-30 is actually tighter than an upper quartile target using historical performance.

760. If Ofwat wants to set a 'median' performance level it should re-consider the performance commitment for PR24, and review business plan submissions in the context of historical data. Overriding the business plan submissions "median" target with the industry upper quartile (linear) might be more sensible. The draft determination suggests that a middle company target was applied, which historical data indicates is more likely an upper quartile performance.

761. Figure 37 compares Ofwat's five-minute median performance against the median and upper quartile linear trends of performance using data between 2015 and 2024.

[254] Ofwat Draft Determination

FIGURE 37: COMPARISON OF OFWAT'S MEDIAN PROFILE WITH HISTORICAL INDUSTRY PERFORMANCE TRENDS (HH:MM:SS)

Methodology	2024/25	2025-26	2026/27	2027/28	2028/29	2029/30
Ofwat DD Median	00:05:00	00:05:00	00:05:00	00:05:00	00:05:00	00:05:00
Ofwat DD Mean	00:07:51	00:07:03	00:06:30	00:06:01	00:05:33	00:04:49
Historical Industry Linear UQ (2015-2024)	00:05:46	00:05:41	00:05:35	00:05:30	00:05:25	00:05:20
Historical Industry Linear Median (2015-2024)	00:08:06	00:07:41	00:07:17	00:06:53	00:06:29	00:06:05
Historical Industry Linear Mean (2015-2024)	00:19:01	00:19:48	00:20:35	00:21:11	00:22:10	00:22:56

Source: Northumbrian Water Analysis

762. There are also some risks in using the median at all for this performance commitment, because this measure has shown to be very volatile, and we have seen large increases in a single year from particularly large bursts and extreme weather.[255] This means that the median is not a particularly good indicator of P50 performance because the distribution is so skewed – this can be observed in 2022-23, where the highest three companies failed the 05:45 minute target with results of 3 hours and 2 minutes, 1 hour and 28 minutes, and 38:45 minutes.

763. This does not mean that the median should not be used as a reasonably stretching target – but it does mean that using this as the P50 assumed performance leads to a very large downside skew in ODIs, since it is likely that most companies will have a very disproportionate failure in at least one year.

764. Ofwat should consider reintroducing extreme weather exceptions to the performance commitment, or a tighter cap to financial penalties, to mitigate this very large downside skew.

765. Ofwat could alternatively set the performance commitment at a higher level – for example, at the mean of historical data – to reflect that this is the P50 expected performance level. However, we consider a tighter penalty cap or extreme weather exceptions would be more appropriate as this would reduce the downside risk from extreme events without making companies appear to outperform in most years.

766. Finally, we note that there is already an alternative way to tackle performance in these events, namely taking action against other companies who do not respond adequately to supply interruptions. This can include examining the root causes and assessing if company performance or other factors are to blame – rather than the blunt instrument of a potentially very high downside ODI.

767. We agree with our customers' view that Ofwat should not introduce a severe weather supply interruptions measure at this time. At PR19 we included an interruption over 12 hours measure with performance varying over the AMP, which clearly linked years with more violent storms (e.g. Storm Arwen) to those with worse performance. In response to this we proposed an enhancement case to improve our power and flooding

[255] For example, Ofwat's Water Company Performance Report 2022-23 shows several very large outliers.

resilience, which included specific activities to reduce interruptions related to power networks outages. Ofwat rejected this enhancement case in full.

768. We carried out customer research using a large online quantitative survey and smaller qualitative People Panels. Not enough customers supported the inclusion of a financial incentive. Only 61% of customers agreed the measure should be included and a financial incentive applied, which was lower than the 70% threshold we set for inclusion based on the lower end of the 70-75% threshold applied from CCW's PR14 research. Our independent challenge group supported the results of the customer research related to our interruptions to supply 12 hours measure, resulting in the removal of this measure for PR24.

8.4.3. Total Pollutions

769. We have been one of the better industry performers on pollutions across the 2020-24 period.

770. According to Moody's analysis the Pollutions ODI is the single biggest driver of downside asymmetry in the DD. We do not agree with Ofwat's 2024/25 base performance to which the EA WISER 30% reduction is applied to set a target of 13.65 pollutions per 10,000km of wastewater network by 2029/30.

771. The baseline 2024/25 performance set by Ofwat is 19.5. This reflects the performance commitment from AMP7 for that year. However, since the PR19 determination, the industry has not been able to sustain the reduction in numbers of pollution seen prior to 2020. Across 2020-2024 the industry UQ has risen from 20.78 in 2020/21 to 27.07 in 2023/24. No company in 2023/24 had a performance better than the target for 2024/25.

772. Given the trend in performance it is unlikely any company will meet this target of 19.5. There are two main reasons why the industry will be unable to meet the baseline target.

- Investment made by companies to increase the monitoring across the network provides better information around when spills are occurring, increasing self-reporting to the EA. In our enhancement case NES37, we explained that the EA has introduced new statutory requirements for monitoring in WINEP, and we expect them to update their pollution reporting guidelines to reflect the greater granularity of data from monitors. We expect that the definition and methodology for calculating pollution incidents will change.
- Pollutions have increased due to outages from the power networks linked with storms and climate change. We demonstrated this in our enhancement case NES32 (Ofwat disallowed this enhancement expenditure at DD) in relation to improving our power resilience, which has a large impact on pollution incidents. We detail our response in relation to this further in section 1, climate change adaptation.

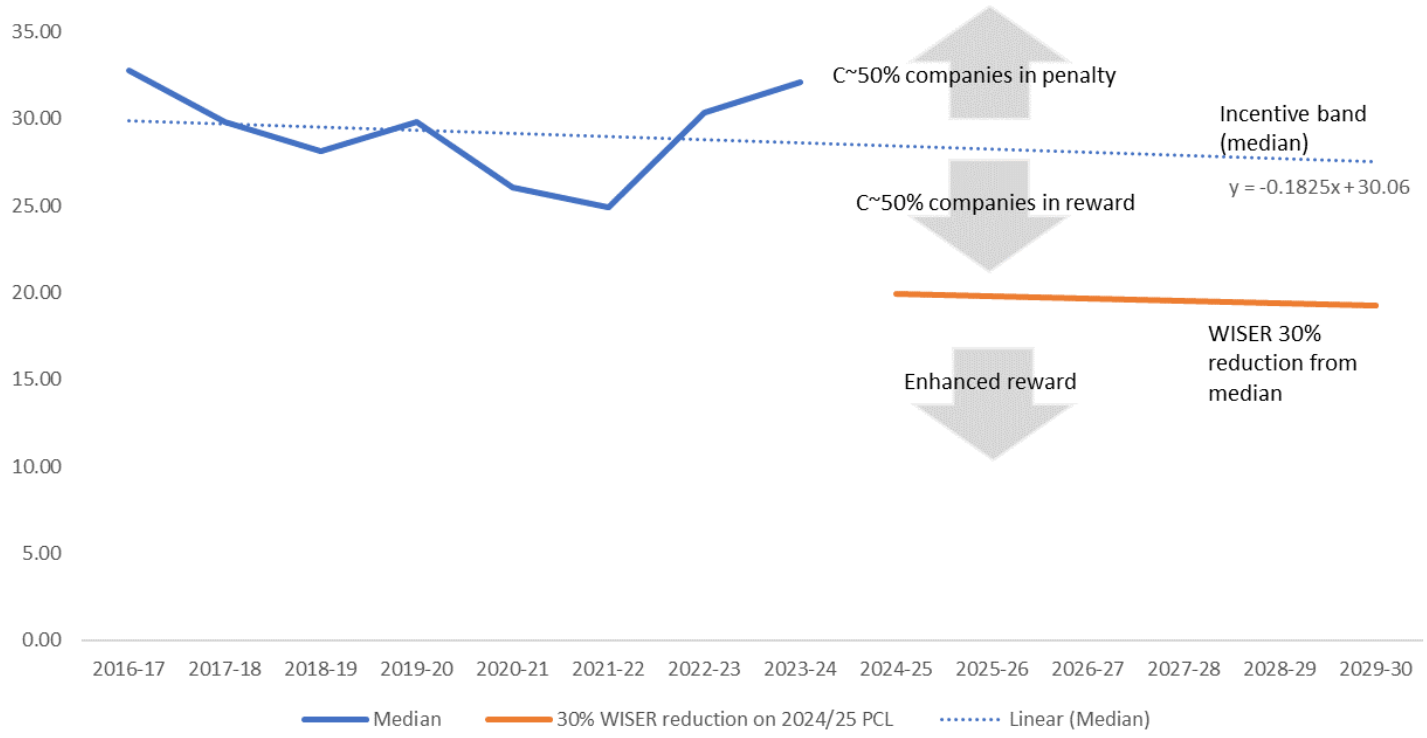
773. Using the 2024/25 performance commitment as the baseline will mean a significant downside skew from this ODI, as the targets for 2024/25 will not be achieved (despite the incentives already in place in AMP7). This is a similar situation to PCC, where the targets set at PR19 have turned out to be overly ambitious, in practice.

774. We recognise that the WISER requirements demand a 30% reduction and we also want to see the sector improve in this area but the DD proposals will drive very material asymmetric skew. Instead we propose that Ofwat develops a graduated target where the financial reward or penalty incentive is applied before the 30% WISER target is reached but the 30% reduction target is maintained. Ofwat could:

- Develop a baseline target using an extrapolation of the industry historical median performance from 2016/17 to 2023/24, which equates to a 2029/30 PCL of 27.24. This performance is something achievable for the notional company, unlike the 30% reduction from the 2024/25 PCL, which companies are extremely unlikely to achieve.
- Develop a second target by applying the WISER 30% reduction requirement to the baseline target using the industry median above.
- Ofwat could then apply positive rewards to companies that were able to move beyond the first baseline target but retain the 30% WISER reduction target beyond which enhanced rewards could be applied. We demonstrate this in Figure 38.

775. Although WISER requires a 30% reduction on 2024/25 targets, even the WISER guidance acknowledges that “there may be some variation on our expectation depending on company performance during the current asset management plan period”. Accepting a higher starting baseline position would significantly reduce the downside skew from this performance commitment.

FIGURE 38: POLLUTIONS HISTORIC AND PROJECTED PERFORMANCE



Source: NWL Analysis of Historic Industry Data and application of 30% WISER reduction.

FIGURE 39: OFWAT DD PCL AND PROPOSED TARGET BASED ON INDUSTRY DATA TO 2023/24

Methodology	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30
Ofwat Draft Determination		19.50	18.33	17.16	15.99	14.82	13.65
Industry UQ Linear Trend 2020-2024	27.07	27.44	29.24	31.04	32.85	34.65	36.46
Industry Median Trend 2016-2024	32.12	28.22	28.02	27.82	27.63	27.43	27.24
Industry Median 2016-2024 less 30% WISER	32.12	28.22	26.52	24.83	23.14	21.45	19.75

Source: Northumbrian Water Analysis

776. Our proposed PCL remains challenging particularly in light of Ofwat's rejection of our enhancement related to power and flooding resilience, in which we had proposed to invest in mitigating the effect of power grid outages. We discuss our response to the DD on power and flooding resilience in section 1. Ofwat also rejected our enhancement case (NES37) which set out the need for increased expenditure to meet new requirements from increased monitoring. Both of these investments aimed to reduce the upward pressure on this performance commitment.

8.5. ADDRESSING ASYMMETRY: CLIMATE CHANGE RESILIENCE

777. In section 1 we outline our response to Ofwat's Draft Determination decision to reject our enhancement case related to climate change impacts. In response to this, without the funding associated with the enhancement case in our original business plan, it is very unlikely that we will be able to meet the PCL set by Ofwat over AMP8. Should Ofwat continue to decide not to fund our enhancement cases, an exception for extreme weather should be applied to a number of measures detailed in the Frontier Economics' paper[256]; these include: "supply interruptions, leakage, mains repairs (bursts), internal and external sewer flooding, per capita consumption, pollution incidences, discharge permit compliance, bathing water quality, river water quality, storm overflows, unplanned outage and sewer collapses)." We propose the below exclusions text for performance commitment definitions.

778. "Any PC Measurement Unit count that results from an extreme weather event or electricity supply interruption is considered to be outside the parameters of the performance commitment and shall not be included.

779. For the purposes of this exclusion, extreme weather events include weather connected with a Meteorological Office Amber or Red Warning, an Environment Agency extreme weather warning and/or:

- an ordinary or emergency drought order;
- wind speed greater than 1 in 50-year return period level;
- drought more severe than 1 in 200-year return period level;
- combination of drought more severe than 1 in 50-year return period level with temperatures exceeding 1 in 100-year return period level;
- temperatures below 1 in 50-year return period level;
- rainfall in excess of 1 in 50-year return period level;
- river flooding greater than 1 in 100-year return period level, and/or
- coastal flooding greater than 1 in 200-year return period level."

8.6. ADDRESSING ASYMMETRY: BUSINESS DEMAND

780. We strongly disagree with the PCL for business demand in Ofwat's DD.

781. **Ofwat should set a target for business demand reduction consistent with DEFRA's target of reducing business demand by 9% by March 2038.** Ofwat's DD reduction of 16.4% (3 year average) (15.8% in the North East and 17.5% in Essex & Suffolk) from a 2024/25 baseline is simply not achievable. The reduction by Ofwat is significantly higher than the DEFRA target and is also to be delivered in less than half the time.

[256] Frontier Economics, Extreme Weather Event Risk, pages 45-46, Extreme_weather_event_risk_report.pdf (ofwat.gov.uk)

782. This leads to an estimated P50 of a £35m penalty over AMP8 – this is **three times as much as our total expenditure allowance** for non-household water efficiency and metering. This is clearly not reasonable.

783. The reason for this extreme target is simply the calculation of non-household growth in the performance commitment. Ofwat applies a generic adjustment to business demand relying on historical data trends rather than the much more detailed forecasts we developed from best practice, including models and consultation with local authorities and large and new users. Our WRMP shows very clearly that increasing business demand, particularly in the Suffolk area and on Teesside, is driving the need for new water resources. Ofwat's method to determine the business demand targets does not satisfactorily predict the future needs of the existing and new businesses in our regions.

784. We are further concerned the impact of such a large reduction may have on our business customers in our regions. Both the North East and Suffolk regions are expected to see increases in industrial activity, which contribute to economic growth – and under our WRMP we already expect to see some short-term restrictions in growth. This PC would simply incentivise us to seek to restrict growth in our areas (activities to do this would have six times as much impact on the performance commitment than activities to tackle water efficiency). This is clearly not Ofwat's intention.

785. **Ofwat should use our WRMP forecast for non-household growth** as there is more evidence to support this, and it removes the large downside ODI impact created from imposing a new forecast for business demand growth. Ofwat has proposed an end-of-period adjustment for business demand growth. This means that there is no particular reason to intervene to apply a different forecast than WRMP (and a much less likely forecast, as Ofwat has at DD) for business demand growth when setting this performance commitment. Customers will be protected from any material differences between outturn and forecast.

786. We note that historical data is not a good sole reference point on which to estimate future water demand. In their report forecasting NHH demand for our business plan, Artesia notes that the period from 2017 onwards has seen a number of changes in the non-household sector, with the market opening to competition, Covid-19, Brexit, and the cost-of-living crisis[257] and the loss of some large customers. All of these factors undermine Ofwat's assumption that historical data is a good predictor for future performance.

787. A new forecast of growth for NHH demand would require significant changes within our WRMP, as this was used to develop our Best Value Plan to address supply demand shortages. In Artesia's analysis of our plan and Ofwat's DD, they say:

> "NWL's best value WRMP aims to ensure that there is sufficient water available for new industry and business growth in its regions. It cannot be correct to alter the final plan profiles for NHH demand based

[257] NES85 Artesia NWL PR24 DD Support – NHH Demand PCL DD Analysis

> on a fundamentally flawed assumption of future growth, because this would then result in a plan which is not best value."[258]

788. Ofwat replied to our statutory WRMP consultations, including business demand growth forecasts, and so we are disappointed that they did not raise any concerns with our forecasts earlier.

789. Ofwat's methodology outlines that base expenditure is to maintain the 2024-25 baseline, preventing a deterioration in performance.[259] The value of enhancement expenditure allowed by Ofwat is not enough to achieve such a large reduction in business demand, with a much lower benefit allocated to this enhancement case.

790. It is highly likely that our efforts to reduce business consumption will be more difficult than PCC. Although water companies can highlight the benefits of reducing consumption to both household and business customers, it is their choice to make the reduction. For businesses, this may require changing process or changing the behaviour of all employees. A further issue with businesses is ensuring the contact of the relevant person within the organisation that will engage with our team or a retailer on our behalf. Ofwat has already noted issues of an increasing number of companies with "do not contact" in relation to their surveys to assess D-MEX, which they propose to move from monthly to annual due to survey fatigue.[260]

791. **The ODI for business demand should accumulate annually (that is, calculated and committed to), but be paid at the end of the period, once the adjustment for growth has been agreed.** This supports companies in understanding payments that might be available for further improvements in-period (rather than having uncertainty until the next price review). Ofwat should take submissions and provide an assessment for growth annually, to allow companies to better understand its annual position in terms of risk and reward associated with this measure. We further recommend that Ofwat uses the Retail Wholesale Group to clearly set out what data and information is required annually to determine levels of business demand growth. An early and clear steer for companies will ensure that companies can provide annual growth assessments to Ofwat that are outside the PCL set.

792. Alternatively, we would recommend the ODI be calculated on the water efficiency activity achieved in the reporting year instead of the reduction in business demand. Meter readings with businesses pre and post water efficiency activity would provide a clear assessment of activity, but also remove the uncertainty around business growth. Combined with promotions of grey water harvesting or water recycling for businesses applying for new or increases in potable water supply would ensure a reduction in business demand.

[258] NES85 Artesia NWL PR24 DD Support – NHH Demand PCL DD Analysis
[259] Performance from base expenditure (Business Demand) page 95 - https://www.ofwat.gov.uk/wp-content/uploads/2024/07/PR24-draft-determinations-Delivering-outcomes-for-customers-and-the-environment.pdf
[260] Ofwat D-MEX Survey Methodology page 29 https://www.ofwat.gov.uk/wp-content/uploads/2024/07/PR24-draft-determinations-Outcomes-Measure-of-experience-performance-commitments-appendix.pdf

793. In Figure 40, we have set our business demand PCL related to Ofwat's definition, to the ambitious level outlined in our business plan (business demand in relation to existing customers)[261], resetting our baseline performance which includes updated 2023/24 data[262].

794. We do not agree with Ofwat's assessment of a baseline set at 205 MLD as a three-year average by rolling forward 2022/23 performance over the remaining two years of AMP7, though we understand they did not have updated performance figures for 2023/24 at that time. However, due to our forecast growth between 2022/23 and 2024/25, we are unable to maintain a business demand of 205 over the remaining years of the AMP. For 2023/24 we report a growth to 209 MLD, whilst we are forecasting a further growth to 226.7 MLD in 2024/25. This further demonstrates that Ofwat's forward looking growth forecast is not appropriate.

795. We expect our business demand to grow to 226.7 MLD in 2024/25 based on our demand forecast. These forecasts were built considering a number of factors previously noted, including liaison with businesses across the regions. The forecasted 226.7 MLD include the change whereby businesses are starting to return to pre-Covid levels (pre-Covid demand was an average of 218 MLD), and a number of specific examples of extra demand for 2024/25:

- Teesside works provided an estimate of potable water demand required over the short term. They informed us of the needed increase in potable water demand in 2024/25 of 8 MLD from our baseline.
- An additional 2.04 MLD required to service a gigafactory in our Washington area.
- Additionally in 2024/25 and over the next AMP we are undertaking work to reduce our Gap Sites to ensure business have meters and are being read to ensure the consumption is clear in our water balance. We expect that this work will lead to an increase in the level of business demand over the next AMP.

796. Since building our forecasted level of business demand, we have received contact from two data centres in our Essex region estimating an additional 5-10 MLD potable water use. We anticipate we will receive further requests for additional demand over the next AMP.

797. Applying the 2024/25 annual 226.7 MLD to our three-year average, gives a baseline position of 213.6 MLD, to which we apply the reductions excluding growth as in our business plan.

FIGURE 40: BUSINESS DEMAND EXC GROWTH PCL 2025-2030 (MLD)

	Baseline	2025/26	2026/27	2027/28	2028/29	2029/30
3 yr avg	213.6	213.2	212.5	211.7	210.6	209.8
% reduction (3 yr avg)		0.2%	0.5%	0.9%	1.4%	1.8%

Source: Northumbrian Water Analysis

[261] NWL Business Plan – Outcomes Appendix, page 118 https://www.nwg.co.uk/globalassets/business-plan-2025-30/nes05.pdf
[262] Updated 2023/24 data is provided in our OUT tables.

8.7. RE-PROFILED PCLS

8.7.1. Bathing Water Quality

798. We include a re-profiled target which takes into consideration our historic performance and the updated guidance and information from both Ofwat and the Environment Agency – including an additional bathing water. This updates our business plan target. We have **not changed our approach or level of ambition** in this area – this simply reflects the changes in specific bathing waters and definitions.

799. In responding to Ofwat's query in January 2024, we revised our forecast performance to match the eligible bathing waters under the EA's guidance. At this time, we indicated we had a reduction of one bathing water from our current list, removing Low Newton. This bathing water was previously determined as "excellent", and as a result reduced our proposed PCL for the next AMP.

800. After this Ofwat query response, for the 2024 reporting year, the EA has now designated an additional bathing water in our area, Littlehaven.

801. To date we have worked with South Tyneside Council and the Environment Agency on the proposal to designate Littlehaven Beach. This included highlighting some of the challenges of undertaking an investigation to understand the sources of bacteria impacting bathing water quality at a newly designated site, as well as putting in place the required investment to improve quality to meet the Bathing Water Regulations 2013 (i.e. minimum Sufficient class).

802. We have reviewed Littlehaven using the EA's Bathing Water Classification Calculator and have determined its classification as "Poor". This agrees with correspondence from our local EA to the South Tyneside Council beach manager.

803. Since Littlehaven successfully gained designation as a coastal bathing water, the EA has included new holding lines in our AMP8 WINEP for an investigation and any improvements (both in the 2025-30 period).

804. We have developed the scope and costs for a WINEP investigation to understand the sources of bacteria impacting Littlehaven and to apportion them (e.g. wastewater, agricultural, urban run-off, misconnections). This will be used to inform the scheme to improve the bathing water at PR29. Until we have a clear understanding of the performance and impacting sources of bacteria for this bathing water, we do not expect to be able to include investment to improve the beach in our AMP8 WINEP.

805. We have included the costs for the WINEP investigation in our ADD15 table under the driver BW_INV2, but have not included any costs for a bathing water intervention here.

806. Our performance in 2023 (80.58%) deteriorated slightly from 2022 (81.58%). This was primarily as a result of the bathing waters in the Seaham area moving to sufficient class (under the new definition). Our APR for 2023-24 said that:

> "The classification has been significantly impacted by poor results since the 2019 season all linked to rainfall. We undertook a WINEP investigation at Seaham Hall to understand what improvements would be needed to our assets alone to achieve a robust classification of 'Excellent'. The classification is affected by a non-NWL source of bacteria which is likely to be from an unnamed drainage ditch adjacent to the sample point. Improvements to our impacting assets alone would not deliver a robust 'Excellent' status without significantly reducing or removing the local non-NWL source. We continue to work in partnership with the EA and local authority to investigate the reasons for the deterioration in bathing water quality at Seaham Hall including additional sampling and monitoring. Initial results show significantly elevated bacteria levels in the unnamed drainage ditch linked to non-NWL sources."

807. The inclusion of Littlehaven, classified as "Poor" and the continued forecasted "Sufficient" status of Seaham and Seaham Hall bathing waters, reduces our forecast performance to 76.24% in 2024. Littlehaven bathing water impacts our score throughout AMP8.

808. We accept Ofwat's interventions for Tynemouth Cullercoats and Beadnell bathing waters.

809. We do not accept Ofwat's interventions to categorise both Seaham and Seaham Hall bathing waters as "Excellent" between 2024 and 2029. We note both these bathing waters are expected at best to be "Good". As we note earlier, in 2023 both the Seaham and Seaham Hall bathing waters were categorised as "Sufficient" under Ofwat's definition (Ofwat's class), and we forecast this to remain the categorisation for 2024.

810. The Seaham bathing waters have displayed an upward trend of intestinal enterococci between 2021 and 2023 which has caused the bathing water to drop to "Sufficient" (Ofwat's class). Seaham Hall bathing water adjoins Seaham on the same stretch of coastal beach. We are actively investigating the trend at these sites with the EA and the local authority[263].

811. In our AMP7 WINEP investigation report[264], predominantly concerning Seaham Hall bathing water but also including Seaham Beach due to its proximity; the conclusion is that an unknown local source is impacting on these bathing waters and the modelled forecast for both beaches is "Good". Removing all NWL sources for Seaham Hall would not allow the bathing water to reach "Excellent". The advancement is reliant on non-NWL sources likely from either or a mix of surface waters from urban diffuse, private discharges and agricultural diffuse. The results of this study were reviewed and agreed by the EA in our WINEP.

[263] Bathing Water Action Plan for Seaham.
[264] NES84 AMP7 Coastal Investigations – SN021/0226/2.1.1

812. We have proposed to improve our assets in the area under our SO-DRP target of two spills a bathing season in AMP9 under the EnvAct_IMP3 WINEP driver, which sees six bathing water Storm Overflows being improved. Our modelling suggests this could move Seaham Beach towards “Excellent” classification in AMP9.

813. We do not expect to see the categorisation of both bathing to be higher than “Good” across AMP8.

814. As a result of the new designation, and above changes, we re-forecast our PCL for the period 2025-2030 in table OUT5. This sets our commitment to achieving a score of **85.12% in 2029**. We also include a copy of the NES BWQ tab from Ofwat’s PR24-DD-PCM Bathing Water Quality model[265], which indicates each bathing water by grade.

8.7.2. River Water Quality

815. In February 2024, we asked Ofwat to clarify the methodology for calculating the River Water Quality PCL, as we had noticed we had done this differently to many other water companies. On receiving a response from Ofwat, we have revised our PCL for AMP8 to match the method that Ofwat now expects.

816. We sent revisions to our commitment, including guidance to the changes made, to Ofwat in early July 2024.

817. The letter indicated that whilst we revise our PCL to align to Ofwat’s guidance, the underlying activities we will carry out to tackle phosphorus and river water quality have not changed. The PCL simply reflects the slightly different calculation method.

818. We have also been able to include phosphorus removal associated with our planned partnership working, which had not been included in the table before. However, as we note in our letter to Ofwat, the loads associated with our partnership working are trials and success is not guaranteed. As such, we would like Ofwat to include some flexibility in their determination of our river water quality commitment, and to consider how the performance of trials for nature-based solutions and partnership working might need to be reforecast once we are further into delivery of these trials.

819. As a result of revising our methodology to align with Ofwat’s, our 2029/30 PCL has reduced from 7% to a 5% reduction. However, in 2030/31 we see an improvement from a 20% to 58% reduction. This performance in 2030/31 relates to our WINEP enhancement schemes being delivered by the close of 31st March 2030 and the subsequent benefit is gained in 2030/31.

820. We have updated OUT5 with the new profile for River Water Quality associated with our methodology outlined in our letter to Ofwat[266].

[265] NES86 NWL Bathing Water Re-forecast – Red text indicates updates to 2023/24 actuals and forecasts from 2024/25 onwards
[266] Letter NES to Ofwat updating on RWQ PC (July 2024)

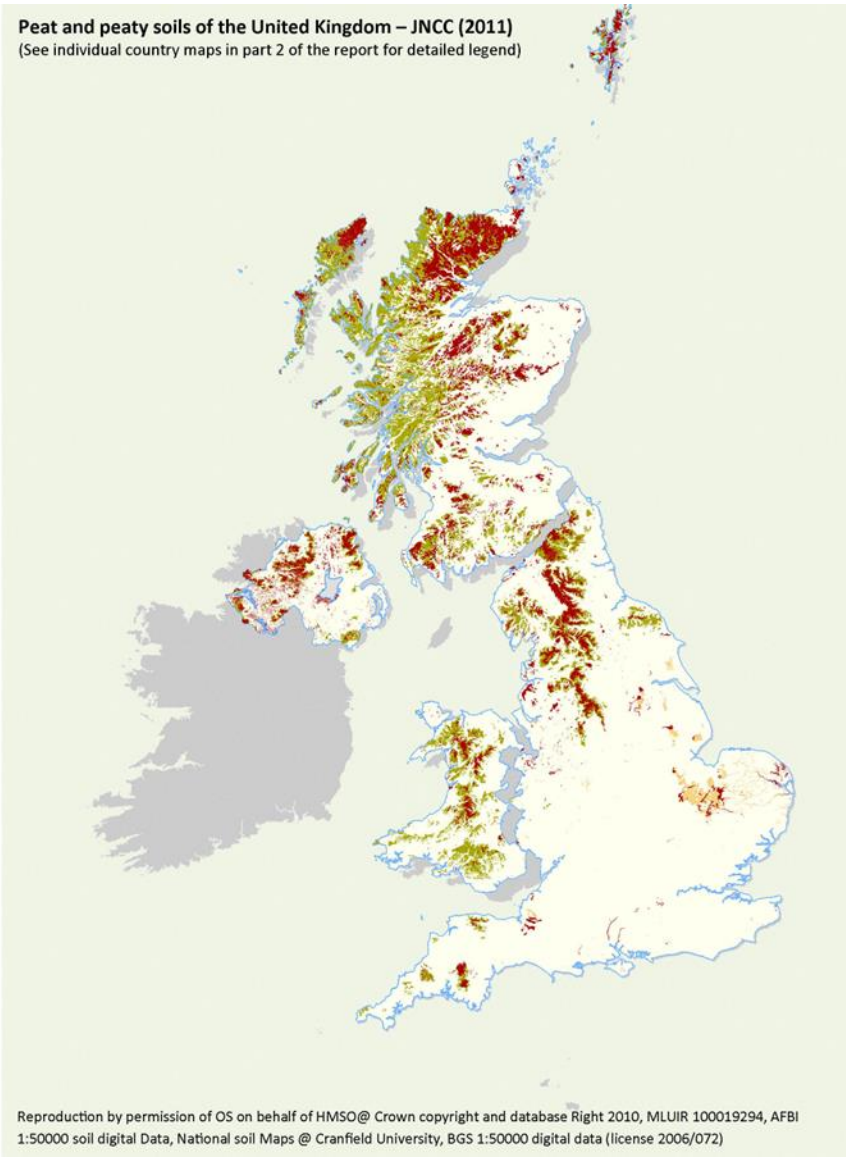
8.8. WATER QUALITY CONTACTS

821. We are pleased to see Ofwat accept our ambitious target for water quality contacts. The proportion of appearance to taste and smell contacts currently greater than 4:1. To improve our performance we need to see a significant drop in the number of contacts related to appearance.

822. The reduction of appearance contacts is very challenging for us as our Northern and Suffolk regions in particular contains a large amount of peat, which contains higher amounts of dissolved organic carbon (DOC) in it (approx. 40% compared to 10% in soil) in some areas, which is a key driver in colouring the water in our service areas.

823. The Joint Nature Conservation Committee publish a map of peat and peaty soil in the UK, which clearly shows those regional water companies that are likely to see high levels of dissolved organic carbon in water.

FIGURE 41: PEAT AND PEATY SOILS ACROSS THE UK[267]



Source: Joint Nature Conservation Committee, 2011. Towards an assessment of the state of UK Peatlands, JNCC report No.445

824. From the above map, we would expect to see higher rates of contacts from customers in relation to appearance due to dissolved organic carbon across Welsh, Hafren Dyfrdwy, United Utilities, and ourselves. Historic data supports this, with the latest 2022/23 average level customer contacts regarding water quality per 1,000 population was 0.97 excluding the above companies, whilst including those companies it increases to 1.12[268].

[267] Towards an assessment of the state of UK peatlands (jncc.gov.uk)
[268] NWL review of Ofwat Historical Data set V3

825. There is a correlation between the companies with proportionally higher levels of appearance contacts and the water resources that are impacted by organic carbon leaching from peatlands. This is due to the Appearance - brown/orange/black contact category. This is something we have been researching with Sheffield University and have participated in the PODDS (Prediction of Discolouration in Distribution Systems) programme since 2006. Through this research programme we now understand that the organic carbon creates the right environment for discoloured water to be created when flow or pressure changes occur in piped networks. We have used the learning from this research to improve performance with this important customer measure. This is something we will continue to do, however, without significant investment to enhance treatment works with more intensive processes and to replace all iron pipes in distribution systems discoloured water will continue to occur in these naturally soft water areas. From research conducted so far it is anticipated that Climate Change will exacerbate organic carbon release from peatlands and future improvements are not guaranteed. New treatment works in these areas should be future proofed and designed to treat the anticipated water quality. Not the historic water quality.

826. We have been working across water catchments, water treatment works assets and the piped network system, both trunk and distribution mains. We have been restoring peatland since 2010 with Pennine PeatLIFE, undertaking re-wetting, replanting and grip blocking. However, the restoration process is slow, and the evidence so far is of localised improvements in water quality, there are no watershed scale improvements published to date.

8.9. STORM OVERFLOWS

827. As we describe in section 7.8.2, we propose to revise our PCLs for Storm Overflows across the next AMP.

828. We have increased Ofwat's base efficiency challenge to reduce storm overflows from 5% (in the DD) to an increased level of 7.15%, as demonstrated in 11.1.

829. We have added an additional 79 storm overflows to our planned enhancements - ten through WINEP, and we have proposed an additional 69 overflows in addition to WINEP. We explain these in more detail in section 11.1.1.

830. The overall effect of these changes now means that we are targeting a lower level of average storm overflows of 14.00 by 2029/30, consistent with the best performance in the sector.

FIGURE 42: NEW STORM OVERFLOWS PCL FOR 2025-2030

	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30
Base	20.00	19.80	19.60	19.26	18.91	18.57
Base plus Enhancement	20.00	19.33	18.11	16.74	15.36	14.00

Source: Northumbrian Water Analysis

8.10. BIODIVERSITY

831. We disagree with the proposed financial ODI for biodiversity. We have a significant concern that the proposed approach to the biodiversity PC will incentivise ecologically illogical behaviour. By setting a median target, behaviour is likely to shift to prioritise short-term thinking to deliver quick wins rather than doing what is ecologically appropriate.

832. This likely short-term thinking will be further exacerbated by setting the baseline to zero at 2024/25, the lack of flexibility for additional surveys and reporting of change, and due to the lack of information informing the future trajectory of this PC.

833. Having an average 41% efficiency applied to the underlying Biodiversity Enhancement allowance adds to the likely drive to poor ecological decisions (See **PR24CA43 - W - Biodiversity** 'Allowances' tab).

834. The proposed approach will incentivise water companies to focus on biodiversity improvements that can be delivered quickly. Generally, these will be habitats with lower ecological value. Higher value habitats (eg ancient woodland, peatland) will not count towards the delivery of the proposed PC until they are sufficiently mature. Because of the financial loss caused by this delay through the proposed ODI, land that could be used to deliver higher value habitats in the longer term will likely instead be diverted to lower value habitat creation with a lower value to society and the environment.

835. We do not think a financial ODI is needed because biodiversity improvements are required and incentivised through means outside of Ofwat's regulatory remit:

- any development that requires planning permission must deliver at least 10% Biodiversity Net Gain (or more, dependent on local planning authorities);
- biodiversity improvements can be delivered and funded through the sale of biodiversity units on the open market, and
- biodiversity can also be improved through other funding mechanisms e.g. woodland grants and incentives.[269]

836. A better approach to promoting biodiversity in 2025-30 would be to allow these existing routes – that are still relatively new and novel – to have time to bed down. Setting a reputational incentive would enable us to track progress and build our understanding of the contributing factors to biodiversity improvements.

837. So, Ofwat should set a PC with a reputational ODI for biodiversity for 2025-30.

838. Putting in place a reputational ODI would allow time for it to be properly determined if there is an industry wide target that can be applied, and if not, what specifics need to be taken into consideration to provide targets against

[269] See **Woodland grants and incentives overview table - GOV.UK (www.gov.uk)**, Forestry Commission, 18 July 2024.

which performance can be appropriately compared at a company level. This could include consideration of the baseline biodiversity value of a company's landholding, what percentage is already protected or considered wildlife rich; how easily can changes to tenanted land be made; what are the appropriate land use changes in a given company area; how can interventions add to local nature recovery plans. Consistent approaches to data and baselining could be assured, providing a more robust point from which to reward/penalise future work.

839. A reputational ODI with reporting of progress made to deliver biodiversity improvements would enable companies to focus on creating the right habitats in the most beneficial places. Reporting would need to include not just biodiversity units delivered, but land in the process of being matured into these higher value habitats. It would also allow data to be collected to inform the on-going additions to base cost that will arise from increasing the biodiversity value of the water company's landholdings, and provide an opportunity to work with off-site land owners to agree what mechanisms will work for them to ensure longevity of any interventions.

840. It is important that the water industry is recognised for the work it does to deliver for biodiversity, and also that this is supported, continued, and where possible increased. A reputational PC for AMP8 would provide time to work with stakeholders to ensure any future PC and ODI recommendations promote the correct ecological behaviour to ensure the sector continues to deliver real biodiversity gains.

841. If a biodiversity PC with financial ODI is implemented, we consider significant changes are required to the existing design, as set out in Figure 43. We welcome the corrections made to the calculation of performance levels Ofwat has already made to the draft determination following company queries.[270]

FIGURE 43: DESIGN ISSUES AND POTENTIAL SOLUTIONS FOR THE BIODIVERSITY PC AND ODI

Issue	Solution
Potential for biodiversity improvements varies significantly across companies. The potential for delivering improvements depends on companies' land holdings (not the area they serve) and the progress they have already made to date in making biodiversity improvements to their land holdings. A target based on the median is arbitrary and gives no consideration to the amount of company land available on which biodiversity improvements can be delivered. Such a target also penalizes companies – including NWL – that have historically managed their landholdings to deliver for nature as they have more limited scope to deliver improvements. Currently 37% of our terrestrial land holding is in some form of conservation management.	**Use the targets for biodiversity improvements included in water company business plans.** These have been developed by companies based on what is actually deliverable and so represent a stretching but achieve set of target levels of performance. We therefore consider using company proposed targets would be a fairer way of setting targets for biodiversity improvements than using the median of company targets.

[270] See https://www.ofwat.gov.uk/wp-content/uploads/2024/08/PR24-DD-PCM_Biodiversity-V1.1.xlsx updated 8 August 2024.

Issue	Solution
No consideration appears to have been given to data provided to Ofwat on wildlife rich areas, and designated sites in the setting of this PC. To deliver targets beyond our proposals we may have to take large areas of arable land out of food production, which goes against broader UK food security objectives.	
The biodiversity ODI only funds performance above the PCL (or reduces revenue for performance below the PCL). The PCL is not funded through the ODI. This level of delivery therefore needs to be funded elsewhere in the price controls.	**Use the targets for biodiversity improvements included in water company business plans.** The performance included in our proposed PCL (0.23 BU/100km^2 for 2029/30) is based on the wider environmental outcomes that we can deliver from our WINEP programme and is therefore funded. Assuming that other companies have adopted a similar approach, using company proposed targets will avoid unfunded biodiversity schemes. On the flip side, setting the target for a financial ODI at the median would result in double-funding of biodiversity improvements for water companies that proposed PCLs above the median target level, to the detriment of customers.
Normalisation of the targets implies unjustified comparability. The use of a target normalised per 100km^2 of area served also confuses the target, as although at face value it makes performance more easily comparable, the ability to deliver improvements is not directly linked to the area of land served.	**Set targets in absolute terms of total biodiversity units delivered.**
Surveying every four years means that biodiversity improvements can only be realised every four years. Current guidance states surveys can only be carried out at four yearly intervals. This will adversely impact reporting of biodiversity improvement in AMP8; it might be that an additional year is required for the key bit of improvement to be seen but if a survey has already been carried out in year 3 or 4 of the AMP, this area would not be eligible for re-survey for a further four years, taking it into AMP9 before any enhancement can be reported on. Some interventions might take 6 years to give a real change, but equally if e.g. weather conditions are favourable, then it could be that a difference is shown in as few as 3 years. Being tied into a 4 year survey would pick up the 4 year change but could result in us having to report a 0 if the full 6 years are needed to show a change. It means that professional judgement can't be used in when it's worth doing a re-survey; if the land is nearly there but not quite, you can't go back a year later to show that change and therefore will miss out on reporting it/counting the change in AMP8. Limiting the surveys to a 4 yearly cycle also removes any incentive to add in new areas of land after 2025/26 as there will be no gain in AMP8. It means that any	**Allow surveys and reporting on findings to be undertaken at least every four years, but more frequently as required.**

Issue	Solution
agreements for work on 3rd party land must be in place (for survey work) in 2025/26 for them to deliver a gain in AMP8 despite changes in some habitats (e.g. hedgerows) requiring less than 4 years to be delivered.	
Ofwat's latest guidance suggests that surveys done prior to 2024/25 will not be used for setting the baseline. In the Delivering Outcomes document, Ofwat that they are setting 2024/25 to a baseline of 0.[271] This implies that any surveys that we have carried out in the years prior to 2024/25 won't count, as we have to use the condition from 2024/25. This is at odds with previous conversations we've had with Ofwat during the development of the biodiversity PC in which they encouraged us to get on and survey land early to get this onto a rolling programme.	**Confirm that surveys done prior to 2024/25 can be used as the baseline for measuring biodiversity improvements against.** As biodiversity improvements are only recorded once the second survey has been completed, this should still align with Ofwat's desire for companies to start at 0 performance against the PC.
There is no guidance on how biodiversity delivered off water company land must be secured, or how long for.	**Provide guidance on how long biodiversity improvements generated off company land should be secured for.**
ODI rates do not reflect current market value of biodiversity improvements. Commercial costs provided to us in Jan 2024 were in a range up to circa ten times the figure used by Ofwat and statutory credits range from £42k – £650k/BU. The figure of £20k came from a Defra BNG market analysis study carried out in February 2021.[272] This figure is considerably out of step with how the market has developed since then. It will be difficult to persuade third party landowners to put their land into generating biodiversity through this ODI when there is no budget to provide a financial incentive until after we've met the (currently arbitrary) target, and even then the potential reward is below current market rates.	**Set different ODI rates based on current market rates for different habitats.** These should be set to differentiate between habitats of different values and not use a lowest or average value as this would distort incentives.
The proposed cap and collar potentially expose water companies to significant additional downside risk. Natural disasters / events e.g. wildfires or new tree diseases (similar to Ash Dieback for example) that are outside of our control could occur. Under the proposed PC, it is not clear whether the significant biodiversity loss these events could precipitate would be counted in our biodiversity PC as this would deteriorate existing biodiversity.	**Set the biodiversity collar on performance to be limited to 0.5% RoRE or zero performance on the biodiversity PC, whichever is least punitive.** Alternatively, a mechanism for excluding the impact of natural events outside of water companies' control from the PC could be implemented.

Source: Northumbrian Water analysis

[271] '**Delivering outcomes for customers and the environment**', Ofwat, July 2024, p.125.
[272] '**Biodiversity Net Gain: Market analysis study Final Report**', eftec, WP, ABP mer for Defra, February 20221, p.23, reference 28.

8.11. UNPLANNED OUTAGE

842. We accept Ofwat's challenging proposed PCL glidepath to 2.14% by 2029/30.

843. However, this ODI has increased significantly and is out of line with the rest of the asset health metrics for PR24. This is not a customer priority, as it does not impact them directly, and an adjustment to this rate would ensure the measure sits better across the asset health and other metrics in the full package.

FIGURE 44: OFWAT PROPOSED ODIS

Measure	Units	ODI rate £m
Unplanned Outage	Per 1%	4.917
Sewer Collapses	Per 1 in 1,000 WW Network	2.552
Mains Repairs	Per 1 in 1,000 W Network	0.2
Discharge Compliance	Per 1%	3.117

Source: Ofwat PR24 Model - PR24-DD-ODI-Rates

844. We have previously demonstrated that all our previous unplanned outages have not affected our customers and are addressed using rebalancing rather than leading to interruptions to supply[273]. Both mains repairs and sewer collapses are more likely to have a clear effect on our services to customers, yet the overall ODI for unplanned outage is far higher than both these measures.

845. Our customers considered asset health measures to be a lower priority overall[274] than direct service measures. As Ofwat has previously acknowledged in its methodology and asset health papers, these are also not a particularly good measure of underlying asset health or appropriate asset management (which customers do value). However, the ODI rates are higher than measures that our customers consider to be a higher priority, such as discharge compliance.

846. Ofwat should change the ODI rate for unplanned outage to the rate Ofwat set at PR19, of £1.72m. This ensures that there continues to be a significant penalty for underperformance but one that sits in line with our customers' priorities. This would help to refocus attention on the higher priorities, such as sewer flooding.

847. The CMA set a deadband at 1.2 times the PCL to offset 'some factors that may be outside companies' control, such as source water quality or turbidity or power failures caused by thunderstorms'[275]. The CMA said that the

[273] 7.220 https://assets.publishing.service.gov.uk/media/60702370e90e076f5589bb8f/Final_Report_---_web_version_-_CMA.pdf
[274] https://www.nwg.co.uk/globalassets/business-plan-2025-30/nes44.pdf
[275] 7.219 Page 662 CMA Final Report, https://assets.publishing.service.gov.uk/media/60702370e90e076f5589bb8f/Final_Report_---_web_version_-_CMA.pdf

inclusion of this deadband reduced asymmetric risk exposure[276]. Ofwat could consider doing so again if there is still residual downside risk across the sector that cannot be offset through "aiming up" in the cost of capital.

8.12. MAINS REPAIRS

848. We do not agree with Ofwat's proposed PCL for AMP8. The 0.43% replacement rate we propose allows a stable level of mains repairs, with the benefits starting in AMP9.

849. As per the case set out in section 5, we set our mains repairs PCL as per our business plan, at 123.4 per 1,000 km of water network for all years in AMP8.

8.13. GREENHOUSE GAS EMISSIONS

850. **Additional guidance to support the CAW V17 is needed and Ofwat's PC definitions needs to reference the specific version of CAW V17 intended to produce the APR table 11A.** The adoption of an industry standard for measuring greenhouse gas emissions is welcome. Ofwat have defined the use of Version 17 of the Carbon Accounting Workbook (CAW 17). Ofwat should note that there are multiple versions of CAW 17 in circulation. In calculating our performance commitment, NWL has used CAW 17 with AR4 global warming potentials.

851. Further, NWL believes additional guidance to support the CAW V17 is needed. Specifically, a comprehensive set of input data should be defined to ensure that all companies are being compared on an equal footing.

852. We therefore propose that before the APR 2025/26 UKWIR agree a final version of CAW 17 for PC use along with a unified data definitions document (Ricardo have already produced a version of CAW V17 which populates the numbers needed for APR table 11A, although at this stage, some manual adjustments are needed to correctly populate 11A).

853. **We have made material changes to our Greenhouse Gas Performance Commitments – these changes benefit customers and the environment with our baseline emissions levels reduced, the % reduction increasing and the total emissions abated increasing when compared to the draft determination.**

854. For water, by the end of the AMP our net reduction against the 2024/25 baseline is now 9.1% (before the adjustment for additional net zero funding), up from the 4.8% proposed in the Draft Determination. Additionally, the proposed total emissions abated over the AMP has also increased to 36,220 tCO2e vs 11,411 tCO2e in the DD.

[276] 7.224 Page 663 CMA Final Report, https://assets.publishing.service.gov.uk/media/60702370e90e076f5589bb8f/Final_Report_---_web_version_-_CMA.pdf

855. For wastewater, by the end of the AMP our net reduction against the 2024/25 baseline is now 19.5% (before the adjustment for additional net zero funding), up from the 19.1% proposed in the Draft Determination. Additionally, the proposed total emissions abated over the AMP has also increased to 110,663 tCO2e vs 109,137tCO2e in the DD.

856. The adjustments to our performance commitment are necessary to improve the reporting of emissions associated with our use of chemicals and correct the emissions factors to align with the PC definition. We have updated our proposed baseline and performance commitments using this revised data – see Figure 45 and Figure 46.

857. To set our PCs in our 2025-30 business plan we had used CAW 17 with the 2021 emissions factors enabled. We have now rectified this – using 2022 emissions factors in line with the PC definition.

858. With respect to chemicals, we have wholly revised our approach. We identified three areas of improvement:

- the mass of chemicals used (at their respective concentrations) has been more accurately measured;
- the quantity of each chemical has now been normalised to consider the concentration of the relevant chemical (when delivered in solution), and
- the use of suitable and relevant chemical emissions factors.

859. We have reassessed the greenhouse gas emissions relating to our chemical use correcting for these three issues. Our total emissions have fallen as a result – meaning that customers have not paid more due to these data issues.

860. These revised chemical emissions have been subject to a comprehensive 3rd party verification in line with ISO14064-1. Our response to the draft determination includes a full audit report from Achilles verifying the changes that have been made (NES80E).

FIGURE 45: REVISED WATER GREENHOUSE GAS EMISSIONS PERFORMANCE COMMITMENT LEVELS (TCO_2E)

	2022-23	2023-24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30
NWL Original Data (OUT2)	112269.02	112269.02	112269.02	113974.23	112908.78	110520.95	108496.05	106840.00
NWL Original PC				113974.23	112908.78	110520.95	108496.05	106840.00
Ofwat DD PC			112269.02	113974.23	112908.78	110520.95	108496.05	104033.27
Ofwat Net Zero base cost funding adjustment				0.00	0.00	0.00	0.00	-2806.73
OUT2 Revised PC from base (pre adjustment)	97,306.43	102,615.63	102,615.63	97,380.07	96,683.94	95,300.72	94,229.11	93,263.84
Enhancement impact on PC				0.00	0.00	0.00	0.00	0.00
OUT 4 Revised PC (pre-Net Zero adjustment)	97,306.43	102,615.63	102,615.63	97,380.07	96,683.94	95,300.72	94,229.11	93,263.84
Revised Net Zero base cost funding adjustment								-413.23
Revised PC (including revised Net Zero adjustment)	97,306.43	102,615.63	102,615.63	97,380.07	96,683.94	95,300.72	94,229.11	92,850.62

Source: Northumbrian Water analysis

FIGURE 46: REVISED WASTEWATER GREENHOUSE GAS EMISSIONS PERFORMANCE COMMITMENT LEVELS (TCO_2E)

	2022-23	2023-24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30
NWL Original Data (OUT2)	127815.47	127815.47	127815.47	108297.54	107276.04	105973.32	104678.13	103341.48
NWL Original PC				108372.22	107350.72	106048.00	104752.81	103416.16
Ofwat DD PC			127815.47	108297.54	107276.04	105973.32	104678.13	100146.09
Ofwat Net Zero base cost funding adjustment				-74.68	-74.68	-74.68	-74.68	-3270.07
OUT2 Revised PC from base (pre adjustment)	122,554.94	120,685.79	120,685.79	99,719.91	99,271.79	98,622.55	97,999.18	97,152.08
Enhancement impact on PC				0.00	0.00	0.00	0.00	0.00
OUT 5 Revised PC (pre-Net Zero adjustment)	122,554.94	120,685.79	120,685.79	99,719.91	99,271.79	98,622.55	97,999.18	97,152.08
Revised Net Zero base cost funding adjustment				-74.68	-74.68	-74.68	-74.68	-89.76
Revised PC (including revised Net Zero adjustment)	122,554.94	120,685.79	120,685.79	99,645.23	99,197.11	98,547.87	97,924.50	97,062.31

Source: Northumbrian Water analysis

861. With respect to chemicals, there are two potential areas where an inconsistent approach could be applied across companies or over time that could be rectified with additional guidance.

862. Firstly, there could be some inconsistency of approach in the chemicals emissions factors used. In March 2024 a Water UK task and finish group identified an up to date set of emissions factors and standard concentrations for the majority of chemicals used within the sector. These factors are different from the default factors contained within the CAW.

863. It is likely that the Water UK list of emissions factors better represents true emissions, but the use of these factors is not allowed within the draft definitions of the PCs. We recommend that Ofwat clarifies which factors should be used and that the same factors should be applied to the baseline year and the following reporting years.

864. For the PC set out in Figure 45 and Figure 46 we have used the CAW V17 default emissions factors list but have assumed that the standard concentrations of chemicals as set out by the Water UK task and finish group are relevant to the CAW default list.

865. However, we consider it would be in customers' best interests to use Water UK's most up to date emissions factors as these will give a more scientifically correct view of actual emissions. Customers will therefore be paying/compensated for a more accurate view of companies' emissions if these revised figures are used.

866. To support Ofwat's decision regarding the chemical emissions factors, we have calculated and verified our chemical derived emissions using both factor sets and provide our performance commitment levels on both basis in Figure 47.

FIGURE 47: COMPARISON OF PCS BASED ON CHEMICAL EMISSIONS FACTORS USED

		2024/25	2025/26	2026/27	2027/28	2028/29	2029/30
Water	PC (pre Ofwat challenge) with Default CAW emissions factors	102,615.63	97,380.07	96,683.94	95,300.72	94,229.11	93,263.84
	PC (pre Ofwat challenge) with Water UK emissions factors	96,368.99	91,802.20	91,125.42	89,792.65	88,753.14	87,801.31
Wastewater	PC (pre Ofwat challenge) with Default CAW emissions factors	120685.79	99719.91	99271.79	98622.55	97999.18	97152.08
	PC (pre Ofwat challenge) with Water UK emissions factors	119772.98	98511.15	98058.48	97404.86	96777.04	95925.88

Source: Northumbrian Water analysis

867. Secondly, the PC definition requires that the calculation of the emissions associated with chemicals should include all chemicals on the default list and any other chemical that accounts for 10% or more of the company's greenhouse gas emissions linked to its use of chemicals. Whilst it is useful to have thresholds to exclude emissions either due to data infidelity or from bespoke chemicals where no emission factor is available, the definition suggested is not practical – without calculating 100% of chemical emissions it is not possible to say whether any individual chemical meets the 10% threshold.

868. In calculating our chemical emissions, we consider all expenditure on chemicals and related products, and only exclude supplies which are not relevant or where there is insufficient information to derive the associated emissions. In 2022/23 our reported chemical use covered 96.85% of our total spend on chemicals and associated products, and 97.63% of chemicals by mass. Whilst this means our chemical emissions inventory is reasonably complete, it is possible to reduce reported emissions by increasing the excluded chemicals – thereby improving performance against the PC without reducing real world emissions.

869. To mitigate this issue, we have normalised emissions from chemicals based on spend allowing us to report an estimate of 100% of our emissions associated with chemicals use. We will commit to using this methodology for subsequent reporting in our APR from 2025/26, and also to continue to target the calculation of emissions based on similar % of spend and tonnage being quantified.

870. **We do not consider RGGOs need to be retained to ensure genuine greenhouse gas emissions reductions.**

871. We recognise that Ofwat has required the companies retain REGOs and RGGOs for green electricity and green gas in order that any risk of double counting is removed – ensuring that green energy exports truly represent a greenhouse gas emission benefit.

872. We, however, have concerns that the CAW methodology (particularly the emissions factors used in the CAW) render this expensive retention of certificates unnecessary for biomethane.

873. The emissions factors used in the CAW for green energy are the UK Government standard factors. The methodologies provided with these factors are somewhat limited and complex. Our reading of this limited information is as follows.

874. The electricity emissions factor (applied inversely in the CAW to any renewable exports) is calculated based on information gained from the power generation industry on its sources of energy. As such, if a company sells its Renewable Energy Guarantees of Origin certificates (REGOs) there is a risk that these REGOs are considered in the calculation of the grid emissions factor – as such the requirement to retain REGOs where an emission reduction is claimed appears to be valid.

875. For natural gas, supplied through the grid, the emissions factor is based on the stoichiometry of the combustion of methane in air in the average UK combustion equipment and does not take account of any non-fossil supplies of gas (consideration is given to sources of fossil gas but there appears to be no provision for biogas/biomethane). As such, any export of biomethane into the grid results in an emissions reduction by displacing fossil gas. Then for gas a generator must retain Renewable Gas Guarantees of Origin certificates (RGGOs) in order to receive a reduction/inset on its net Market-Based emissions inventory. However, because the calculation is based on stoichiometry, even where RGGOs are sold the reduction still applies to location-based emissions. As the emissions from grid-supplied natural gas combustion are a Scope 1 emission, any buyer of the Certificates would

still be obliged to report their emissions using the natural gas factor in their main location-based inventory (avoiding double counting).

876. As noted above, the value of these certificates is significant. Even at current rates, if sold, the value of our certificates would be £10m - £20m across 2025-30 – this would contribute to our leading bioresources efficiency, benefiting our customers and providing an efficient benchmark for Ofwat to challenge the sector. While we are the leader on biomethane, it is likely that the lost value to the industry would exceed £50m across the 2025-30 period on the same basis.

877. We therefore consider that companies should not be required to retain RGGOs for biogas that is generated and injected to the grid or otherwise sold. RGGOs do not need to be retained to ensure greenhouse gas emissions benefits are delivered. And by allowing companies to sell RGGOs customers will benefit from the increased efficiency of bioresources operations in the sector.

878. **We do not accept the adjustments made to our PCLs to account for additional base funding for fleet decarbonisation infrastructure.** We propose that Ofwat reduces adjustments made to our PCLs to 413tCO2e and 15tCO2e for water and wastewater respectively.

879. As set out in NES80C we have completed comprehensive modelling of our fleet and the fleet transition to electric vehicles. The £4.496m of additional base funding covers 96% of that required to deliver chargers suitable for electrifying the 283 light commercial vehicles that we have modelled as being practical to operate as an electric fleet with current technology. For these vehicles, the real modelled CO2e benefit is 428tCO2e/year.

880. Additionally, we have already included a further 5,656tCO2e reduction across the AMP in our PC to account for the EV transition, so with this addition 428tCO2e our proposed total emissions reductions across the AMP exceed the 6,077tCO2e challenge that Ofwat had applied, yet the overall cost of the EV transition has not been accounted for in base expenditure.

881. We note that we have made no adjustment for the impact of enhancement expenditure on our operational greenhouse gas emissions PCLs.

882. **We accept the proposed ODI rate of £188/tCO2e for both the water and wastewater ODIs** as it broadly aligns with the rate we proposed in our business plan.

883. We expect the impact of allowed enhancement expenditure on performance to be added to our performance commitment level.

8.14. OFWAT'S PROPOSAL TO COLLECT APR PERFORMANCE DATA ON 15 JUNE

884. We do not agree with Ofwat's proposal to move the reporting of annual performance data from 15 July to 15 June.

885. We would be unable to meet the deadline of 15 June for most measures because our data is subject to internal audit and investigation process after the close of the period and requires rigorous assurance to make sure this is robust. An early submission would just mean that the data would need to be updated after this assurance is complete, so Ofwat's early work would be out of date.

886. We are concerned that Ofwat would use these early submissions and assume that their expectations for data to be "high quality and subject to a rigorous assurance process" would be met even with the early submission date. We would be disappointed if Ofwat were to require data early, and then apply financial penalties[277] associated with this. It is difficult to understand what the benefit of receiving early, unassured data would be.

887. We also note that performance against a number of measures is only confirmed in the DWI Chief Inspector's report published in July of each year, and it would not be possible to report these early.

[277] 6.5 Financial adjustment to payments page 40, https://www.ofwat.gov.uk/wp-content/uploads/2024/07/PR24-draft-determinations-Delivering-outcomes-for-customers-and-the-environment.pdf

9. OTHER ISSUES IN THE DRAFT DETERMINATION

9.1. DEFINITION OF RETAIL ACTIVITIES

888. In 'Notification of the PR24 draft determination of price controls for Northumbrian Water Limited'[278], Ofwat does not define the scope of retail activities. Instead, it only refers to the changes in retail activities. This document needs to be updated for final determinations to specify what is included in the new scope of the retail price controls.

9.2. THIRD PARTY SERVICES RECONCILIATION MECHANISM

889. There is considerable uncertainty over the revenues and costs we anticipate for the Teesside industrial water (non potable) service, with some very large new customers potentially arriving over 2025-30. We therefore strongly support the use of the proposed third party cost reconciliation mechanism[279] that would align the costs to the automatic in period revenue reconciliation that is already in place (non potable water revenue is within the revenue control).

9.3. PCDS AND DELAYED DELIVERY CASHFLOW MECHANISM

890. We have explained our view on several specific PCDs throughout this response (see sections 7.8.2 on storm overflows, 7.14 on phosphorus, 7.5 on lead replacement, and 7.4.2 on metering), including proposing changes.

891. It is not sensible to rule out changes within the five-year period, as there are likely to be changes in programmes such as WINEP. Ofwat says that companies "should manage delivery risks around unexpected events over the five-year control period. This includes any movement in regulatory dates for WINEP/NEP schemes.[280]" In general, regulatory dates are moved for WINEP schemes because it is the interests of customers to do so – that is, either the investment is not needed by the original date, or there are specific benefits that can be gained in delaying. In those cases, this is not about "managing delivery risks", but instead simply introduces additional regulatory barriers to seeking those benefits. Ofwat should accept changes where there are more benefits in doing so, particularly in WINEP where the EA can support this decision, as this is likely to be in the interests of customers.

892. Ofwat says that companies can apply for a non-delivery PCD to be "held" for schemes that end up running late and are delivered by "a few months" into AMP9. There is a risk for any schemes that slip into AMP9 by more than a few months – where companies may have spent most (or all) of the allowed funding, but then could be exposed to returning all of the funding via the non-delivery PCD. This would incentivise companies to stop any projects forecast to run over by more than "a few months" – this is not sensible, and not in the interests of customers. It

[278] 'Notification of the PR24 draft determination of price controls for Northumbrian Water Limited', July 2024, Ofwat, p.7.
[279] DD Expenditure Allowances, p188
[280] DD Expenditure Allowances, p175

then seems that Ofwat intends for those companies to include this funding again in their plan for the following AMP, as this funding has been subsequently removed through a PCD. Ofwat should clarify how they expect this to work and remove this unintended barrier.

893. Ofwat proposes a “delayed delivery cashflow mechanism”. This could be sensible if this were just accounting for the cost of capital over time, although it is not clear this is necessary outside of extremely unusual circumstances (such as COVID in 2020 and 2021).

894. However, Ofwat has not calculated this correctly if they intended this to be “a customer fairness mechanism” with no penalty. If the RCV run-off were to be recovered as revenue, then the RCV would also need adjusting upwards to account for this at the end of the period – that is, if Ofwat assumes that investment is made one year later, then the remaining RCV would be higher in 2030 than initially thought. Similarly, PAYG adjustments that are clawed back would then need an equal adjustment in future years (such as in the 2030-35 period) when these costs are incurred. The text in the Aligning Risk and Return Appendix seems to indicate that these adjustments would be made at PR29.

895. Rather than making these complicated adjustments, Ofwat should instead make this adjustment only for the time value of these costs not incurred in the year that they were forecast (using WACC). Companies who trigger this mechanism would then be expected to deliver the outputs committed to at PR24, without any uncertainty about funding adjustments for delayed expenditure at PR29 (or any need for a complicated PR29 reconciliation mechanism).

896. We note that the DDCM would need to be calibrated with PCDs, which already include time incentives that would be double counted here. This is particularly challenging because PCDs are based on outputs and DDCM is based on costs.

897. Finally on DDCM, we note that any adjustments would not be applied until 2028/29 (for the first two years) and 2029/30 (for the first three years). This could lead to a large shift in customer bills for companies who do catch up in those final years, with bills reduced for 2029/29 and 2029/30 and then increased by more in the AMP9 period. It would be clear even when Ofwat was making those decisions whether or not companies were likely to catch up with this expenditure. This does not seem to be consistent with evidence from customers about stable bills, and Ofwat should consider making this an end-of-period adjustment instead.

898. Across all of the requirements for delivery, there is a significant amount of reporting and assurance that will require a lot of resources for both water companies and for Ofwat. It would be sensible for Ofwat to consolidate these requirements into a single timeline, and carry out a regulatory impact assessment on these – to understand if there are any efficiencies that could be made, and if they are really likely to be able to assess and make decisions across all of these areas in-period.

9.4. AMP7 DELIVERY ODIS

899. Ofwat has assessed two of our end-of-period performance commitments in PR24-DD-ODI-performance-model-2024-25 – these are PR19NES_BES24 Delivery of water resilience enhanced programme; and PR19NES_BES29 Delivery of Howdon STW enhancement. We respond to these in the sections below.

9.4.1. Delivery of water resilience enhanced programme

900. Ofwat has asked us to make some changes in the way we report against this performance commitment in our DD response, and obtain external assurance over our reporting.

901. We have reported against our performance commitment in our DD response in the same way as Ofwat describes in the ODI performance model (the Override_Additional info sheet).

902. We have also refreshed our external assurance on this (from Jacobs), which we attach as NES80A.

9.4.2. Delivery of Howdon STW enhancement

903. Our original PR19 enhancement request included seven elements – four to support growth, and three to improve resilience. Part of the way through PR19, Ofwat changed its approach so that growth was funded through base rather than enhancement. At FD, Ofwat allowed funding for two of the three resilience elements, explicitly rejecting funding for the third.

904. The associated ODI, as written at PR19, required us to deliver all seven elements or pay a penalty for each month of delay. We wrote to Ofwat in July 2022 requesting this to be corrected to reflect just the two elements funded as enhancements. Ofwat did not reply until the DD, when they said:

> "We do not agree that there is an unambiguous error in this performance commitment with respect to the scope of the upgrade at this treatment works. Whilst the ODI rate for this performance commitment derives from the enhancement related work, the performance commitment explicitly includes the delivery of growth-related resilience investment…… This is because, based on the submissions at that time, the enhancement projects would do nothing to improve resilience unless the underlying work to address the growth element was also being addressed".

905. We think there is still an unambiguous error that Ofwat has missed – the inclusion of the third resilience element that was not funded at PR19. There is no expectation from Ofwat that this work should be done (and so the decision not to fund this) and so this should not be included in the ODI rate.

906. We do not agree that the growth-related investment should be included in this PCD, and we do not expect to deliver the growth elements we set out at PR19. This is because this investment was not required in practice and will likely be required in AMP8 instead.

907. In query OFW-OBQ-NES-083, we explained that we spent much less than we forecast during AMP7 on Howdon WWTW growth. Howdon is our largest STW covering all of Newcastle city, Gateshead and the surrounding area. Due to the impact of COVID the growth in this area slowed, especially due to a drop in occupation of office and commercial premises. There were also drops in trade effluent into the site.

908. In addition to this, we have carried out work to delay the need for growth expenditure at Howdon. We have undertaken five surface water removal projects since 2013 and have delivered a number of flood alleviation schemes which have reduced inflow to Howdon.

909. This work, along with reductions in forecast demand growth, has allowed us to delay the need for growth expenditure - but the site is still projected to exceed the DWF permit consent by 2030. We have begun work in AMP7 to prepare for this, including land purchase, treatment process trials, modelling and initial design work. It is highly likely that we will have new quality and flow permit conditions, but these have not yet been agreed by the EA. They are likely to include a new ammonia consent (the site currently doesn't require an ammonia consent), tightening of BOD, suspended solids, and new validated dose requirements for UV. There will also be a requirement for an increase to FFT, and potentially storm tank size.

910. It is not sensible to penalise our decision to delay this work, as this is clearly the efficient choice – we could have chosen to continue to do this work anyway (and so avoid a late penalty), but it is the right choice for customers to delay investment where it is not needed. We note that we do not benefit from delaying this work.

911. Ofwat should reconsider the inclusion of growth elements in this ODI PCD.

912. In addition to this, we could not understand the rationale for increasing the penalty for late delivery to claw back 1/60th of the enhancement funding per month. This is different to the proposal for our water resilience schemes, which was a more sensible approach based on the time value of money for late delivery. Ofwat should consider using a similar method for the calculation of the Howdon growth ODI PCD.

9.5. UNCERTAINTY MECHANISM FOR PFAS

913. PFAS are likely to be a significant issue in the future, due to their potential presence in drinking water, effluent, and biosolids. We have seen rapid changes in regulatory guidance in the last few years, expanding the scope from 2 to 48 substances.

914. We have four sites at risk, with no investment required for this in AMP8 because all of these are still at "monitor" status. But there is still significant uncertainty – there might be sites where this investment is required in-period; and there might be a change in PFAS standards.

915. We understand that other companies are planning to propose an uncertainty mechanism for PFAS with their DD representations. This is sensible in the context of likely regulatory changes (for a similar reason to Ofwat's planned uncertainty mechanism on bioresources). We think this should be consistent across the whole sector.

916. For us, this would mean tackling uncertainty at four sites (Langham, Langford, Chigwell, and Hanningfield). These are large surface water bodies at risk, with a very large volume of treated water – and so it is likely to be much higher cost than those schemes in other parts of England and Wales that mitigate groundwater risks (as these are smaller sources). We would support a bespoke uncertainty mechanism for reconciling these costs, if this investment is required.

917. This type of bespoke uncertainty mechanism would require reconciliation at PR29 for any costs. As we set out in sections 2 and 7 above, there are considerable forecasting risks in the DD on issues such as power, business rates, and business demand growth which place a lot of risk on companies in AMP8 (with reconciliations at PR29, which could then lead to large bill increases). These would make it very difficult to manage an additional cost risk, which would have a similar effect. Ofwat should address this risk in general before introducing a new bespoke uncertainty mechanism.

918. We provide a report which assesses this uncertainty and options for addressing this with our representations as NES92.

9.6. UNCERTAINTY MECHANISM FOR BIORESOURCES

919. We welcome the inclusion of a notified item for potential increases in bioresources costs relating to sludge as this represents a material risk to the sector if changes to the legislation around application to agricultural land of fertiliser derived from sludge were to materialise. However, to ensure that this risk is properly protected against so that wastewater companies can recover their efficient costs we think some changes need to be made to the draft determination:

- It is not just legislative changes that could affect changes to landbank availability. For example, there could be a re-interpretation of Defra's Farming Rules for Water, new or amended guidance or other material decisions by a regulator or government. Ultimately anything that leads to loss of landbank is the material change in circumstance that this notified item should protect against rather than just a legislative change.
- A more appropriate threshold for triggering the notified item is that it considers turnover of the bioresources price control rather than overall turnover. This is more appropriate given that bioresources is a competitive activity with its own control and this will ensure that the cost companies are able to recover better reflects cost and market pressures.

9.7. WATER QUALITY PCD

920. Ofwat has included the delivery of DWI legal instruments for HAZREV, PFAS, and lead in their water quality PCD. It would be helpful to be clearer about what the acceptance criteria would be for these (for example, DWI confirming that these legal instruments were met). Ofwat should also confirm that there would be an opportunity to review this at PR29, as these are required in 2031/32 and there could be changes before then.

921. There is also some double counting, as delivery of our lead strategy is included here and also in the lead replacement PCD. Ofwat should remove the lead strategy element from the water quality PCD as this is already covered in the lead replacement PCD.

9.8. EXECUTIVE PAY

922. In the DD Ofwat raises some 'minor' concerns about our policy in relation to Executive Pay, specifically Ofwat states:

> Northumbrian Water's policy for performance related executive pay during 2025-30 only partially meets the minimum expectations as set out in our PR24 methodology. The policy did not explain how the remuneration committee will consider overall performance delivered for customers and the environment, in addition to performance against specific metrics.
>
> The policy meets our other expectations and this helps to mitigate the impact on customers and environment given that the policy for 2025-30 should still substantially incentivise stretching delivery for customers and the environment. Nevertheless, the company should ensure that the deficiency highlighted above is addressed ahead of the policy being implemented from 2025 onwards.

923. We made some updates to our remuneration policy last year that we recognize were not clear in the business plan. Our remuneration policy we believe now addresses Ofwat's concerns around overall performance. In our annual report and financial statements for 2023/24 we provided a full and transparent disclosure of both the policy and also the executive remuneration arising from it for the year[281].

924. Our approach now considers performance in the round, for example in the Chairman's statement it states:

> We have also reflected on whether the Group has experienced any significant performance issues not measured by the scorecard and have concluded that it has not.

925. Moreover, the Remuneration Annual Statement and Policies states:

[281] See: https://www.nwg.co.uk/globalassets/corporate/apr/2024/nwl-annual-report-and-financial-statements-2023-24.pdf see 'Remuneration Committee report' pp.97-

The remuneration policy is designed to incentivise performance across all the full range of the Group's strategic themes and not to over-emphasise short-term financial gains.

10. REMAINING UNCERTAINTY IN OUR BUSINESS PLAN

927. On 24 May, we wrote to Ofwat to provide updated costs and deliverables for several areas of uncertainty that we had highlighted in September 2023 and in our October 2023 business plan. These were uncertain because the regulatory requirements (on WINEP monitoring, nutrient neutrality, septic tanks, and WRMP) had not yet been finalised, or we expected revisions to guidance which would mean significant changes to these programmes and the related costs and deliverables. We had said that we would provide Ofwat a full updated set of costs and deliverables for these areas once these became clearer. Our 24 May letter provided most of these updates.

928. Some of these areas of uncertainty mean increases in customer bills compared to our business plan (nutrient neutrality and WRMP), and some mean reductions in customer bills (WINEP monitoring and septic tanks).

10.1. NUTRIENT NEUTRALITY

929. In our enhancement case for **WINEP protected areas and bathing waters** (NES28), we set out how we will deliver on our commitments to maintain bathing water quality, maintain and improve our natural habitats, and restore our marine conversation zones. These plans were aligned to WINEP statutory guidelines.

930. This included the need to reduce nitrogen at Seal Sands (under WINEP driver HD_IMP) and achieve nutrient neutrality requirements in the Teesmouth & Cleveland Coast SPA (under WINEP drive HD_IMP_NN). In 2022, Natural England issued advice that 31 habitat sites are in unfavourable condition due to excess nutrient pollution. Because of this, the advice says that development plans or projects in these areas can only go ahead if the additional wastewater produced by the development will not add to nutrient pollution – that is, they must be "nutrient neutral".

931. Following this advice from Natural England, the EA issued guidance in December 2022 to say that water companies should upgrade all STWs in these areas that serve a population equivalent (PE) of more than 2,000 people. The objective of this was to remove nitrogen from final effluent to meet the "technically achievable limit" (TAL), which is currently 10mg/l of total nitrogen. In our region, this only applies for nitrogen limits for Teesmouth and Cleveland Coast SPA and Lindesfarne SPA together with the river catchments that drain to these areas. As all STWs discharging to Lindisfarne SPA have less than 2,000 population, only the Teesmouth and Cleveland Coast SPA is subject to TAL requirements.

932. Following this guidance, the Levelling Up and Regeneration Act provided a greater level of flexibility than expected in how we could reduce nutrient pollution across the affected catchment, with the aim of "maximising benefits for the environment while minimising costs on water bill payers"[282].

[282] See Appendix A of **NES28**

933. As we described in our business plan (NES28), we have challenged the EA by providing advocacy and evidence to support our Advanced WINEP proposals, and we put forward a flexible approach which would use nature based and catchment solutions to reduce nutrient pollution, at a cost of **£47.7m**. We discussed these proposals with the Water Forum throughout the process, and they asked us to continue to push for this. We made some modifications as agreed with the EA as we developed our business plan further, and so the proposal in our business plan in October 2023 included these.

934. These alternative solutions under Advanced WINEP required agreement from the Secretary of State. Since October 2023, we have worked with the Environment Agency and Natural England to provide further details about our modelling and how we would expect to meet the requirements through nature-based solutions. In Table 20 of NES28, we set out three possible options to address this need, explaining the total costs and benefits for each solution. Our preferred solution was both the least cost and (significantly) best value option.

935. In **June 2024**, Defra confirmed in writing that we will be required to take forward our option for nature-based solutions and a long sea outfall (the second column in Table 20 of NES28) and in August 2024 we received confirmation from Defra that the Government has designated the Solent, Avon and Teesmouth and Cleveland Coast catchments as catchment permitting areas. This is a change in our business plan.

936. As part of our representations, we have included a **supplementary enhancement case** (NES28A) for these changes (NES28a) which explains the cost of the long sea outfall and other changes to our enhancement case. We have not changed the costs or benefits or the original nature-based solutions, which are still included as well as the new long sea outfall, and we assessed the benefits of the long sea outfall option in our original business case. We have updated our business plan tables to include the costs and benefits for this new option.

937. We have carried out additional customer research since June 2024 on this topic, and have considered further customer protection, risk sharing and potential for third party income in future. Our customers had mixed views on this, with some considering that this was acceptable because this was considered necessary by the EA – and some considering that the original plan for nature-based solutions was better. We discuss this further in NES28A.

938. This increases the totex in our business plan by **£245m.**

10.2. WATER RESOURCES MANAGEMENT PLAN (WRMP)

939. In our October 2023 business plan and our subsequent letter to Ofwat of 25 January 2024, we noted that our WRMP was still not final, and we had not yet received the final round of feedback from Defra.

940. Since then, as we explained to Ofwat in our letter of 24 May 2024, we have been required to make some changes.

941. In January 2024, Defra directed us to make our "Habitats Regulations" adaptive pathway (see our WRMP and LTDS for details) our preferred plan. However, we subsequently met with the Environment Agency and agreed that – since the Environment Agency investigations have not yet concluded, moving to the adaptive programme would make our plan more uncertain. So, we agreed not to move immediately to the Habitats Regulations adaptive pathway, but instead to prepare for a likely decision to do so in 2027 (that is, the decision point for switching to this adaptive pathway).

942. The extent of likely sustainability reductions needed to meet the requirements of the Habitats Regulations will not be known until December 2024, once the Environment Agency has finished its investigations. So, we have worked with the Environment Agency to agree some likely worst case sustainability reduction values in our revised draft WRMP24. We have included these in our supply forecast for the Habitats Regulations adaptive pathway. These reductions will cause larger supply deficits, particularly in our Suffolk Northern Central water resource zone.

943. These abstraction reductions are larger than we expected in our draft WRMP, because there are now additional constraints. The Environment Agency has reassessed its previous permitting decisions in the Norfolk Broads, following the outcome of a Judicial Review, and wrote to us in February 2024 to confirm that we should allow *further* Habitats Reductions sustainability reductions in relation to abstraction from boreholes in the River Waveney catchment.

10.2.1. What does this mean for our 2025-30 business plan?

944. This means that there are further supply schemes required to meet the Habitats Regulations adaptive pathway, as well as this now being a likely outcome (even if the details are still not certain). In order to meet this, we need to include funding in AMP8 for detailed investigations and design for three new schemes so that construction could start from January 2028. These schemes are: **Caister reuse**; the new **Trinity Broads winter storage reservoir**; and a connection to Anglian Water's **Bacton desalination plant**. These schemes are as follows:

- **Caister reuse**. Before these additional requirements, our WRMP already included the Caister Water Reuse scheme as part of the Habitats Regulations adaptive pathway (to be delivered by 2032/33, and so construction starting by 2028). Investigation and design would need to start now to meet this deadline under this adaptive pathway, which is now likely. We estimate that the whole project would cost £66.07m, in 2021/22 prices (we costed this under the WRMP alternative pathway).

- **Trinity Broads winter storage reservoir**. We currently have an abstraction intake on Ormesby Broad, part of the Trinity Broads system. The Environment Agency has warned that Habitats Regulations sustainability reductions could now result in the partial or full loss of the Ormesby abstraction licence. So, we have identified a new option – a winter storage reservoir. This reservoir would be filled during the winter and could potentially remove all summer abstraction from the Trinity Broads system. We have discussed this option with

the Environment Agency and Natural England who are both supportive of us investigating this as a solution to make up for the loss of direct abstraction from Ormesby Broad. This would have a storage capacity of 7,500Ml – the same as the North Suffolk reservoir already being investigated under the Accelerated Delivery programme. We estimate that the whole project would cost £214.8m, in 2021/22 prices, based on the costs of the North Suffolk winter storage reservoir.

- **Bacton Desalination Plant**. Defra has asked Anglian Water to further consider the implications of the Habitats Regulations investigations in Norfolk. As a result, we understand that Anglian Water has asked for further funding in AMP8 to develop the Bacton desalination plant on the north east coast of Norfolk. We met with Anglian Water to discuss this option and have agreed that it could be sized to address some of the Suffolk supply deficits driven by our Habitats Regulations sustainability reductions. So, we have identified a new option to build a pipeline from Norwich to our Barsham WTW, where this could then connect into our new Suffolk Strategic Mains system (this system is already in our business plan). This was previously discounted as a feasible option for AMP8, because Anglian Water had planned to only need this in the 2040s. We estimate that the whole pipeline would cost £40.5m, in 2021/22 prices, based on our costs for initial options appraisal in WRMP.

945. These three schemes will need to go through detailed investigation and design now, before switching to the Habitats Regulations adaptive pathway from 2027.

946. We propose that the costs for detailed investigation and design should be included in PR24 determinations, based on the 6% of capex recommended for RAPID schemes – this would be a total of **£21.0m** in addition to our business plan (as calculated from the costs of each scheme, uplifted to 2022/23 prices). We will begin the work on Caister Reuse investigations and design in 2024-25, but we have included this in our business plan in 2025-26 and 2026-27. We expect that these will be treated as **large gated schemes** alongside the Lowestoft and North Suffolk Reservoir schemes at FD (with the same timescales and approach as for those schemes, described in section 7.3.4).

10.2.2. What does this mean for our adaptive pathway decision point?

947. This means that our existing decision point in 2027 will now need be extended to make decisions about two adaptive pathways:

- **North Suffolk reservoir**. We will decide in 2027 whether we should construct the North Suffolk reservoir instead of Lowestoft reuse. We have already proposed an uncertainty mechanism to tackle this decision point, with the funding for Lowestoft reuse included fully within our business plan for AMP8 and only detailed investigation and design funding for the North Suffolk reservoir under the Accelerated Delivery determinations (the uncertainty mechanism would adjust this totex if a different pathway was required).
- **Habitats Regulations**. We will decide in 2027 whether we should construct Caister Reuse, Trinity Broads reservoir, or Bacton desalination plant – or a combination of the schemes. This will depend on the outcome of both Environment Agency investigations during 2024, and our detailed investigation and design work. It is possible that further work or adjustments to existing planned projects (such as larger diameter mains) might be required, depending on the outcome of these investigations.

948. This would also substantially increase the potential expenditure under the Habitats Regulations adaptive pathway from 2028, and so would increase the value of the uncertainty mechanism to tackle any investment needed after taking this decision in 2027. As this information is new and investigations have not started yet, we have not yet planned a programme for these investments to determine precisely how this would be profiled between the last two years of AMP8 and then into AMP9 – but we anticipate that this could mean up to around **£120m additional totex** required between 2028 and 2030. We note that there are also still some potential risks to the North Suffolk reservoir, with a possible increase in storage capacity required (from 7,500Ml to 20,000Ml) if there is a much higher “hands off flow” condition set by the Environment Agency.

949. This continued uncertainty is not in our control, and regulatory uncertainty means that the five-year price control process will not be enough to allow us to respond to switch to an adaptive pathway (without such an uncertainty mechanism which allows this in 2027).

950. We would expect these schemes to follow the same timescales for making decisions as those we described in section 7.3.4 above.

951. This is in addition to the investments required for water supplies that we included in our business plan, and the further investment in the Kielder Strategic Resource option following the subsequent decision by RAPID[283] (see section 7.3.5).

[283] Also see our letter and business plan tables of January 25 2024 and our previous query responses.

10.2.3. Impact for customers

952. These new investments do not have much impact on overall totex for PR24 determinations (with a net impact of an increase of around £6m on water totex compared to our October business plan – taking into account the changes outlined in our 25 January letter). However, these could have a substantial impact on totex and bills in the last two years of AMP8 and then into AMP9 and beyond, depending on the decisions in 2027. So, we are also reviewing our long-term strategy and the likely impact on bills in Essex and Suffolk.

953. We have not changed the costs or benefits of the original water supply options in NES14, which remain in our WRMP, except to correct values for one interconnector (see 6.7.2 in our table commentary). We have updated our business plan tables to include the costs and benefits for these new schemes.

954. In our customer research for the DD (NES82), we asked customers to discuss these additional investments. Customers in Essex & Suffolk showed a high level of acceptance when asked about the change to introduce additional water resource projects, with a mean score of 7.52 (out of ten)[284].

955. This increases the totex in our business plan by **£21.0m**.

10.3. WINEP MONITORING

956. In our business plan, we explained that there were two areas of WINEP where we had some uncertainty about guidance on monitoring. In particular, we said that[285]:

> "Recent guidance received from the Environment Agency and UK Government in relation to the Continuous Water Quality monitoring arrangements, whilst very helpful, has arrived too late for it to be reflected in our final plans and passed through our assurance processes.
>
> "For some of the monitoring requirements (UMON-6) we are still awaiting final guidance from the EA, which is not expected to arrive before business plans need to be submitted on the 2nd of October."

957. This meant that our October 2023 business plan included our programme of investment developed to meet the guidance from before August 2023, as there would not have been time to develop and test a plan based on the new guidance by 2 October. We provided shadow tables[286] based on the likely impact of the August 2023 guidance on our plan.

[284] NES82, p50
[285] Letter to Ofwat, 19 September 2023, included in our business plan as NES66
[286] NES_BPT04, published on 2 October 2023

10.3.1. Continuous water quality monitoring

958. We have now redeveloped our programme and costs for continuous water quality monitoring based on the August 2023 guidance and subsequent discussions with the Environment Agency – who have clarified how they expect companies to meet this guidance.

959. This revised plan will reduce our AMP8 totex from £124.79m in our October business plan to **£55.45m** now (and compared to our estimated £35.1m in our alternative tables alongside the business plan[287], and £58.14m in our 25 January alternative business plan tables, due to refined costs and additional requirements from guidance).

960. This compares to an estimated £52.4m for the same programme in the Ofwat DD model.

961. This reduction is primarily due to a reduction of the number of monitors required to be installed in AMP8 from 1,187 in October to 390 now.

10.3.2. Changes reflecting the new guidance

962. Our business plan submission was based on deploying monitors in Estuarine and Inland River locations in AMP8, with Coastal locations in AMP9. The new guidance set an assessment and prioritisation framework which meant only 25% of monitors are required in AMP8, with estuarine monitors not required at all.

963. Our business plan was based on guidance that monitors should only be clustered if there were multiple monitors within 50m of each other (that is, only one monitor is required for the cluster even if the guidance otherwise indicates there should be more). The new guidance confirmed that much more “clustering” would be allowed – this was very welcome, as we had written to Defra to suggest this as one possible way to deliver the outcomes of the programme more efficiently and at a lower cost to customers. Our early interpretation of this new guidance was that monitors should be clustered within a 1km allowance of water course length per cluster (and so many monitors would not be needed). Following clarification on this guidance, our revised plan uses the approach of clustering within a 0.5km length, with an allowance of 500m for the location of the downstream monitor. This reduces the number of inland water monitors required across the whole programme from 1,790 to 1,284 across both PR24 and PR29 periods.

964. Finally, we repeated the modelling using new software (as required in the new guidance, using OS – MasterMap, to provide consistency across the sector). Based on this new analysis, the guidance requires us to install a minimum of 334 monitors within the AMP8 period, and half of these need to be high priority sites. In practice, we have 390 inland river high priority sites, and so we have chosen to select all of these for investment in AMP8 (so meeting and exceeding both requirements from the guidance). This is because this provides a complete dataset

[287] NES_BPT04, published on 2 October 2023

for high priority sites (that is, the sites where most benefit should be derived from monitors). This also maintains the AMP9 investment at a similar level, rather than delaying investment from AMP8.

965. We note that the guidance reduced the total quantity of monitors delivered across AMP8 and AMP9 from 2,138 to 1,334; this means that the total number of monitors required in AMP9 has reduced slightly from 951 in our October business plan to 944 now across all water bodies. At the time of our business plan submission, the updated guidance seemed to require monitors to be delayed from AMP8 to AMP9 – but this is not the case, with many no longer being required at all. This does not include an estimated 172 estuarine monitors which are no longer included in the AMP8 guidance at all (but could also be required in WINEP for AMP9 under any future guidance).

10.3.3. Changes to costs following assurance and further information from the EA

966. In revising our modelling, we also carried out some further cost assurance activities. The EA's National Water Quality Instrumentation Service (NWQIS) also provided more data about the costing information based on their operating model – allowing a deeper understanding into the potential costs associated with river water quality monitoring.

967. This further cost assurance revealed an error with the way estimating uncertainty had been calculated in the business plan. Instead of applying an estimating uncertainty uplift to the sum of (scope + project overheads + contractor overheads), it has been incorrectly applied to the sum of (project overheads + contractor overheads + risk). This error would have meant an increase of **£12.8m** in our estimated costs in the October business plan. This is somewhat offset in our new cost estimates, where we have also reduced the project and contractor overheads as we consider these could be done more efficiently – applying this to our October business plan would have reduced costs by **£10.2m**.

968. The new guidance and costing information available has shown that our estimates for installation at "difficult sites" were too low. These costs should be increased by £33,301 per installation. The guidance also meant increased data platform and laboratory costs. In total, these changes would have meant an increase in **£13.4m** for our October business plan costs.

969. In addition to this, we found that **£6.9m** had incorrectly been allocated to 2030/31 and so was not correctly included in our enhancement case.

970. These changes explain our new capex, which shows a higher unit rate than our October business plan submission (despite the lower value overall).

971. We are still learning about the costs for land in practice, as we are currently assessing this for our pledge to deliver water quality monitoring at 22 priority sites (27 monitors) by 2025 (under our **Vision for our Coasts and**

Rivers). We have identified sites for these, and we expect the land costs to vary greatly – from simpler rural locations, to monitor kiosks in back gardens.

972. In addition to this change in expenditure for monitors, the new WINEP guidance means that we have more detailed scopes for our complex investigations (this expenditure is recorded in line CWW3.109 of the business plan tables). This expenditure on complex investigations will be **£1.556m** higher in order to meet this guidance. This is because for the October plan our modelling indicated that we did not need any Inland Complex investigations and the specific investigations had not been established.

10.3.4. Monitoring emergency overflows

973. We have continued working with the national EA PR24 team to determine the sites for inclusion under the U_MON6 emergency overflows driver in our AMP8 WINEP. This will be broadly equivalent to 25% of the sites in our plan in October, with the remainder (75%) to be phased in subsequent AMPs – but this depends on the prioritisation of sites, which must still be agreed with the EA.

974. We have proposed a set of sites for AMP8 which, in total, would mean **£19.5m** (totex). As we explain in section 7.10.2, this is about the same as 25% of our original plan - but the precise amount depends on the EA agreeing with our proposal.

975. This is not yet agreed by the EA, but we think this is likely to be broadly the outcome. The EA had previously indicated that they would like to resolve this before the Draft Determinations, but this did not happen. However, we do not think this will be significantly different to 25% of our full programme costs.

10.4. SEPTIC TANKS

976. In our October business plan tables, we had not yet reflected the updated guidance on septic tanks from the Environment Agency[288] and made an estimate of the potential impact of the guidance. We completed these updates and the associated assurance and reflected this in our 25 January business plan tables. This resulted in a £17m reduction in the scale of the septic tanks programme following changes to the requirements and guidance issued by the Environment Agency[289].

977. We published our enhancement case for septic tanks (NES31) with our business plan in October 2023[290]. This showed the list of 71 sites for investment in septic tanks.[291] Our revised list of 32 sites is as follows:

[288] We explained this in our letter to Ofwat on 19 September 2023, NES66
[289] We explained this in our January 2024 commentary published with the business plan tables.
[290] NES31
[291] Table 18 of NES31

FIGURE 48: LIST OF SITES FOR SEPTIC TANKS (REPLACES TABLE 18 OF NES31)

Site name	Location
Albany Rd./Saltmeadows Rd.	North East
Attwood Terrace St (Attwood Place)	North East
Beacon Hill No.1 St	North East
Beacon Hill No.2 St	North East
Beacon Hill No.3 St	North East
Bothal Cottage	North East
Bridge Terrace St (Berwick)	North East
Brotherlee St	North East
E.W.S. Offices	North East
East Castle North St	North East
Foxton Hall St	North East
Hagg Bank	North East
Hepple	North East
Hetton Lyons St	North East
Horncliffe 1, 2 & 3 (North)	North East
Horncliffe South	North East
Langham High Lift PS	Essex & Suffolk
Langham Low Lift PS	Essex & Suffolk
Lartington No.1 St	North East
Lartington No.2 St (Cotherstone St)	North East
Low Worsall St	North East
Marske Machine Company	North East
Newminster Terrace St (Morpeth)	North East
Old Park Terrace St (Byers Green)	North East
Railtrack Signalling Box	North East
Rothbury St Caravan Park	North East
Ryton Willows St	North East
Tosson Tank	North East
Tursdale St (Old Mill/Metal Bridge)	North East
Walpole	Essex & Suffolk
Warden Village	North East
Warkworth Helsay Farm St	North East

Source: AMP8 WINEP spreadsheet, can be found on Defra's website

978. We reflected this change in our 25 January business plan tables and make no further changes in our DD representations – this is already in Ofwat's Draft Determination. We note that the list in Figure 48 reflects the most recently published WINEP, which includes some "swapped" sites since our 25 January business plan tables (but no changes in total programme costs).

979. We have accelerated the Tursdale Street site (see Figure 48) through transition expenditure, and this is now nearly complete.

11. OUR SUBMISSION IN RESPONSE TO DD

980. As part of these representations, we have provided a full set of updated business plan tables. This updates our January 2024 tables (as Ofwat has used for draft determinations) as follows:

- We have updated our tables in response to **Ofwat queries**, including additional queries from Ofwat since January.
- We have updated our tables for **2023-24 actuals**. When we published our business plan in October 2023, the 2023-24 values were still forecasts – we published our 2023-24 Annual Performance Report on 10 July 2024, and so we have now updated our business plan tables with this new information.
- We have updated our business plan in response to regulatory decisions about **areas of uncertainty**. These requirements mean that we need to change our business plan in these areas.
- We have updated our business plan in **response to the draft determinations** (see sections 7, 8 and 9).

981. We explain these changes in more detail in our separate **tables commentary,** and we have provided an updated changes log within the business plan tables template. We also provide our revised financial model as part of these representations, reflecting all changes since our October 2023 business plan.

11.1. ADDITIONAL STORM OVERFLOWS

982. Our AMP7 investigations showed that there were eleven more storm overflows which were now cost beneficial to tackle, and the EA asked us to include these in WINEP for 2025-30. We have added these to WINEP and provide the additional costs in our revised business tables. This will cost an additional **£21m** in 2025-30.

983. In addition to this, we created a prioritised list for accelerating our storm overflows programme. Our customers and the Water Forum asked us to consider accelerating the storm overflows programme if this could be done without increasing beyond the acceptable level in our business plan. As some investments are no longer needed, such as WINEP monitoring, we developed this list so that we could accelerate our storm overflows programme if possible.

984. We created this list using three groups:

- Firstly, we considered those storm overflows where most of the drainage community would be improved in 2025-30 already – and so the impact would be reduced from the whole drainage community together (and so delivering a benefit to the local water body as a whole). These storm overflows were scheduled for AMP9.
- Secondly, we considered those storm overflows where we were carrying out other work to reduce our impact on the environment – such as transfers or catchment schemes. Improving storm overflows at the same time could remove our impact on local water bodies entirely, helping to support good environmental status. Most of these would otherwise not be improved until AMP10 and beyond.

- And finally, we considered those storm overflows where at least one storm overflow in the drainage community was scheduled to be improved in 2025-30 already – and where the whole programme for that drainage community was due to conclude by 2035. These storm overflows were scheduled for AMP9.

985. We include our full list of 69 additional storm overflows in our ADD20 table, including the details Ofwat needs for cost models. These are largely grey storage, with no large separation schemes such as Marske or Berwick, and are efficient under Ofwat's cost models.

986. We asked our customers if they agreed with our plan to increase the number of storm overflows in AMP8 (see NES82). This had high acceptability for customers (a score of 8 out of 10), with customers saying that this was because spills from storm overflows need to be reduced. We discussed several options for increasing the number of overflows we would tackle. Our updated affordability and acceptability testing (NES83) shows that storm overflows and reducing pollution incidents have grown in importance since the business plan development (31% of customers thought storm overflows were the most important part of the business plan in 2024, compared to 22% in 2023).

987. In addition to these storm overflows, we have put forward a more ambitious target for our performance commitment in this area – and if Ofwat accepts this additional investment, we will now target 14.0 average spills per overflow by 2029/30. We have taken on Ofwat's base efficiency challenge to reduce storm overflows from 5% (in the DD) and **taken this further** to an increased level of 7.15% improvement from base expenditure.

988. These additional 69 storm overflows will cost around **£130m**, in addition to our business plan and the additional 11 now in WINEP. This will increase the number of storm overflows improved by 2030 from 159 (15.6% of all overflows that need to be improved) to 239 (23.4% of all overflows that need to be improved).

11.1.1. Increasing the number of storm overflow investigations

989. Ofwat's proposal to issue an enforcement order and impose a financial penalty on Northumbrian Water indicates that for all storm overflow sites that spill 20 times or more, it expects water companies to progress an investigation to confirm whether it satisfies the BTKNEEC test – and in the absence of this, these sites would be in breach of Regulation 4(2) UWWTR[292].

990. This is not the approach currently taken in WINEP, which sets different levels of investigations on the water quality assessment for harm, using the industry standards set through SODRP. In our business plan, we included 381 dilution assessments and 300 "level 1" investigations which were included in WINEP but would likely not be enough to satisfy the requirement for a full BTKNEEC test.

[292] Notice of Ofwat's proposal to issue an enforcement order and impose a financial penalty on Northumbrian Water, 4.99

991. However, there are different criteria for a BTKNEEC assessment, SOAF, INV4 under WINEP, and Ofwat's expectations set through the enforcement case. We estimate that this could cost as much as **£22.6m** more than the current plan. There is still some confusion over exactly what is required, and we note that for example SOAF was originally intended to satisfy the requirements of Regulation 4(2) UWWTR too. We also expect the EA to consult on a revision to the 1997 DETR UWWTR guidance after DD that will focus on regulatory changes for storm overflows, such as a revised version of the Storm Overflow Assessment Framework (SOAF), guidance on the application of BTKNEEC tests, and Spill Frequency Trigger Permitting (SFTP). This may lead to additional costs and changes to our plans.

992. We have not included this in the business plan tables we have submitted alongside this response, as Ofwat should consider this for the whole sector together. This includes clarifying the requirements about what Ofwat means by full BTKNEEC, and how these overlap with the current SOAF and INV4 investigations in WINEP as well as potential future requirements.

11.1.2. Storm overflows uncertainty mechanism

993. Ofwat proposes an uncertainty mechanism for storm overflows[293], recognising that there are three reasons why there is uncertainty over the number of storm overflow schemes that may be required in the 2025-30 period – that is:

- Some UWWTR investigations may lead to some storm overflow schemes no longer being required; and some may lead to new storm overflow schemes being required. If investigations lead to storm overflow scheme requirements related to the UWWTR, then the EA now expects these to be completed as soon as possible, and no later than three years after the completion of the investigation.
- There may be a need for new storm overflow schemes in the 2025-30 period due to future designations of Bathing Waters.
- Defra will review the SODRP in 2027, to test if we can go further. We do not yet know the impact of this review and whether it could lead to a requirement for further investment on storm overflows in the 2025-30 period.

994. We strongly support such a mechanism. In the PR19 WINEP, we proposed contingent funding for improvements at storm overflows if investigations were to find that these were needed – and this was not permitted due to concerns about how this contingent funding might be used or recovered. This led to improvements being delayed to the PR24 WINEP, in line with the EA guidance. An uncertainty mechanism will allow these improvements to be made immediately in AMP8, without the need for contingent funding.

[293] DD Expenditure Allowances appendix, 4.7.5

995. This should be extended to **improvements for new bathing waters**, too. At our newly designated bathing water at Littlehaven, the EA has included both an investigation and improvement in AMP8. We do not know what the investigation will show, as this is a new bathing water with no previous information, and so there is no information on which to base the options or costs for possible improvements – this could relate to storm overflows, or to other interventions (including where this is not related to our assets and is instead related to third parties).

996. We have not included any costs for improvements at Littlehaven in our business plan tables in response to DD, and instead **we ask Ofwat to include this** potential bathing water improvement as part of the storm overflows uncertainty mechanism (our business plan tables do include the investigation here). We note that our local EA has expressed concerns about the inclusion of an improvement scheme in WINEP too, and this would allow them to provide their view to both Northumbrian Water and Ofwat about the suitability of proposed options and costs once this information is known (rather than allowing contingent funding now). We note that in other areas, Ofwat has rightly observed that costs for improvements remain uncertain where investigations are not completed yet – and has removed funding at DD for this[294]. In addition to this, we are aware that the Bathing Water Regulations 2013 may be revised to make changes to the automatic de-designation of bathing waters that are Poor for five consecutive years. This would also impact the need to undertake other improvement schemes in AMP8 after an investigation has concluded. This should also be included in the uncertainty mechanism.

997. For Littlehaven, this is particularly important because this is a bathing water on a large estuary – so sources contributing to a poor status are likely to be wide and varied. It is unlikely that any resolution following the investigation will be achievable in the AMP. In this case, it would be important to include this within the uncertainty mechanism to begin this work.

998. We also believe that the uncertainty mechanism should be **expanded to cover any new standards emerging from its recent and ongoing wastewater enforcement activities**. We will respond to the enforcement notice directly in September but we do not recognise several of the standards that Ofwat is promoting in its enforcement notice, which differ from those applied in the permits we hold with the Environment Agency and other regulations and guidance. As such the standards are not ones that we have been funded to maintain in previous price reviews and we consider that, based on a reasonable interpretation of how Ofwat sees them applying in the notice, the uncertainty mechanism needs to be expanded to address those costs. An early assessment of those costs suggests that they could be around £900m for NWL's asset base. Whilst this is an early estimate and clarity is also needed on the standards it is clearly a material cost that is currently unfunded.

999. We expect that Ofwat will propose more detail about this uncertainty mechanism at FD. Since storm overflows investigations are generally concluded by April 2027, it seems sensible to assume that improvements can start from April 2028 – and so this relates to the last two years of AMP8.

[294] See NES81 as part of our response, on possible mud pumping at Trinity Broads

1000. Ofwat could potentially use something similar to the accelerated delivery process or Green Recovery determinations to achieve this, though it may be possible to have a much lighter touch approach. For example, Ofwat's cost model at PR24 already sets the efficient costs for storage, and this could be used to make changes to totex allowances much more efficiently and quickly. Ofwat could still assess outliers or schemes that will overlap beyond 2030 in more detail, including for example the Littlehaven bathing water improvements (if needed).

11.2. BRINGING FORWARD SERVICE RESERVOIR REPLACEMENTS

1001. In our resilience appendix (NES09), we explained the work we had done on asset health at service reservoirs. Investment to replace tanks at service reservoirs were considered a high priority by our customers – along with water treatment works and wastewater treatment works – as they relate to the main function of the company to provide a safe water supply. As a result of our customer research, we looked at potential options for balancing affordability against an increased investment in asset health.

1002. This challenge led to us removing our planned expenditure in 2025-30 for service reservoirs and so include some mains replacement without changing the overall level of investment for asset health – and so remaining close to the level of investment that our customers supported in our qualitative research.

1003. In our long-term strategy, we said that "beyond 2030, we consider that capital maintenance expenditure will need to increase further" – for our core pathway, we used an estimate of a 40% increase in investment from 2020-25 levels, starting in 2030. This was a conservative view that represented a minimum "no regrets" increase. We noted that "the required level of investment could be significantly higher". We said that the decision point for this would be 2028, ready for investment from 2030 onwards, and decisions would be made at each subsequent price review to determine the most appropriate level of capital maintenance investment. So, we have subsequently initiated and led work to examine the evidence and best approach for future regulation to enable this – working with other companies, regulators, and stakeholders to begin these conversations.

1004. As set out in NES36A, we now have a further opportunity to bring forward some "no regrets" investment from AMP9.

1005. Historical industry spend on service reservoirs is primarily driven by maintenance rather than replacements. These maintenance costs are increasing – our costs are now around £50m of base capex in each AMP, a rise from £21m in AMP6 to forecast £50m in AMP8. Our intervention costs are increasing because of material costs and limited specialist contractors; and the proportion of reservoirs requiring investment after inspections has increased from 50% to 90%. In AMP7, it has been a challenge to absorb these costs – through efficiency and re-prioritisation.

1006. We have replaced one service reservoir under base allowances since 2010 – our Hebron reservoir – and built one new reservoir in enhancement (Springwell). Replacement costs due to aging assets are not generally captured in

Ofwat's base models which use historical expenditure – these allowances do not include new replacements for service reservoirs. The step change in base maintenance compounds the funding challenge to replace service reservoirs.

1007. Our maintenance strategy for AMP7 – and in line with our business plan for AMP8 – is to deliver interventions to extend the lifespan of service reservoirs. Some of these repairs, such as "overbanding" to repair leaking structures, have a lifespan limited to around 15 years. Asset deterioration and the instructions for use of approved products has meant that these repairs can only be carried out three times, and then replacement is needed. In the past, we have used liners as a last resort for extending the life of service reservoirs – but UKWIR issued guidance in 2017 which increased the assessment of risk of deterioration for reservoirs with liners, stating that where there is risk of ingress behind a liner, the structure should be assessed as Grade 5 (poor). Liners are therefore considered inappropriate in conditions where ingress due to wall and floor deterioration is a risk and therefore significantly limits the application of liners for refurbishment of end-of-life assets. As such, liners are omitted from section 9.4 of the UKWIR guidance which covers best practice.

1008. We have a long-term plan to replace our service reservoirs that have a masonry construction due to higher risk and a higher likelihood of failure. These particular service reservoirs are old (mostly Victorian-era), have reached the end of their lives and require excessive maintenance. The DWI supports our plan to replace service reservoirs with masonry construction.

1009. We planned to replace five reservoirs in AMP9, at a cost of £62.4m. We considered including this investment in our AMP8 plan and discussed this with customers – who agreed they would invest now if it would deliver value and reduce future step increase in prices. With a shift in affordability since the business plan, we could now bring the majority of this forward to AMP8. This aligns with decisions to delay some investment in monitoring to AMP9 (which will increase our AMP9 plan).

1010. We expect to continue with a multi-AMP approach to replace service reservoirs, and we are working on the longer-term replacement plan, including inspections. The pace and extent of the asset replacement plan will depend on what we expect to be increasingly stringent expectation from DWI and the evolution of requirements for reservoir inspections for smaller reservoirs – as well as developing the evidence on long term deterioration of asset health. We provide evidence of the link between asset condition and age/maintenance cost, to show the future impact of this requirement.