COST CHANGE
PROCESS

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NORTHUMBRIAN WATER COST CHANGE DD RESPONSE

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1. EXECUTIVE SUMMARY

1. This document sets out the response of Northumbrian Water Limited (NWL) to Ofwat's Draft Determination (DD) of its 'Cost change' process. We welcome the opportunity to respond to Ofwat's DD and are happy to provide any further information that Ofwat requires ahead of its Final Determination (FD).

WE WELCOME THE DD AND THE APPROACH OFWAT HAS TAKEN WHICH PROVIDES A STRONG FOUNDATION FOR A NEW 'SUPERVISORY' MODEL OF REGULATION

2. We welcome the approach Ofwat has taken in the DD which shows a number of important departures from the way it has regulated in the past. In particular, we support the greater level of engagement that Ofwat has made with companies during the process with more opportunities for dialogue and debate as well as taking greater account of company specific information. We consider that this is a key part of the move to a more 'supervisory' model of regulation that was recommended by the Independent Water Commission (IWC) report[1] and the Water White Paper[2]. We hope that the remainder of the process can follow a similar open dialogue and make some suggestions about where that might be helpful.

THE ADDITIONAL FUNDING FOR ASSET HEALTH WILL ALLOW THE SECTOR TO BEGIN TO REFURBISH AND REPLACE SOME OF THE MOST CRITICAL ASSETS IN THE WORST CONDITION

3. The board of NWL was pleased to see the draft funding decisions taken in the cost change DD. We have consistently argued that significant additional expenditure is needed to improve the condition of the complex asset base that we must maintain. The additional c.£1.3bn of funding that Ofwat has provisionally provided would allow the sector to finally begin to address what we consider to be the biggest underlying risk to the continued safe and effective delivery of the core essential water and wastewater services that every customer in the country relies upon. Evidence consistently shows that customers support greater investment in maintaining the asset base and recognise the importance of stable or improving asset condition[3].

OUR CUSTOMERS WILL NOT FACE BILL RISES DRIVEN BY THE COST CHANGE PROCESS IN THE SHORT TERM BUT FUTURE BILL CHANGES MUST REFLECT THE STEADY AND PREDICTABLE PROFILE CUSTOMERS CONSISTENTLY SAY THEY PREFER

4. We withdrew our request for additional in-period bill increases from customers based on real concerns around the cost-of-living challenges that they are facing. We continue to consider that customers should not face bill increases next year from the new investments identified through the cost change process. We will not request additional bill

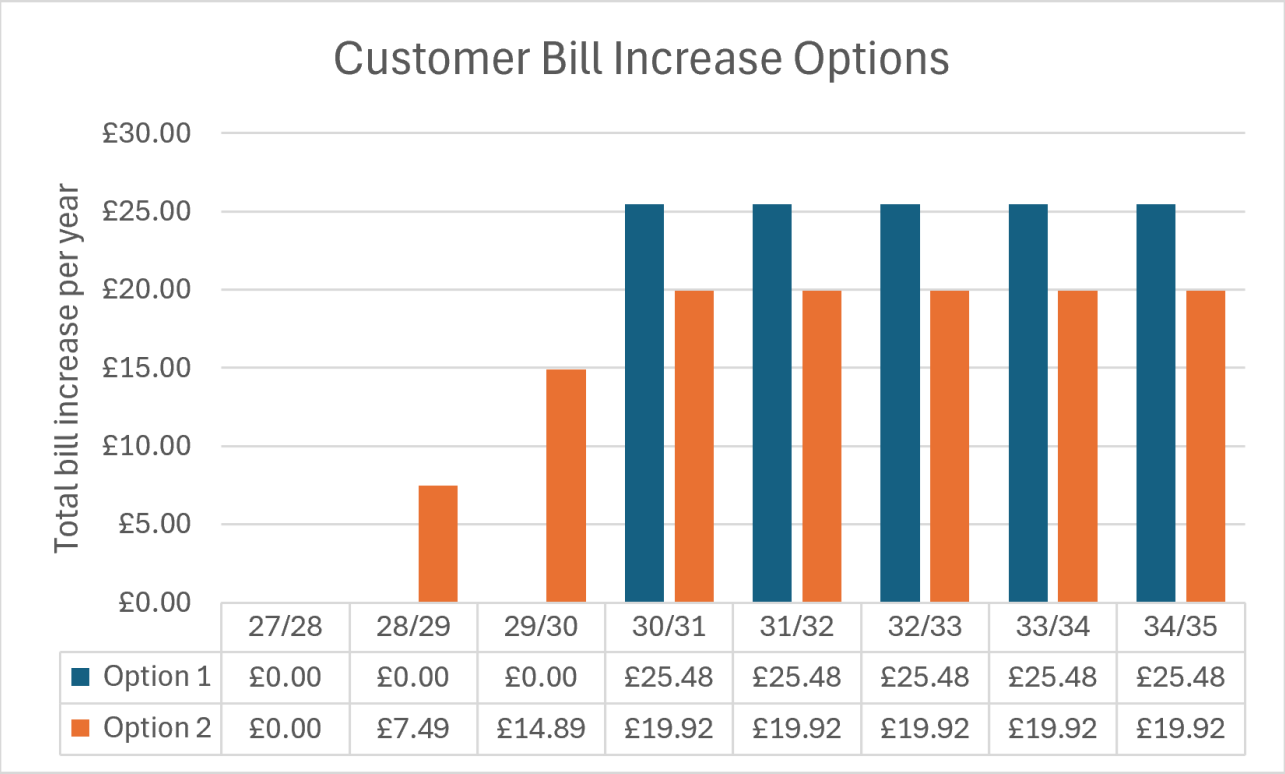
[1] Independent Water Commission: review of the water sector - GOV.UK
[2] Defra water white paper 2026 (with correction slip)
[3] Customer priorities tracking research (Wave 2) - CCW, "keeping pipes and sewers in good working order" or asset health is the third highest priority for customers in the most recent CCW research.

increases to fund these projects until we have made further progress with our current investment programme but overall bill profiles over the longer term need to reflect what customers want to see.

5. We have undertaken research with 962 of our customers[4] in response to the Ofwat DD to understand their preferences around the long-term profiling of bill increases. That research presented customers with two different bill profile options, one involving phased increases over time beginning in 2028 and one with increases delayed until 2030 (as per the DD). The results suggest that 67% of customers would prefer steady bill changes over time rather than a single bill adjustment in 2030. This is consistent with lots of other previous research which has been undertaken elsewhere[5].

6. We show extracts from our customer research findings below.

FIGURE 1 – CUSTOMER RESEARCH BILL PROFILE OPTIONS

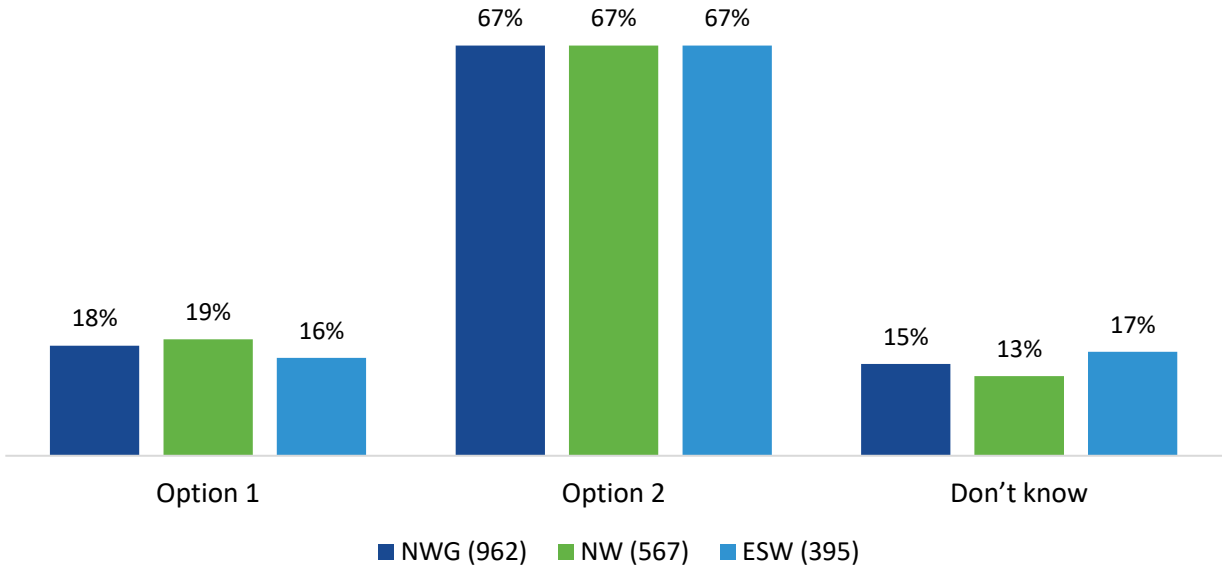


	27/28	28/29	29/30	30/31	31/32	32/33	33/34	34/35
Option 1	£0.00	£0.00	£0.00	£25.48	£25.48	£25.48	£25.48	£25.48
Option 2	£0.00	£7.49	£14.89	£19.92	£19.92	£19.92	£19.92	£19.92

Source: NWL customer research

[4] For both Operating Areas. NES-CCP-DDR-01 - Customer bill profile preferences - September 2026. We provide this alongside our response.
[5] pr24-research-and-engagement-activities/deliberative-research-into-complex-bill-drivers-for-2025-30---final-report.pdf p70-75 SVT Cost Change Customer Research Section 10

FIGURE 2 – CUSTOMER RESEARCH ON BILL PREFERENCES RESULTS



Source: NWL customer research

7. We discuss these matters further in Section 7. Given the many different mechanisms driving bill incidence for customers in the regulatory framework and the clear preference for steady bill changes over time we propose to continue these discussions with Ofwat in future years. This will also allow us to make progress with our current investment programme.

WE WELCOME OFWAT'S DRAFT DECISIONS IN RELATION TO OUR LONG SEA OUTFALL (LSO) PROJECT DESIGNED TO SUPPORT NUTRIENT NEUTRALITY LEGAL REQUIREMENTS. WE HAVE PROVIDED THE ADDITIONAL EVIDENCE REQUESTED.

8. The DD provisionally provides all of the funding we requested for the LSO project but requests additional evidence to support that decision ahead of the FD principally in relation to the need for a single controlled cost estimate and stronger links to the programme schedule. We have provided that additional evidence which can be found in section 6.

WE HAVE ACCEPTED MANY OF OFWAT'S PROPOSED ADJUSTMENTS TO OUR ORIGINAL PROPOSALS BUT ALSO MAKE SOME TARGETED CHALLENGES TO THE DD

9. Ofwat has challenged our proposals in a number of areas including in relation to 'what base buys' for gravity sewers and the scope of some of our other investment cases.

10. Ofwat has proposed a different method to calculating 'what base buys' for gravity sewers which results in a £39.7m adjustment to our requested funding. We still consider that the approach based on lengths rehabilitated has merit but

accept that Ofwat has now used this method consistently across all companies. However, we have been unable to replicate Ofwat's DD position from the underlying workbook that has been provided and raise some concerns in Section 2. Ofwat has already recognised and accepted many of these points as part of a query response (query CCP26-NES-IBQ-005).

11. Ofwat rejects some of our proposed asset health investments as 'out of scope' of this process. This includes rejecting investment for any asset that has been out of service before 2023 and some challenge to whether the scope of work we are requesting is entirely for asset health or broader reasons that are not the purpose of the cost change process (e.g. resilience or day-to-day maintenance). Based on these definitions, Ofwat has removed in its DD three of our proposed borehole investments and adjusted allowances to remove some activity that it considered to be out of the defined scope (e.g. pumps). It has also excluded investment to replace one of the four tanks at Washington Wastewater Treatment Works (WWTW) that we were seeking.

12. We do not accept many of the justifications Ofwat has provided for some of these scope challenges as we do not consider that they will be in the long-term interests of customers (see Section 3). However, we accept many of the proposals in the DD, specifically we:

- challenge the exclusions for some of the borehole investments (£5.1m[6]) at Saxmundham, Fowberry and part of the scope at North Dalton where we provide a strong operational case for their inclusion (see sections 3.1 and 3.2); and
- can accept the exclusion of the fourth tank at Washington WWTW on the basis that currently the site operates using only two of the four tanks and the fourth tank therefore adds smaller incremental value than replacing the third one alone. However, we explain why it would be more beneficial to include the fourth tank as well (see section 3.3).

WE PROVIDE ADDITIONAL EVIDENCE IN SEVERAL AREAS REQUESTED BY OFWAT ON WHICH WE HOPE TO HAVE A CONTINUED DIALOGUE AHEAD OF THE FD

13. Ofwat has requested several specific areas of new evidence including:

- an outline of the other drivers that increase water network storage inspection frequency (see section 4.1.1);
- a simple clarification in relation to the Stoneygate service reservoir where we believe the use of the term 'inoperable' (a term used by the Drinking Water Inspectorate) may have created a misunderstanding of the status of the reservoir (see section 4.1.2);
- evidence of site-specific analysis of the efficient costs of our service reservoir cases and that the independent cost benchmarking provided by Turner and Townsend (T&T) was bespoke to our schemes and not based on more generic models and benchmarks. We provide a more detailed breakdown of the cost estimates provided in section

[6] £2.48m for Saxmundham, £0.15m for Fowberry Mains B and £2.46m for North Dalton.

4.1.3 including where we have used site-specific information and also have a separate note from T&T explaining how the models were bespoke (see Section 4.1.4);

- evidence of site-specific delivery risks for our borehole sites (see section 4.4.1); and
- an explanation of the 7% movements in costs between the CMA representations and the cost change submission for the service reservoirs (see Section 4.1.5).

14. We hope that this new evidence is uncontroversial and will meet Ofwat's requirements but if you have any further concerns we are happy to address them either through further discussion or in response to targeted queries.

15. Ofwat is also seeking updated cost benefit assessments (CBAs) for the options we appraised for the borehole and some of our wastewater civil structure investments. In response to the feedback provided and reflecting on the analysis undertaken by other companies, we have sought to expand our previous CBA approach. We now consider the consequential costs of asset failure (e.g. tankering costs, etc) and the benefits of extending asset lives in terms of avoided maintenance costs in the future. We have now incorporated these elements into the CBA assessments (see section 4.2.1 for boreholes and section 4.2.2 for wastewater civils) and provide the underlying workings to demonstrate the calculations. We note that these assessments always require a degree of operational judgement and engineering expertise and we seek to set those judgements out in the response transparently.

16. Finally, we highlighted some gaps in the condition grade scores for some of the borehole assets when we made our original submission and Ofwat have requested this evidence via a query. We set this evidence out in section 4.4.2.1.

2. WHAT BASE BUYS

17. Except for gravity sewers, Ofwat has adopted our view of what base buys. We welcome this approach and the recognition of the uncertainty in how it should be calculated.

18. In the area of gravity sewers, we developed our submission using the same approach for what base buys as Ofwat had used for water mains as part of the PR24 determination. This assessment was based on the percentage of mains rehabilitated across the sector to form an estimate. We see that Ofwat has used an expenditure approach (the percentage of base costs spent on sewer rehabilitation) because of the differences in the intervention types and associated costs adopted by different companies.

19. We still think that the water mains approach has merit, indeed Ofwat also did at a point in time,[7] as it encourages companies to be efficient in their sewer rehabilitation activity from base. However, we acknowledge the point that intervention costs vary significantly depending on the activity which is illustrated by the difference in our own relining versus sewer replacement costs and support a common approach being taken across the sector. We therefore understand why an approach using expenditure instead is reasonable in this context.

20. Whilst we can accept the use of an expenditure driven approach, we do not agree with the details of how Ofwat has applied it in the draft determination. In particular we are concerned that:

- the measure of expenditure used by Ofwat does not exclusively cover base expenditure and also includes enhancement spend;
- the outturn expenditure used for total base expenditure uses the wrong timespan;
- the Ofwat PR24 FD base allowances have been used instead of the CMA's redetermination which applies to Northumbrian; and
- there are some discrepancies in the numbers Ofwat has shared under its approach which we have been unable to replicate.

21. Once these issues are addressed we think the estimate of what base buys decreases from £77m to £67m.[8]

FIGURE 3 - NES WHAT BASE BUYS (WBB) ESTIMATE FOR SEWER REHABITILATION

	Sector average spend %	Sector median spend%	Triangulated sector spend %	AMP8 allowance (£m)	WBB (£m)
NES	8.3%	8.7%	8.5%	789	66.8

Source: NWL analysis of Ofwat's workload and expenditure dataset.

[7] Slide 29 of the workshop 7 slides sets out this view, Workshop-7-211025-UPDATED.pdf
[8] The workbook accompanying query CCP26-NES-IBQ-005 sets out our workings and sourcing of data for this calculation.

22. We have shared these concerns with Ofwat via a query[9] and welcome the response we have received from Ofwat. However, we do not agree with the position that the response takes on the inclusion of enhancement expenditure. We discuss this and the other areas of concern below.

2.1. THE MEASURE OF EXPENDITURE SEEMS TO INCLUDE ENHANCEMENT EXPENDITURE

23. The data request that covered the workload and expenditure data for gravity sewers provided the following definition for the expenditure:[10]

> We ask companies to report expenditure data that aligns with data reported in APR table reference 7C.14, gravity sewers rehabilitated, and other expenditure (as defined in table 1).
>
> The referred to APR definition is the total length of sewer renovated or replaced in the report year. The length reported is the actual length physically renovated rather than the distance between the manholes either side of the section of pipe in question.
>
> The workload template asks companies to report historical rehabilitation (reported in kilometres) split by base and enhancement funding over the historical period.

24. As the guidance points out, the APR definition is the total length of sewer renovated or replaced in the report year. It is included in Table 7C which contains wastewater network plus sewer and volume data. For instance, it also contains sewer length information for the entire network. It does not distinguish between base or enhancement activities and must contain activity covering both.

25. For the expenditure data to align with the data reported in this table, it must therefore also include base and enhancement expenditure. The workload and expenditure data request did not ask for a breakdown of this spend between base and enhancement. The only breakdown between base and enhancement was for the lengths of activity – we presume this is because at the time Ofwat assumed it would replicate the approach to water mains which relied on length information rather than expenditure information which was Ofwat's preferred approach five months after the guidance was issued as set out in the workshop 7 slides.[11]

26. Since the evidence points towards the expenditure including enhancement spend, we think it overestimates what base buys as the enhancement element needs to be taken out. This cannot be done perfectly as enhancement rehabilitation jobs may not be the same as base activity, e.g. enhancement activity might be more likely to increase the capacity of sewers which will involve the laying of a new sewer which will be much more expensive than relining an existing sewer. At the very least the proportion of length rehabilitated as enhancement should be deducted from the expenditure values.

[9] Query CCP26-NES-IBQ-005, submitted to Ofwat on 28/08/2026.
[10] Workload-and-expenditure-data-request-10-September-2025.pdf page 18
[11] Workload-and-expenditure-data-request-10-September-2025.pdf page 18

27. In the response to query CCP-NES-IBQ-005 Ofwat:

- Confirms that expenditure data has not been adjusted to remove enhancement spend; and
- States that it considers "this approach is reasonable in the round: there are both arguments for its inclusion and exclusion and for other areas enhancement expenditure is included; there are other means of estimating the WBB allowance which could potentially have larger impacts; and set against the overall CCP allowance the impact is small."

28. We disagree with the second element that it is reasonable not to remove enhancement spend for the following reasons.

29. First, we are not aware of any arguments for the inclusion of enhancement expenditure. The aim is to estimate what base buys and not what totex buys so it must be more accurate to exclude enhancement expenditure. We don't see any reason why it would be preferable to overestimate what base buys by including enhancement spend.

30. Second, we do not think it is correct to say that "for other areas enhancement expenditure is included". The guidance for the workload and expenditure date request said the following:[12]

> Where relevant, we would expect the costs reported in this data submission to align with costs reported historically in annual performance report (APR) submissions, and subsequently in the PR24 water and wastewater feeder model 1 (up to 2023-24) under the lines below.
>
> • Water (WR / TWD / Treatment / Wholesale water): Renewals expensed in year (non-infra)
>
> • Water (WR / TWD / Treatment / Wholesale water): Maintaining the long term capability of the assets – non-infra
>
> • Wastewater (Sewage collection / Sewage treatment): Renewals expensed in year (infra)
>
> • Wastewater (Sewage collection / Sewage treatment): Renewals expensed in year (non infra)
>
> • Wastewater (Sewage collection / Sewage treatment): Maintaining the long term capability of the assets – infra
>
> • Wastewater (Sewage collection / Sewage treatment): Maintaining the long term capability of the assets – non-infra

31. The cost lines that the data request was required to align with only cover base expenditure. The expensed renewals and the maintaining the long term capability of the assets expenditure lines of the APR are within tables 4J and 4K

[12] Workload-and-expenditure-data-request-10-September-2025.pdf see pages 5-6

which exclusively cover base expenditure. This means that that the expenditure submitted by companies on other assets will *not* include enhancement expenditure as that would not be covered the relevant lines in tables 4J and 4K.

32. Third, Ofwat states that other method may give higher estimates of what base buys. This may be true but there are also other methods that produce lower estimates such as our approach which assessed the percentage of mains rehabilitated which followed the approach for water mains at PR24. We don't think this is a justification for using an overestimate of what base buys through the inclusion of enhancement expenditure.

33. Finally, whilst the impact of removing enhancement spend might be small in the context of the overall cost change process it is not insignificant. For us it has a £3m impact which we consider to be material enough to correct an error for which we have supplied the solution in the workbook accompanying our query.

34. For the reasons above, we continue to believe that Ofwat should deduct the proportion of sewer rehabilitation that is enhancement from the expenditure data used to estimate what base buys.

2.2. THE TIMESPAN USED FOR TOTAL OUTTURN EXPENDITURE

35. The expenditure method relies on dividing the spend on the asset by total spend on modelled base costs over the same time period. It appears that Ofwat has used 14 years of data on sewer rehabilitation costs as the figures most closely align with that time period. However, for the denominator it does not appear that 14 years have been used. A consistent timespan must be used to make a meaningful inference on the percentage of historical base spend that has gone to gravity sewer rehabilitation.

36. For all the other asset types, Ofwat has based its estimates of what base buys on 10 years of data as that is all that was collected as part of the workload and expenditure data request. The spreadsheet shared with us[13] uses the same outturn expenditure as the other assets which is labelled as AMP6 and AMP7, i.e. a 10-year period. For gravity sewers, a 14-year period should be used to align with the spend on gravity sewers.

37. Ofwat has agreed with this in its response to our query.

2.3. THE CMA'S BASE ALLOWANCES SHOULD BE USED

38. The workings that Ofwat shared show that the wastewater network plus allowances used by them use the PR24 FD allowances. However, our allowances were redetermined by the CMA and are lower than those from the PR24 FD. The CMA reduced our wastewater network plus modelled allowances by £23m which means that the use of the PR24 FD allowances overestimates what base buys in our case and should be corrected. Without this correction the estimate of what base buys will not be accurate for Northumbrian Water (and the other CMA appellants) as it will be based on a higher level of base funding that we do not have.

[13] Ofwat's response to query CCP26-NES-IBQ-001.

39. Ofwat has agreed with this in its query response and stated that it will investigate which figures are appropriate for the FD.

2.4. DISCREPANCIES IN THE NUMBERS SHARED IN OFWAT'S WORKINGS

40. In addition to the issues outlined above we have identified discrepancies in the numbers shared by Ofwat following our query CCP26-NES-IBQ-001[14]. Ofwat has indicated in its query response CCP26-NES-IBQ-005 that this is due to rounding of CPIH inflation figures and out of date CPIH data for 2024/25. We think this resolves the issues we identified.

2.5. OUR VIEW OF WHAT BASE BUYS UNDER THE EXPENDITURE METHOD

41. When we make the adjustments outlined above for: removing enhancement costs, using the 14-year time period for both expenditure measures, using the CMA's allowances, and using the numbers we can source from the data request and base cost feeder model we get an estimate of what base buys of £67m instead of Ofwat's £77m.

42. This would alter our request under the cost change process to the following as set out in the table below.

FIGURE 4 – UPDATED TOTAL REQUEST FOR GRAVITY SEWER REHABILITATION CASE (2022/23 PRICES)

	Capex (£m)
Additional investment	111.5
AMP8 base plan	72.5
Implicit allowance	66.8
Maintenance savings	0
Total request	117.2

Source: NWL analysis

[14] Ofwat responded with their WBB databook on the 25/08/2026

3. OUT OF SCOPE EXCLUSIONS

43. Ofwat has excluded some of the specific assets where we proposed investment in its DD. In the sections below, we examine some of the excluded investments in more detail. We ask Ofwat to consider this evidence and **reinstate three** of our investments.

44. This includes two boreholes which were out of service before October 2023 (Saxmundham and Fowberry Mains B). We explain why these were mothballed from use, and why these are now necessary to refurbish/replace, in section 3.1. This also includes one borehole where Ofwat has excluded this due to the specific assets being out of scope (North Dalton). We accept that some of the work should not be in scope, and we provide a breakdown in section 3.2 that shows some elements of the work is in scope – we ask for these elements to be funded in the cost change process.

45. We can accept the other excluded investments, though we think Ofwat is wrong on three points:

- We do not think it is right to automatically exclude investments that were out of service before October 2023 (we explain this in more detail in section 3.1), and that an evidence-based approach that looks at specific assets would be more appropriate.
- We do not think it is right to exclude the Wells and Bores Minor Works programme from the assessment of asset health, as this programme is for small-scale refurbishment and replacement of these assets (and so there is no reason this should be out of scope). However, we can accept that the implicit allowance broadly matches and covers these costs.
- We do not think it is right to automatically exclude projects that began in AMP7, as these are still refurbishment and repair costs for projects that are in scope, which would be incurred in AMP8. We note that a project that had simply been delayed until AMP8 would be eligible for the cost change process – it does not seem sensible to penalise companies for addressing these issues earlier (particularly when we also overspent our implicit allowance in AMP7). However, we do not challenge Ofwat's decision on these specific individual schemes because these are not material.

46. We also do not think it is sensible to delay investments that are needed simply because of the driver. For example, our project at Saxmundham boreholes could be seen as a water supply/resilience project that is needed to meet the supply/demand deficit in this area – and so could be included in our PR29 business plan instead. However, this would be an unnecessary delay when it is clear that this is needed.

47. In section 3.3, we describe the specific exclusion of the fourth Primary Settlement Tank (PST) at Washington Wastewater Treatment Works (WWTW) in more detail. Although we can accept this decision for the cost change process, we explain the risks of excluding this so that Ofwat has full transparency about its decision. We expect to assess this again for PR29.

3.1. ASSETS EXCLUDED AS OUT OF SERVICE

48. Ofwat has automatically excluded assets that were out of service before October 2023 and says that returning these assets to service is primarily associated with increasing supply resilience rather than improving asset health. It says that once an asset has failed, there is limited likelihood of further deterioration having a direct consequence for supply.

49. We do not think it is right to do this automatically. In some cases, we have reluctantly mothballed assets reluctantly from service – because we had to prioritise within our base allowances for capital maintenance; and because there were other assets available at the time that could make sure there was no unacceptable risk of loss to service. In these cases, it was the right decision for customers to delay replacements when they were not immediately critical, because these assets operate as part of integrated systems. This does not mean that these assets would not eventually need to be replaced following changes in risk over time across the system.

50. Instead of an automatic threshold date for exclusion, Ofwat should use an evidence-based approach that looks at whether an investment efficiently restores or protects the condition, integrity, and operability of an existing priority asset – not simply whether the asset was contributing to supply in October 2023.

51. We strongly support Ofwat's adoption of a more supervisory approach to cost assessment, which places greater weight on company-specific evidence and seeks to minimise interventions where companies provide sufficient and convincing evidence. However, a blanket exclusion based only on asset status in October 2023 seems to be inconsistent with that approach. It does not seem sensible that two almost identical assets in the same condition should receive different regulatory treatment simply because one was withdrawn shortly before October 2023, and the other shortly afterwards.

52. It is also not reasonable to conclude that companies had an opportunity to seek funding for assets already out of service when initial PR24 business plans were submitted in October 2023. The current asset health assessment framework did not exist at that point, including the supporting evidence framework (such as the historical workload and expenditure data, asset condition information, common methodologies, and detailed evidence expectations). We did seek funding for asset health in our PR24 business plan, but we could not have anticipated that Ofwat's process would exclude some of those asset classes and instead include boreholes (for example). Indeed, whilst we did seek investment in some asset classes only part of that investment has been considered in the cost change process, consistent with the scope of assets eventually covered by that process.

53. Assets that are genuinely redundant or have no efficient future system role should be excluded. However, this conclusion should follow from an asset-specific assessment, not only from the date on which the asset was taken out of service.

3.1.1. Saxmundham

54. Saxmundham has been classified as out of scope due to being out of service before October 2023.

55. However, while we have been able to meet demand resiliently without the borehole in previous years, we now need the Saxmundham boreholes in service due to specific developments in the area. This can only be achieved through drilling the proposed borehole.

56. The Saxmundham borehole is included in our WRMP24 baseline supply forecast and will be needed to support projected household growth in the Blyth Water Resource Zone. This includes the South Saxmundham Garden Neighbourhood, which is expected to deliver around 800 homes over the next 5–10 years, as well as several smaller committed and emerging developments, including the former Fromus Centre and other infill schemes in and around the town of Saxmundham. Developing a replacement borehole could take up to three years, allowing time to secure EA drilling permits, complete drilling and testing, undertake any environmental appraisals and secure the abstraction licence variation to add the new borehole as a new point of abstraction.

57. The two existing boreholes at Saxmundham have been out of use for 11 years due to turbidity failures and poor borehole condition causing risk of ingress of contamination and collapse. At the time, we concluded we could resiliently meet demand using Benhall and Coldfair Green WTWs (Water Treatment Works) elsewhere in the system. Additionally, in AMP6, the Environment Agency provided formal guidance that we should not plan to increase abstraction above recent actual utilisation from our Suffolk groundwater sources in order to prevent a deterioration of groundwater body status (aka the “No Deterioration” policy). As the Saxmundham borehole recent actual abstraction levels were very low in the preceding years, the allowable abstraction going forwards was also very low and meant it was not appropriate to invest in the boreholes at that time.

58. Subsequently, and following further groundwater modelling and groundwater body deterioration risk assessments, unlike all other Suffolk groundwater sources, Saxmundham licensed abstraction will currently not be subject to abstraction licensed quantity sustainability reduction under the Water Framework Directive’s ‘no deterioration’ obligation and only a very small sustainability reduction under the Environment Agency’s National Framework 2. The other assets in the area are subject to these reductions, which makes it increasingly more important to bring the Saxmundham boreholes back into service, to ensure we can continue to resiliently meet demand.

59. In our cost change submission, we proposed that we would drill a new Saxmundham borehole, to replace the two existing boreholes. Saxmundham (WRMP24 Groundwater Deployable Output (DO) Technical Report[15]) will provide 0.78Ml/d (5.3% average DO) of water supply needed to meet our WRMP Distribution Output for Blyth Water Resource Zone which requires an average capacity of 14.68Ml/d. We had already planned to drill this new Saxmundham borehole from our base expenditure allowances – to support our other WRMP supply projects that were funded from enhancement expenditure. This is not, however, affordable from the base funding for such projects (as defined by the implicit allowance). As a result, we currently are relying on additional critical period tankering to meet demand because of this funding shortfall.

[15] NES-CCP-DDR-03 - ESW_Groundwater Deployable Output and Climate Change Final WRMP24 Technical Report. We provide this with our response.

60. Investing now will ensure we can manage the system of assets to meet the demand pressures in Suffolk. Alongside the (funded) investment in Benhall boreholes, this investment will ensure we can effectively maintain and manage our borehole assets in the area and deliver reliable services.

61. It was the right decision for customers to delay replacements for the Saxmundham boreholes in the past, because it was not necessary before WRMP24 (as there was no supply/demand deficit). These were clearly taken out of service due to asset health risks, water quality and investment was delayed due to the EA's "no deterioration" policy at that point in time. Increased pressure in Suffolk means that this asset health should now be addressed.

62. This means we think this should be in scope for the cost change process. Alternatively, we can submit this borehole in the PR29 case, however this would delay this essential supply for longer and increase risk of service interruptions and impacts.

3.1.2. Fowberry Mains B and Fowberry System

63. Fowberry Mains B has been classified as out of scope due to being out of service before October 2023. However, we feel that Ofwat should revisit this decision due to the impact of the outage of this borehole on the surrounding network. We explain below the context of the relationship between the four borehole assets and how Fowberry Mains B was taken out of service, and why we require it to be back in.

3.1.2.1 The Fowberry system and why Fowberry Mains B was taken out of service

64. Fowberry Mains B borehole is part of a system of four, as shown in Figure 5, there are two bores at a site called Fowberry Mains, with bores A and B. There are two bores at the Fowberry Treatment site, called Treatment 1 and 2.

65. Fowberry Mains B has been out of service (mothballed) as levels of iron and manganese and turbidity started to come from the bore. Prior to 2023, the Fowberry Treatment site treated all four borehole flows through one process. There was only simple treatment process on the site using Ultraviolet light (UV), pH adjustment and sodium hypochlorite disinfection. There was no ability to treat turbidity, iron and manganese. Therefore, when the water quality of Fowberry Mains B deteriorated due to high iron, manganese and turbidity levels, it was taken out of supply (mothballed). The remaining three bores were used to meet demand.

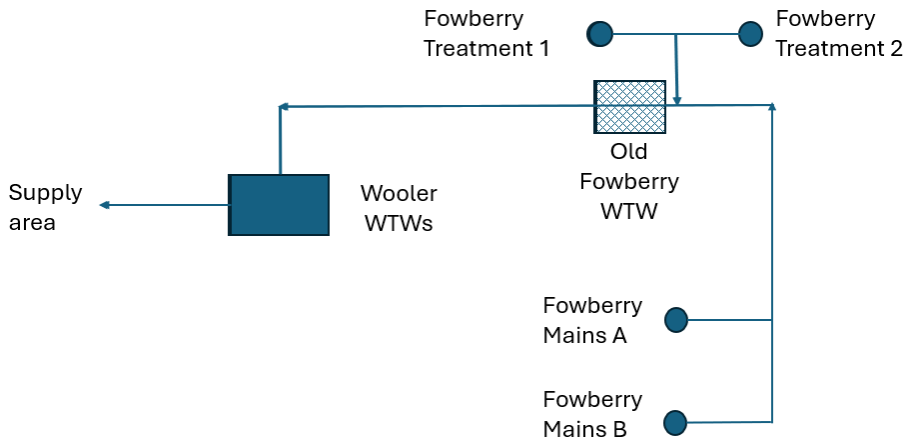
66. This temporary removal from service of Fowberry Mains B was to prevent water quality failures from occurring due to the high levels of iron, manganese and turbidity. The demand from the supply area could be met by the remaining three bores.

67. Recognising that the borehole quality was deteriorating and significant operational impacts from shut downs and call outs due to faults at Fowberry WTW, a project to build a brand new water treatment works was completed in AMP7. This works was built in the supply area in Wooler and the works came online in 2023.

68. However, since 2024 the borehole at Fowberry Mains A has also started to deteriorate with high levels of turbidity. Levels that are too elevated to pass onto the new Wooler WTW. We have been meeting demand from two of four

boreholes. Whilst this has met demand there have been operational and maintenance impacts. The only way to carry out any maintenance of Fowberry Treatment 1 and 2 is to undertake extensive planning, deploy tankering to bolster supplies and work through the night to minimise the risk to supply due to lack of supply headroom. This is a high-risk approach and means we cannot carry out any maintenance tasks that take longer than 12 hours due to the demand of the supply area. Tankering is therefore the only option to support the area, and the degradation of treatment 1 has resulted in tankering which has caused disruption and can cost around £100,000 per week.

FIGURE 5 - FOWBERRY BOREHOLE SYSTEM

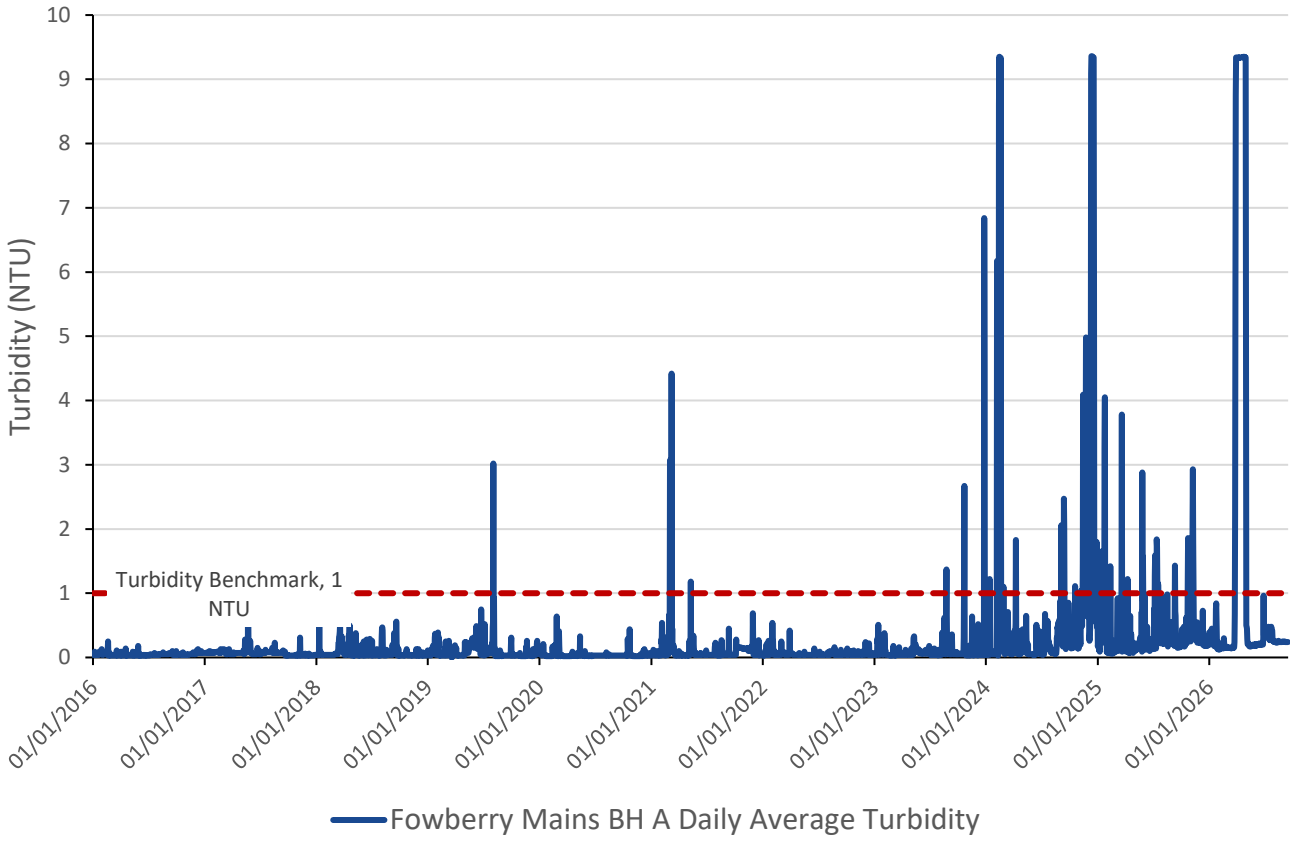


Source: NWL GIS system

69. Figure 6 shows the deterioration in turbidity from Fowberry Mains A. As borehole water is generally of excellent quality, we would expect turbidity levels to be around 0.1 or 0.2 nephelometric turbidity units (NTU) and less than the DWI recommended turbidity at the Regulation 26 point of 0.3 NTU. The chart shows levels that clearly exceed this and the indicator parameter standard of 1 NTU. We have investigated this deterioration and have surveyed and cleaned the borehole, to remove casing encrustation. The survey identified that there is a risk that the seal between the upper casing and the lower drop set has not been grouted and this could be allowing water to enter the borehole. But that risk identified through survey cannot account for the step change in turbidity in 2024. The cleaning did not provide a meaningful improvement in water quality, which suggests that the issue may be environmental and filtration is needed locally to manage this.

70. To improve this, the operational team have worked to install a treatment solution of Amazon filters on the outlet of Fowberry Mains A borehole which would pre-treat the water for turbidity before sending it to Wooler WTW. This should become operational before the end of 2026. This action combined with the headworks funding for Fowberry Mains A, approved at DD, will allow us to effectively use the borehole again, with more reliable and predictable raw water for Wooler WTW.

FIGURE 6 - TURBIDITY AT FOWBERRY MAINS BOREHOLE A FROM 2016 TO PRESENT



Source: Turbidity data comes from our Management Information Presentation System (MIPS) system which stores SCADA data from the on site telemetry

71. The constant use of Fowberry Treatment boreholes 1 and 2, and lack of appropriate maintenance increases the speed of degradation, resulting in poorer asset performance and more costly long-term outcomes. This is why we have asked and have been funded in this process to drill an additional borehole at this site as the resulting degradation of Fowberry Treatment 1 has put it into a position where it cannot be effectively refurbished. This will allow us to abandon the existing Fowberry Treatment 1 bore.

72. Our abstraction licence for the four boreholes allows us to abstract up to 3.6 Ml/d, with only two bores in service we are currently meeting the demand of between 2.5 and 3 Ml/d but it carries significant risk, if demand rises or there is a substantial issue in the supply area there could be a significant interruption to supply. By installing treatment (amazon filters) at Fowberry Mains A we will be able to operate the system on three boreholes which will improve operability for maintenance. However, until Fowberry Treatment 1 borehole is replaced and the new bore operational, we will be relying on a condition grade 5 asset to meet demand.

73. We therefore seek to bring Fowberry Mains B back into service as soon as possible, to achieve a more resilient system and enable timely maintenance and management of the four boreholes. We have proposed to acidise the borehole to mitigate water quality issues and so deal with the concerns that Ofwat suggests are out of scope of the Cost Change

asset health process. Acidisation is a borehole refurbishment technique to clear the borehole casing of blockages and open up the surrounding rock to reinstate better flow and quality. We know that this may not resolve the iron, manganese and turbidity issues and are investigating a localised treatment solution.

74. The work we've proposed in the Fowberry system will result in four operational boreholes in service. We have asked for the drilling of a bore and the refurbishment actions of two bores (with Fowberry mains B having been excluded and the others accepted). While we have coped without Fowberry Mains B, the result of that has been increased degradation, tankering, disruption to customers and the resulting remedial works on the other bores. Without the proposed refurbishment at Fowberry Mains B we will not be able to work the system effectively. With the inclusion, we will be able to hold appropriate inspection and maintenance routines which will sustain asset health.

3.2. NORTH DALTON

75. Our proposed project at North Dalton has been excluded from the scope because "this is standalone and not related to work at an associated borehole". The scheme was included in our original submission as an AMP8 named scheme. There were three work aspects in the project. Borehole improvements, a filtration system and a run to waste system to assist start up routines. In this resubmission we have removed the out of scope elements and have included only the borehole asset maintenance aspects.

76. North Dalton is a borehole site comprising three wells and four borehole pumps. Since 2013 there have been problems with water quality. In particular, turbidity coming from the aquifer causing sample failures and disinfection issues.

77. The North Dalton project is for three main expenditure activities, borehole works which are in scope of the Cost Change process, filters to manage the turbidity coming from the wells, and a new run to waste asset to assist with site start up activities. The run to waste facility includes flow attenuation and dechlorination to ensure no pollution impacts come from operation. The filters and run to waste assets are necessary to ensure water quality and manage the deterioration of the raw water quality and turbidity issues described above. We have stripped out the two out of scope activities (filters and run to waste) and the remaining in scope borehole work is £2,460,088 (2022/23 prices).

78. The in scope items are borehole pipework modifications (removing old and installing new), new borehole pumps, variable speed drives (VSDs). MCC and PLC to manage and control the pumps and VSDs. Headworks modifications and flow meters for flow measurement. These items are all listed in Annex A Table 10 of the Workload and Expenditure data request document from November 2025 as being in scope. We therefore ask Ofwat to include £2.46m within the cost change process for the elements that are in scope.

79. We note that the "out of scope" elements for the North Dalton project are also required to make sure that the benefits from improved asset health are delivered. We will deliver these as part of our wider base programme.

3.3. THE FOURTH PST AT WASHINGTON WWTW

80. We can accept Ofwat's decision to exclude the fourth PST at Washington WWTW from the cost change process. We still think this investment is necessary, but it is not as critical as the requirement to replace the first three PSTs. We are therefore not challenging its removal in the DD. However, we will continue to keep the issue under review for PR29 and request that Ofwat allows sufficient flexibility to replace the assets found to be in the worst condition, based on the outcomes of future surveys and ongoing design development. We set out below some of the reasons why we think the asset is still needed.

81. Washington WWTW was originally designed in the 1960s as a four-PST works, in order to meet the anticipated demand from Washington being designated as a "new town" in 1964. The proposed investment relates to the existing treatment assets that form part of the site's established treatment infrastructure. The need for intervention arises from the deterioration of those assets and the resulting reduction in available treatment infrastructure at the site.

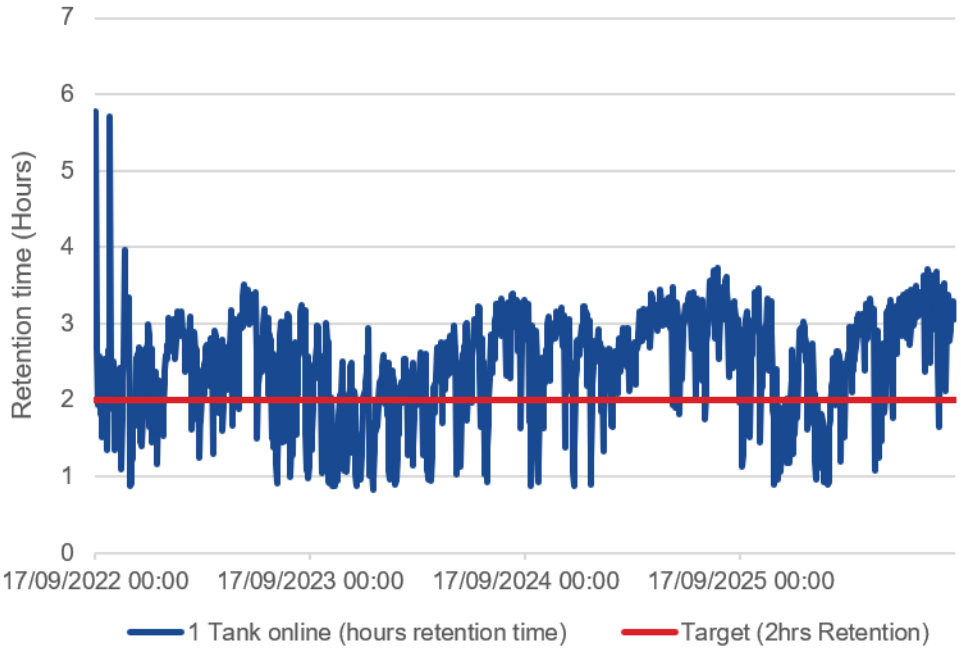
82. The fourth PST became unavailable following deterioration of the civil structure, which ultimately created operational and safety concerns (risk of collapse). At the time, we did not prioritise this with our limited asset health budget because the risks created from this asset being out of service were not as significant as other risks (we showed in our submission that we have spent our historical capital maintenance allowances in full[16]). That is, this was not a reassessment of treatment requirements or a decision that the asset was no longer needed.

83. While the site continues to operate with a reduced number of available PSTs, this does not mean that the unavailable assets are no longer relevant to the operation of the works. Reduced PST availability has resulted in a more constrained operating position, with fewer options to manage maintenance activities, asset outages and process risks. Operational evidence indicates that two PSTs are required to achieve Full Flow to Treatment because of hydraulic constraints within the existing configuration, and that a third tank would reduce the risk of compliance failures.

84. Washington WWTW is not a lightly loaded or low-risk site. The available PST stage is also operating close to recognised process limits: retention time at Full Flow to Treatment is currently approximately 1.8 hours, which is below the limit of our own internal design guidance (2hrs) to ensure asset resilience, and some PSTs are approaching design loading limits during normal operation. The two tanks currently in service at Washington have a capacity of approximately 3,500m3. Based on desktop capacity assessments, bringing a third tank into service would increase retention time at Full Flow to Treatment to acceptable levels (4,500m3 would lead to a time of 2.29 hours, 5,000m3 would lead to a time of 2.54 hours), see Figure 7, Figure 8 and Figure 9.

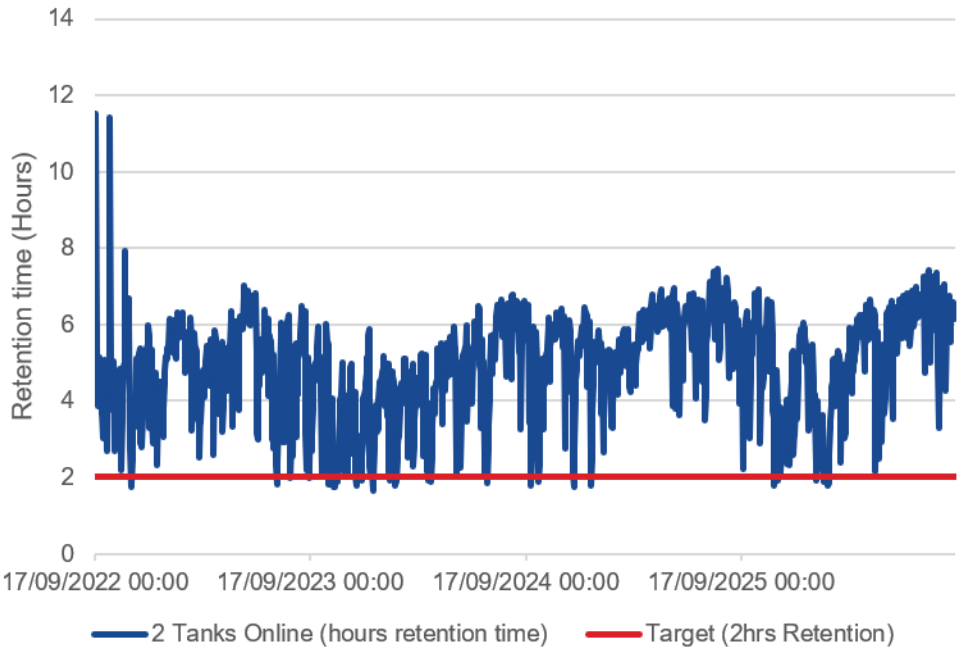
[16] https://www.nwg.co.uk/globalassets/business-plan-2025-30/june26/nes---asset-health-investment-case---civil-assets-at-wastewater-treatment-works.pdf, Figure 3.

FIGURE 7 - RETENTION TIME PERFORMANCE WITH ONE TANK ONLINE



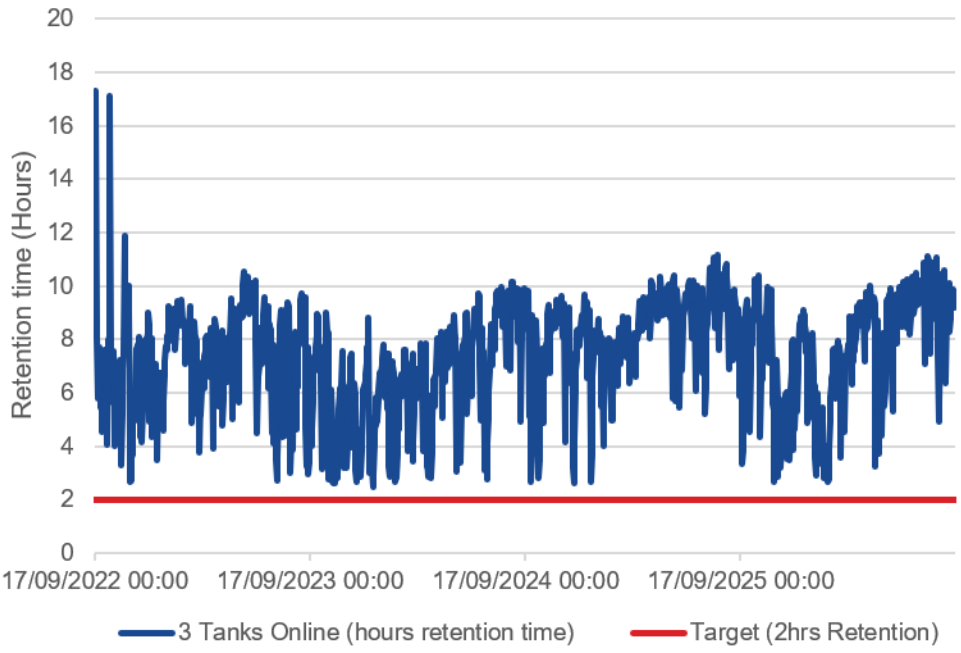
Source: Washington Capacity Assessment and Flow Data

FIGURE 8 - RETENTION TIME PERFORMANCE WITH TWO TANKS ONLINE



Source: Washington Capacity Assessment and Flow Data

FIGURE 9 - RETENTION TIME PERFORMANCE WITH THREE TANKS ONLINE



Source: Washington Capacity Assessment and Flow Data

85. However, if the site were operating on 3 PSTs, we would still be unable to undertake routine maintenance on tanks while maintaining acceptable retention time at Full Flow to Treatment. We consider it best practice to drain down, inspect and maintain tanks twice per year, on rotation (activity which would be essential to prolong good asset health in future). It would not be possible to complete this maintenance schedule while maintaining performance unless we also replace the fourth PST.

86. We also experience rapid deterioration of sludge settlement performance in the PSTs at this site, resulting in a significant increase in sludge accumulation within the tanks. During such events (including as recently as August 2026), sludge inventories have increased substantially over a matter of days. This currently requires extensive operational intervention, including sludge tankering, to maintain control of the process. The restoration of the fourth PST would provide operators with significantly greater flexibility to manage periods of deteriorating sludge settlement performance by distributing this more effectively across more PSTs.

87. During our recent criticality analysis of all wastewater treatment sites (this takes into account; flow, dilution, security, sludge assets and permit requirements), we ranked Washington STW as the tenth most critical site out of a total of 443 sites which we assessed.

88. We will keep this issue under review and consider whether to make a case in our PR29 plan for the asset.

4. ADDITIONAL EVIDENCE REQUESTED ON SPECIFIC PRIORITY ASSETS

89. As part of the DD Ofwat gave a conditional allowance in a number of areas and requested further information to demonstrate the robustness of our case. This section responds to these requests including:

- various information requests in relation to service reservoirs in section 4.1;
- information requests in relation to our CBA approach for both boreholes and wastewater civil assets in section 4.2;
- information requests in relation to Wastewater civils assets in section 4.3; and
- information requests in relation to borehole assets in section 4.4.

4.1. INFORMATION IN RELATION TO OUR SERVICE RESERVOIR INVESTMENT PROPOSALS

90. Ofwat has raised a number of requests for further evidence in relation to our service reservoir investment proposals which we seek to provide in this section including:

- Information in relation to our network storage inspection approach, see section 4.1.1;
- Clarification in relation to the Stoneygate service reservoir, see section 4.1.2;
- Demonstration of the robust and efficient costs of these cases, see section 4.1.3;
- Confirmation that benchmarking/models are bespoke to the replacements, see section 4.1.4; and
- An explanation of the variance in costs between the cost change submission and the CMA process, see section 4.1.5.

4.1.1. Network Storage Inspections

91. Ofwat stated:

> While a (maximum) ten year inspection frequency has long been baseline advice (see for eg UKWIR Good Practice Guidance20), in 2022, the Drinking Water Inspectorate (DWI) shifted to enforce, where the time between asset inspections exceeded 10 years. We consider, this may be a factor, in the company's observation of increasing inspection number requirements. The company is encouraged to outline in its draft determination response, if there are other drivers to increased inspection frequency.

92. Our network storage inspection approach is centred around a technical risk assessment of each tank, this goes beyond the DWI's minimum expectations. Multiple factors are assessed to develop a low, medium or high risk score which drive the 3 or 5 year maximum inspection intervals. This approach predates the DWI's 10 year maximum. Where we have been unable to take tanks out of service for inspections without severe disruptions to customers we have not always been able to meet our inspection needs. At a high level, the inspection risk assessment considers the following factors:

- Number of years since last inspection
- Missing inspection or construction data

- E.coli or coliform fails within last 5 years
- High risk construction materials – Masonry
- Ingress found at last inspection

93. In addition to this, if a tank suffers a regulatory or operational water quality failure, or operational flow cytometry information indicates it may have allowed ingress, immediate isolation and inspection is pursued.

FIGURE 10 – PERCENTAGE OF SR COMPARTMNETS STRUCTURALY INPSPECTED BY YEAR

Calendar Year	Percentage of SR tanks or cells inspected
2010	20%
2011	30%
2012	28%
2013	24%
2014	22%
2015	29%
2016	23%
2017	25%
2018	24%
2019	30%
2020	23%
2021	30%
2022	27%
2023	27%
2024	25%
2025	23%

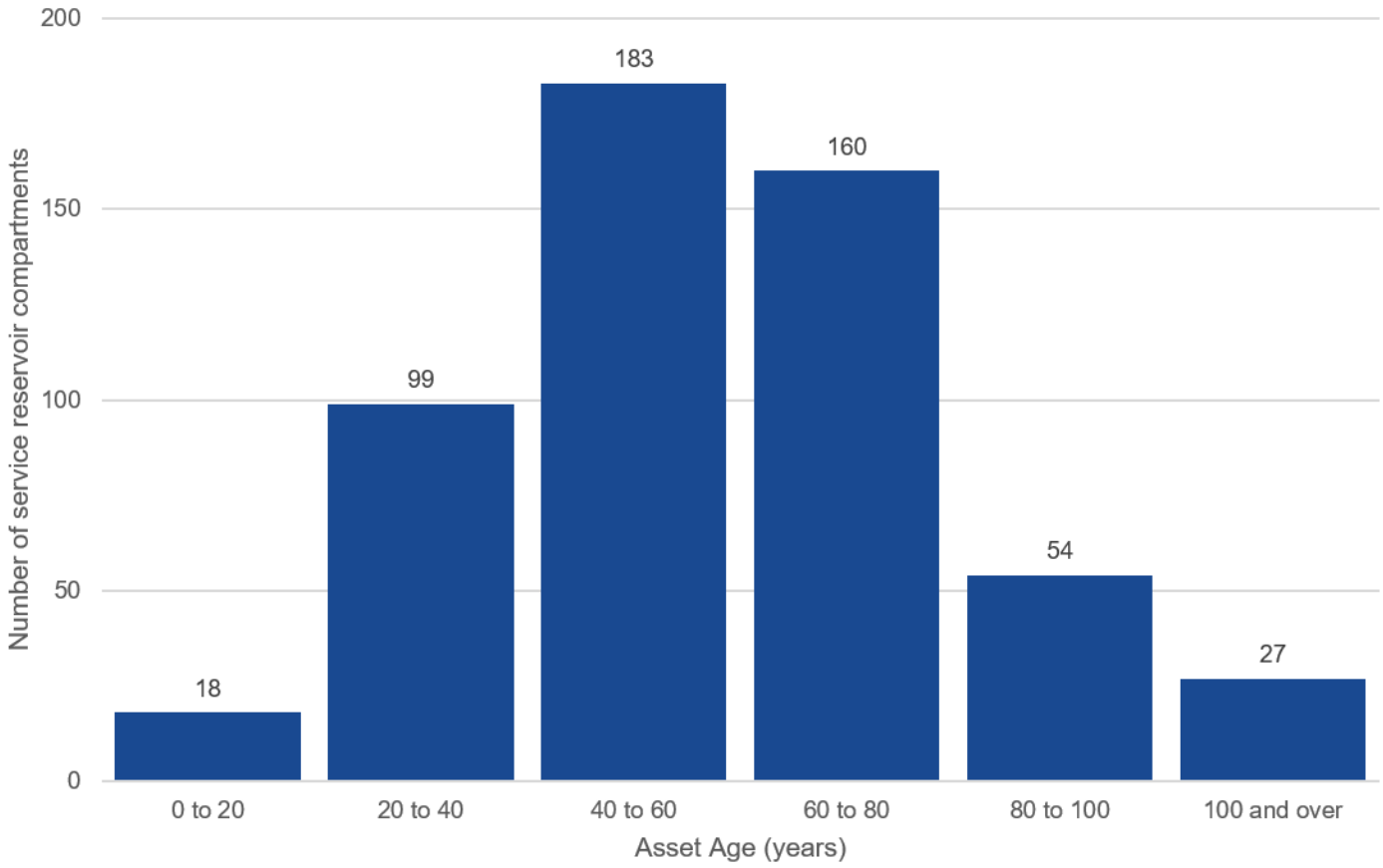
Source: NWL SR base inspections information 2026 with summary working

94. This demonstrates that we have structurally inspected an appropriate proportion of our service reservoirs in the years before the UKWIR guidance (2017) and the DWI changes in 2022. A percentage of 25% represents an average 4 year inspection frequency, across the total number of compartments, demonstrating a blend between the 3 and 5 year maximum inspection frequencies.

95. We included the age profile set out in Figure 11 below within our initial business case at PR24, NES35a[17]. This illustrates the bow wave of aging service reservoirs that will inevitably require more inspection and maintenance to manage their performance as they enter the last quarter of their expected asset lives of about 100 years. The increased need for inspections and interventions is primarily driven by this age profile rather than any other factor.

[17] NES35A – Supplementary Business Case for Service Reservoirs Replacements

FIGURE 11 - AGE PROFILE OF SERVICE RESERVOIR COMPARTMENTS IN 2024

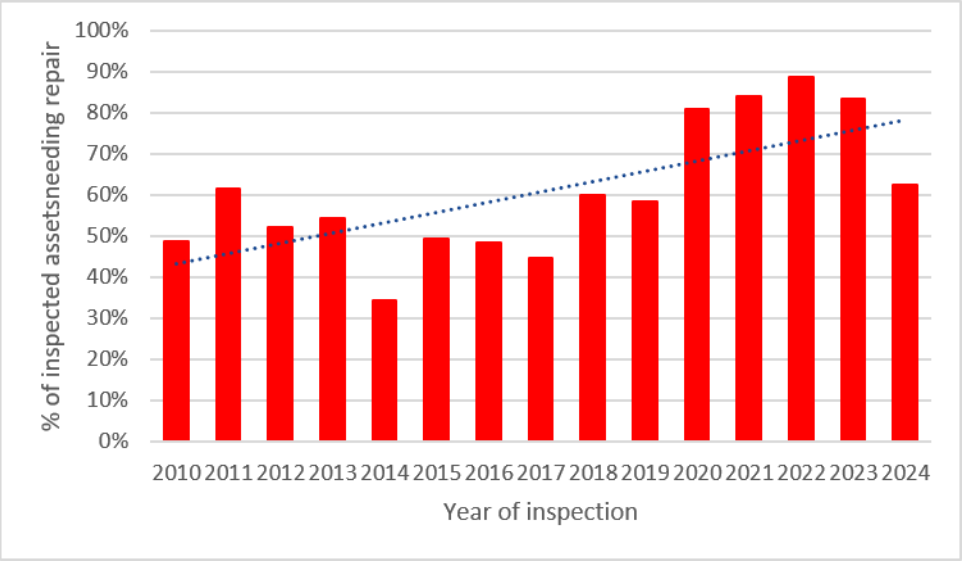


Source : NES35a - supplement business case for service reservoir replacements[18]

96. As our network storage assets age and deteriorate, increasing the risk of more serious structural issues and ingress, we will need to inspect and intervene more and more often. Figure 11 shows the age profile of our service reservoirs, 5% of our service reservoir assets are over 100 years old and a further 10% are between 80 and 100 years old. It is apparent that the next 20 years will see increasing demands on our service reservoir refurbishment programme and an accelerating need to replace some reservoirs as moderate age tanks move into their last quarter of expected life. Our business case also outlines that resultant work from these inspections is more costly for poor condition assets and continues to cost more, year on year.

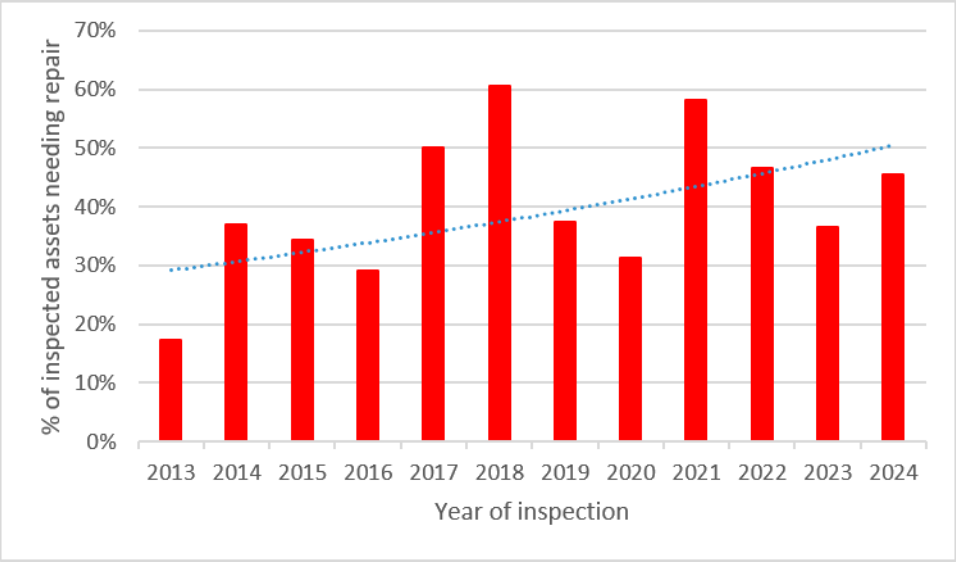
[18] https://www.nwg.co.uk/globalassets/business-plan-2025-30/draft-determination-august-24/nes35a---supplementary-business-case-for-service-reservoir-replacements.pdf, Figure 1.

FIGURE 12 - INCREASING MAINTENANCE REQUIREMENT (NORTHUMBRIAN WATER)



Source: NES35a - supplement business case for service reservoir replacements[19]

FIGURE 13 - INCREASING MAINTENANCE REQUIREMENT (ESSEX & SUFFOLK)



Source: NES35a - supplement business case for service reservoir replacements [20]

[19] https://www.nwg.co.uk/globalassets/business-plan-2025-30/draft-determination-august-24/nes35a---supplementary-business-case-for-service-reservoir-replacements.pdf, Figure 7.
[20] https://www.nwg.co.uk/globalassets/business-plan-2025-30/draft-determination-august-24/nes35a---supplementary-business-case-for-service-reservoir-replacements.pdf, Figure 8.

4.1.2. Stoneygate clarification

97. Ofwat said that it is unclear whether the Stoneygate service reservoir is out of service:

> At Stoneygate, it is unclear whether the asset it is out of service, with the company stating "an older structure collapsed in 2006 and now the refurbishment needs for Stone(y)gate No2 cannot be met without a new structure on site". However, the query response indicated the asset was still in operation, indicating that the new reservoir was a replacement for Stoneygate No2 (as opposed to Stoneygate No2 being refurbished, and the replacement being for Stoneygate (No1)). The assurance report on deliverability states that the Stoneygate SR option represents a 'New 22 Ml service reservoir to be constructed at Stoneygate SR to restore Stoneygate No.1 which was abandoned'. These apparent contradictions do not change our draft decision, but we require the company to provide clarification in its response to the draft determination, over which activities are planned at which asset at this site, now and in future.[21]

98. The Stoneygate site had two tanks, Stoneygate No.1 and No.2. At present:

- Stoneygate No.1 with capacity 14.6Ml has been abandoned since 2006. This was due to sudden ground movement affecting the tank's structural integrity, as the site is built on a geological fault line. The tank was found to be beyond economic repair shortly afterwards.
- Stoneygate No.2 remains in use but has experienced sudden, severe leakage since April 2024, with two of the three 6" underdrains currently running at half their capacity, normally they would be expected to be dry except for periods after high rainfall. This asset continues to perform a key network role and is currently inoperable for inspection and maintenance.

99. We intend to build a third tank at a total of 22Ml, it will have two compartments, 11Ml each. This will enable the service reservoir to be fully 'operable', which means that we can take one of the compartments out of service for inspections and maintenance without causing widespread interruptions to supply. This would then allow us to begin inspections and potential refurbishment actions on Stoneygate No.2, which we have been unable to do in the current configuration.

100. It is this use of the term 'operable' which we think has caused confusion. In our query response, we used the term 'inoperable' for Stoneygate. This is a DWI term meaning that an asset cannot be removed from supply for full inspection and/or maintenance (as described above). This does not mean that the asset is out of service. It indicates that we cannot operate it as intended with the capability to inspect and maintain it without significant disruption to service. We hope this clarifies the misunderstanding and would be happy to provide Ofwat with any further information or discussion it requires on this point.

[21] https://consult.ofwat.gov.uk/consultations/cost-change-2026-draft-determinations/user_uploads/cost-change-draft-determination-2026---northumbrian-water_redacted.pdf page 13

4.1.3. Demonstration of robust and efficient costs

101. Ofwat requested confirmation that all site-specific information has been considered in costings (such as where land purchase is and is not required). There was concern that a "general yardstick approach" had been taken, and that more site-specific information may be available than had been accounted for. In this section, we outline how site-specific information was considered in costings to provide clarity on our robust and efficient costing process.

102. Land purchase costs were originally included for each of the four schemes at a total of £761,290. These costs were included under the Project Overheads category in Figure 14. However, due to pre-existing land ownership at 3 of the 4 sites, land purchase costs are only necessary for Blakelaw Road. Land purchase costs at Auton Stile, Ryhope, and Stoneygate totalling £596,633 were included in error. Only £164,657 is required for land purchase, which will address the situation at Blakelaw Road. The situation at each site is further explained below under section 4.1.3.3.

103. We believe our estimates go beyond a "general yardstick approach". We also requested Turner and Townsend (T&T) examine this challenge to our estimates. In their reply, they set out three levels of estimates that could be developed for these projects. Level 1 – which can be thought of as asset or process level costing and characterize by a cost per volume of network storage. We regard this as a general yardstick approach. Level 2 - Component or elemental costing, is how we would describe the estimates in the business case. The final levels of estimates are those that can be completed after detailed design has taken place and are referred to as "detailed resource-based costing". The estimates used in this business case are Level 2 estimates and comply with our internal processes for a scheme of this maturity. In addition, T&T's response supports them as being appropriate for service reservoir projects at this point in their lifecycle.[22]

104. The proposed costs in our asset health submission vary significantly between the four sites, as outlined in Figure 14. The Direct Costs (Scope' and 'Scope Misc') category includes costs generally associated with the construction of a service reservoir, including pipework, access covers, and chambers. These costs were assessed based on each scheme's requirements, largely dictated by factors including the size and characteristics of the site.

105. Risk and estimating uncertainty (EU) were added based on fixed percentages consistent with our costing methodology (10% for risk and 30% for uncertainty) and are therefore not site specific at this stage. The T&T benchmarking report found these to be 'in line with industry standards at this stage of the project lifecycle'[23].

FIGURE 14 - SERVICE RESERVOIR COSTS (£, 2022/23 PRICES)

	Auton Stile	Blakelaw Road	Ryhope	Stoneygate
Direct Costs (Scope)	5,659,348	2,142,066	8,917,979	10,154,650
Direct Costs (Scope - Misc.)	282,161	150,306	2,181,206	1,501,019
Contract Overheads	3,564,905	1,375,423	6,659,511	6,993,401

[22] NES-CCP-DDR-02 - T&T letter – NWL Asset Health Reopner. We provide this alongside our response.
[23] Appendix 1 - NWL Asset Health Benchmarking report, page 8.

	Auton Stile	Blakelaw Road	Ryhope	Stoneygate
Project Overheads[24]	1,665,458	733,559	3,260,483	3,660,262
Risk & Estimating Uncertainty	4,468,749	1,760,542	8,407,672	8,923,733
CAPEX Total	15,640,621	6,161,896	29,426,851	31,233,065

Source: NWL IMOD costs

4.1.3.1 Site specific costs included within the Direct Costs (Scope) category

106. The direct costs (scope) category is broken down in Figure 15. Several costs are condensed under 'other' for brevity.

FIGURE 15 - BREAKDOWN OF DIRECT COSTS (SCOPE) CATEGORY (£, 2022/23 PRICES)

	Auton Stile	Blakelaw Road	Ryhope	Stoneygate
In-Trench Pipework	188,620	320,820	668,913	1,057,649
RC base slab/RC cover slab	1,352,471	214,223	2,105,103	2,790,318
Membranes and construction fabric	91,863	18,569	142,200	187,545
Internal Civil Tank Profile	496,967	108,525	707,437	940,399
Drainage	182,491	24,985	287,640	382,361
Access Roads and Hardstandings	148,362	99,282	314,228	259,592
Landscaping	89,720	28,665	86,786	103,108
Tank Civil Shell	2,440,093	778,475	3,180,956	3,754,885
Pumps and associated			457,066	
Valves, Meters, Pipes and Fittings			16,924	
Fencing	27,824	27,824	5,838	38,512
Excavation and Earthworks			314,663	
Other	640,937	520,698	630,227	640,281
Total	5,659,348	2,142,066	8,917,979	10,154,650

Source: NWL IMOD costs

107. It is evident that site-specific information has been considered, as the direct costs (scope) vary significantly between sites. These range from £2.142m for Ryhope to £10.154m for Stoneygate. Direct cost (scope) estimates were conducted by our strategic technical partner (Jacobs) and are based on site sketches. These estimates are therefore based on site-specific factors including dimensions, geography, and construction requirements.

108. Several categories show significant variance, depending on these site-specific factors. Cost estimates for in-trench pipework range from roughly £188k to £1.057m. RC base slab/RC cover slab cost estimates vary from roughly £214k to £2.79m. Cost estimates for tank civil shell range from roughly £778k to £3.754m.

109. Figure 15 also contains costs for pumps and valves, meters, pipes, and fittings, and excavation and earthworks at Ryhope. These costs are not estimated for the other three schemes as they are not required. This serves as evidence that the specific scheme and construction requirements at each site have been considered when estimating direct costs (scope).

[24] This reflects the change in cost of land purchase cost

4.1.3.2 Site specific costs included within the Direct Costs (Scope - Misc.) category

110. The Direct Costs (Scope – Misc.) are broken down in Figure 16. It is evident that most costs, including demolition, under pressure tapping into live mains supplying customers, and ground stabilisation, have been considered individually per site as they vary significantly. These costs were developed using the iMod costing database tool of similar projects based on factors such as the size and volume of the existing reservoirs.

111. Power upgrade is assumed at a standard rate per site as electric supply is necessary for service reservoir level and flow monitoring. Existing supply is unlikely to be sufficient to accommodate an additional asset on a new footprint. The schemes in question have not currently been designed in detail to exclude a power upgrade, so standard costs have been included in this area.

FIGURE 16 - BREAKDOWN OF DIRECT COSTS (SCOPE - MISC.) CATEGORY (£, 2022/23 PRICES)

	Auton Stile	Blakelaw Road	Ryhope	Stoneygate
Demolition	179,500	50,000		361,498
Under Pressure Tapping (UPT)	17,661	15,306		
Power upgrade	85,000	85,000	85,000	
Sheet piling			852,824	
Ground Stabilisation			455,808	1,139,521
Retaining wall			238,866	
Double handling			466,704	
Connection onto existing live mains			15,000	
Decommission existing SR			50,000	
Site clearance			17,004	
Total	282,161	150,306	2,181,206	1,501,019

Source: NWL IMOD costs

112. The costs and scope of items vary significantly, showing that the requirements of each site have been considered.

4.1.3.3 Land Purchase (Project Overheads)

113. Bespoke land purchase costs were included for each of the four schemes at a total of £761,290, as is broken down in Figure 17. However, due to pre-existing land ownership at 3 of the 4 sites, land purchase is only actually required at Blakelaw Road. Land purchase costs at Auton Stile, Ryhope, and Stoneygate were included in error. To clarify the situation:

- **Auton Stile**: We own a plot of land to the east of the existing asset. This is the proposed site for the new tank.
- **Blakelaw Road**: The existing site is abandoned, with two tanks out of service. The site is located within a crowded urban area and will not sustain a construction site. Land purchase is required and several nearby sites have been considered.
- **Ryhope:** The scheme proposes to build a new asset on land we own at the Dalton WTW site.

- **Stoneygate**: We own a field to the south of existing site. This is the proposed site for the construction of a new tank.

114. Therefore, we remove £596,633 of the funding previously sought for land purchase from our request as it was included in error. Funding for land purchase at Blakelaw Road (£164,657) is still required.

FIGURE 17 - LAND PURCHASE COSTS (PROJECT OVERHEADS) (£, 2022/23 PRICES)

	Auton Stile	Blakelaw Road	Ryhope	Stoneygate	Total
Initial submission	235,825	164,657	291,256	69,552	761,290
Revised at DD	0	164,657	0	0	164,657

Source: NWL IMOD costs

4.1.3.4 Surveys

115. Ofwat highlighted that most models appear to contain survey costs associated with land purchase. It is correct that each site was given a bespoke survey (contract) cost, and these are listed in Figure 18. However, survey costs are not necessarily related to land purchase. Surveys may be required before construction of additional assets at existing sites due to environmental, geological, or asbestos concerns. These costs are therefore not discounted simply because land purchase is not required. For further clarity on our assumptions:

- **Auton Stile:** There is potential for ground movement at the site, which can affect the structural integrity of the tanks. The existing plot should be geologically examined before a new structure is built. The field surrounding the site should also be surveyed in case pre-existing structures on site obscure any geological issues.
- **Blakelaw Road**: Land purchase is required. Appropriate investigation and survey will be required before construction begins.
- **Ryhope:** The scheme proposes to build a new asset on our land at the Dalton WTW site. This will require investigation before construction begins.
- **Stoneygate:** The site is located on a geological fault line. Associated ground movement has previously affected the existing assets. In 2006, geophysical studies illustrated that the faultline may bisect the field in which we intend to build the new tank. Before detailed designs are produced, geological surveys should be conducted to confirm whether construction at the site is appropriate.

FIGURE 18 - SURVEY COSTS (£, 2022/23 PRICES)

	Auton Stile	Blakelaw Road	Ryhope	Stoneygate
Survey	25,454	13,692	37,225	37,654

Source: NWL IMOD costs

4.1.3.5 Security

116. Bespoke security costs are provided for each site, as is evidenced in Figure 19. These are based on each scheme's scope and cover the provision of site security during the construction of new assets. Each figure accounts for scheme-specific factors such as the site size and the length of time required for construction.

FIGURE 19 - SECURITY COSTS (£, 2022/23 PRICES)

	Auton Stile	Blakelaw Road	Ryhope	Stoneygate
Security	108,654	46,627	185,805	192,426

Source: NWL IMOD costs

4.1.3.6 Access

117. A standard cost for new access roads/hardstandings has been included for each scheme, as is evidenced in Figure 20.

118. This is standard specification for SRs to allow for maintenance and frequent water quality sampling. Costs have therefore been included on a standardized basis as the exact design has not yet been finalised.

FIGURE 20 - ACCESS COSTS (£, 2022/23 PRICES)

	Auton Stile	Blakelaw Road	Ryhope	Stoneygate
Access Road/Hardstandings	64,631	64,631	64,631	64,631

Source: NWL IMOD costs

4.1.3.7 Other

119. Finally, other bespoke costs are listed in Figure 21. The significant variation in costs across sites demonstrates that costs are specific to the requirements of each scheme. The costs are developed from the iMod costing tool based on each scheme's scope. Each figure accounts for site-specific factors such as the size of the plot and the length of time required for construction.

120. Fencing (scope) costs cover permanent fixtures left behind on-site after construction is completed. Fencing and lighting and compound (contract overheads) account for temporary facilities to enable construction.

FIGURE 21 - OTHER COSTS (£, 2022/23 PRICES)

	Auton Stile	Blakelaw Road	Ryhope	Stoneygate
Fencing (scope)	27,824	27,824	5,838	38,512
Fencing & lighting (contract overheads)	20,441	9,763	32,457	33,240
Compound (contract overheads)	221,494	80,900	422,412	444,664

Source: NWL IMOD costs

4.1.3.8 Clarification on deliverability

121. Ofwat also requested clarification on cost discrepancies between third-party deliverability reports, completed for the first proposal of the service reservoirs as part of PR24, and the costed solution presented in the iMod report (e.g. at Stoneygate) as part of our cost change submission.

122. At PR24, a service reservoir investment deliverability review was conducted on our behalf by Aqua Consultants. Aqua's review aimed to provide an independent assessment of the feasibility and risks associated with service reservoir investments, rather than a detailed cost projection. The deliverability assessment for Stoneygate was derived from a strategic-level review undertaken by Wood Group PLC in 2022 and therefore relied on several generic assumptions, including that site access, security, and electrical supply were already adequate.

123. Consequently, those original cost estimates were not developed using a detailed site-specific appraisal. In contrast, the costed solutions presented in the iMod report have been developed using a more detailed, site-specific methodology. This includes identification of additional requirements, such as a 30m access track extension at Stoneygate, with standard costs applied where work is required. The updated estimates therefore provide a more accurate representation of anticipated delivery costs and should be relied on instead of earlier third-party deliverability assessments which made several generic assumptions.

4.1.4. Confirmation that models/benchmarking are bespoke to replacement

124. Ofwat asked for clarity that the models and benchmarking were bespoke to replacement. We confirm that this is the case and provide further details below.

125. Cost benchmarking was conducted by Turner & Townsend (T&T) on our behalf. T&T have confirmed that the costing models were developed specifically for service reservoir replacement schemes and do not assume that replacement costs are equivalent to those of constructing a new asset.[25]

126. The replacement cost estimates include the activities required to remove and replace an existing asset at an operational site, including construction of the replacement asset and subsequent demolition/decommissioning of the existing reservoir. Consequently, the scope of work differs from that of a standalone newly built reservoir, which typically includes only the construction of the new asset.

127. Benchmarking was therefore undertaken against comparable replacement scopes, ensuring that costs reflect the additional activities associated with replacing an existing operational asset rather than assuming equivalence with a newly built scheme.

128. It should also be noted that the proposed replacement strategy at Auton Stile, Ryhope and Stoneygate requires the construction of a new reservoir while the existing reservoir remains operational. As these are single-tank assets

[25] NES-CCP-DDR-02 - T&T letter – NWL Asset Health Reopener. We provide this alongside our response.

providing critical network functions, replacement on the existing footprint is not feasible without interrupting service. The replacement work therefore involves constructing a new operational asset in parallel with the existing asset before its eventual decommissioning.

129. In comparison, Blakelaw Road is the only site where the service reservoir is currently out of service. However, replacement on the existing footprint is impractical due to site size and construction site access constraints. Demolition of the old asset will still be required to make the site safe. As a result, this scheme is still unable to realise the full cost efficiencies that may typically be associated with straightforward replacement on an existing asset footprint, despite being classed as replacement schemes.

4.1.5. Changes in parameters that have driven cost increases since our CMA representations

130. Ofwat noted that cost changes between the CMA representation and the asset health submission were due to parameter changes in costing models. However, Ofwat sought greater certainty by requesting further information on the parameter changes that drove these cost increases.

131. We asked T&T to look at this issue, and they confirmed that several factors have caused cost increases since the CMA representation. Generally, costings increased because the original models were based on generic concrete storage tanks. These are more appropriate for smaller volume process tanks rather than the specific, larger storage tanks required. We outlined this in Paragraph 178 of our Asset Health Investment Case for Service Reservoirs and Water Towers, where we discussed why the cost curves used for the earlier costings were not appropriate:

- The cost curve for the roof was based on data for much smaller structures whereas these service reservoirs we will be delivering are five to eight times the size.
- There is a similar instance for the cost curve for the walls of the structure where one of the service reservoirs is significantly outside of the range of the projects included to fit the cost curve
- The cost curve for the floor is based on data for much more general structures where for example data for above ground steel tanks are informing the costs when they are clearly not applicable in this instance.
- Overall, the scope of works was based on a pre-cast sectional design which is not feasible for a service reservoir and the ground conditions within which it must operate

132. Key cost increases are broken down in Figure 22. Several smaller cost increases are condensed under ‘other’ for brevity.

FIGURE 22 - CHANGES IN DIRECT COSTS (SCOPE) SINCE CMA REPRESENTATION

	Auton Stile	Blakelaw Road	Ryhope	Stoneygate	Total increase (across all sites)	As a percentage of total change
Reinforced Concrete Cover Slab	749,235	196,041	1,179,983	1,568,011	3,693,270	61.22%
Internal Civil Tank Profile	146,967	108,525	413,921	351,332	1,020,745	16.92%
Tank Civil Shell	209,198	778,475	-31,396	-280,488	675,789	11.20%
Excavation and Earthworks			314,663		314,663	5.22%
Pumps Duty			75,831		75,831	1.26%
Pumps Standby			75,831		75,831	1.26%
Other	-48,906	173,676	25,671	26,675	177,116	2.92%
Total	1,056,494	1,256,716	2,054,503	1,665,531	6,033,244	100%

Source: NWL analysis of the changes in IMOD costs

133. Three primary cost change drivers were identified by T&T:

- Reinforced concrete cover slab. This accounts for 61.22% of the overall cost change detailed in Figure 22.
- Reinforced concrete internal profile and civil tank shell, the walls and floor. This accounts for 28.12% of the overall cost change detailed in Figure 22.
- Pumps. The previous model underestimated market prices for pump supply and installation at a proposed name plate rating of 110kw. T&T highlighted a substantial increase in pump purchase and install costs from about £21k at CMA to about £96k in this application, their internal analysis of 130 other schemes support this. The model was updated to reflect this, as pump installation is required for the Ryhope scheme. This accounts for 2.52% of the overall cost change detailed in Figure 22.

134. Taken together, the three cost drivers highlighted by T&T account for 91.86% of the overall cost change since our CMA representation.

135. A further 5.22% is accounted for by Ryhope's excavation and earthworks costs, which reflect additional construction requirements and constraints at the proposed site at Dalton WTW. These additional requirements were highlighted by the strategic technical partner's (Jacobs) scope checks in February 2026 and therefore were not known at the time of our CMA submission.

136. The remaining 2.92% of cost changes were driven by various categories including civil assets, mechanical assets, and electrical/control assets. These are explained by fluctuations in market prices which are not unusual.

137. It should be noted that there have been several cost decreases since the CMA representation. The sub-total figures in Figure 22 account for both cost increases and decreases. An example of one more significant decrease is a reduction in roof drainage. The roof of these tanks will be benched to drain naturally and covered with loose stone, with no structured drainage required. The overall change in direct costs between the CMA representation and our asset health estimates is £6.03m or just 7% of the total cost.

138. Further cost changes occurred due to risk and estimating uncertainty. We typically apply a standard rate to the direct costs. This means that if the direct costs increase, the risk and estimating uncertainty costs increase proportionately.

139. T&T benchmarking process identified that risk and estimating uncertainty had been understated in the original CMA representation. Both had been applied only to construction costs rather than total direct costs and estimating uncertainty had been set at 20% rather than the standard 30% for enhancement schemes at this stage. Correcting these assumptions further increased the overall cost estimates. T&T benchmarking supported these revised indirect costs (Risk and EU) within the asset health business case.

4.1.6. Service reservoirs conclusion

140. We maintain that the funding we originally requested for service reservoir asset health improvements in our Asset Health Investment Case 2026 is necessary. Turner and Townsend (T&T) independent benchmarking[26] confirms that our submission lies within the expected range for observed costs for comparable projects delivered by industry peers. We accept that land purchase costs were included in error at three sites. We therefore withdraw the funding originally requested for land purchase at Auton Stile, Ryhope, and Stoneygate while retaining the funding originally requested for land purchase at Blakelaw Road. This results in an overall reduction of £596,633.

4.2. ADDITIONAL EVIDENCE: COST-BENEFIT ANALYSIS AND OPTION ASSESSMENT TO SUPPORT OUR CASE

141. In its draft determination, Ofwat raised related concerns about the cost-benefit analysis and option assessment supporting our borehole and wastewater civils cases. For boreholes, Ofwat requested stronger evidence of the benefits included in the CBA and the alternative intervention strategies considered. For trickling filters and settlement tanks, Ofwat requested stronger evidence that we had considered a sufficient range of options, selected the best option for customers and appropriately justified the rejection of repair options in relevant cases.

142. To address these concerns, we carried out further work across both asset classes using a common assessment framework and approach. We used our Copperleaf decision support tool to compare preferred and alternative interventions against a counterfactual of continued asset deterioration. We also reviewed the economic results

[26] Appendix 1- NWL Asset Health Benchmarking Report.pdf, page 8 (submitted in May 2026).

alongside asset-specific condition, engineering and operational evidence. This provides a consistent basis for demonstrating why each proposed intervention represents the best available option for customers.

143. Our original assessments focused primarily on the service performance of the proposed interventions relative to current performance. While this supported comparison of service risks, it did not fully capture the wider financial and operational consequences of allowing an asset to deteriorate and fail. The further assessment therefore considers intervention costs, future capital and maintenance requirements, service performance, operational resilience, environmental and compliance risks, and the avoidable costs of asset failure. This provides a whole-life comparison rather than one based only on initial capital cost or historic service performance.

144. The timing and likelihood of failure are informed by asset condition assessments and deterioration modelling. Model outputs are reviewed against observed condition and operational evidence and are re-baselined where inspections show that deterioration is occurring more rapidly than initially forecast. This ensures that the economic assessment reflects the best available evidence of current condition and expected future performance.

145. For each option, the net present value (NPV) compares the forecast costs and benefits after intervention with the counterfactual position. The resulting NPV and benefit-cost ratio provide a consistent starting point for comparing options, but they are decision-support tools rather than deterministic selection rules. Final decisions also consider the nature and recurrence of defects, residual asset life, technical feasibility, safety, constructability, operational performance and confidence in delivery. Where economic outcomes are close, greater weight is placed on engineering evidence and the option's ability to deliver a durable outcome.

146. The same overall framework has been applied to the borehole and wastewater civils assessments. The following sections explain the asset-specific assumptions, evidence and results for each case.

4.2.1. Boreholes: updated optioneering and CBA assessment

147. For boreholes, the principal asset-specific issue is that these are long-life assets whose deterioration may not materially affect service until a significant outage or failure occurs. The counterfactual therefore combines the probability of failure over time with the consequences of that failure, including supply interruption, tankering and incident-management costs.

148. We used the borehole deterioration curve developed for the cost change submission, including the assumption that there is a 50% probability of failure at 65 years, to estimate how failure risk changes with age (see Figure 23). Failure is defined as collapse or a significant long-term outage. The model does not predict the precise failure date of an individual borehole; it provides a consistent basis for comparing the expected value of alternative interventions.

149. The borehole assessment also reflects the different expected lives of the options. Relining is assumed to provide up to five years of additional life, with a maximum of two refurbishment interventions before a new source is required. Acidisation is assumed to be repeated at five-year intervals until the borehole reaches 65 years. These assumptions

allow the assessment to compare short-life refurbishment with replacement or additional-source options on a consistent whole-life basis.

FIGURE 23 - BOREHOLE AGE AND FAILURE CURVE

Borehole age	% of failure
0	0
35	10
45	20
50	30
55	40
65	50
75	60
85	70
100	80
120	90

Source: NWL borehole survival model

150. In the event of a long-term outage, we incorporated the operational incident costs into the model as a "cost avoidance" benefit. This operational expenditure includes tankering costs and monthly incident management costs. We estimated this from the actual monthly drought management costs seen across the Northern region in 2025 and Essex & Suffolk region in 2026 (reduced by 50% to scale this to a single area within one region; that is, either Essex or Suffolk; or Berwick or Kielder WRZ). A long-term borehole outage would require a similar level of hyper care across treatment and network sites. We have excluded incident management costs from projects within the Kielder WRZ (this only applies to Fulwell) due to headroom being less of a concern. Tankering costs have been incorporated for peak week demand only.

151. Tankering costs have been capped at £30,000 per day, based on the maximum feasible deployment of 12 tankers per day. Figure 24 shows the volume supplied and associated costs achieved by tankering up to this ceiling.

FIGURE 24 - TANKERING COSTS AGAINST WATER DEMAND

L/s	ML/day	Tankers/day	Cost/day
2	0.1728	6	£15,000
3	0.2592	9	£22,500
4	0.3456	12	£30,000

Source: NWL Alternative Water Supplies Contractor

152. The resulting assessment captures the customer value of avoiding asset failure, supply outages, reactive expenditure and repeated short-life interventions. Figure 25 presents the NPV and benefit-cost results for the preferred and alternative borehole options. The supporting summaries explain where engineering or operational constraints mean that the highest modelled value cannot be considered in isolation.

FIGURE 25 - CBA FOR BOREHOLE PREFERRED AND ALTERNATIVE OPTIONS

Site	Option	Action	NPV (30 yrs) (£m)	Summary
Syleham Crag	**Preferred (commenced)**	**Drill Replacement offsite Crag No 2 Borehole on land bordering Syleham TWS.**	**33.7**	The NPV assessment demonstrates that the preferred option achieves an NPV of £33.7m. Contrastingly, the alternative option provides negative economic value. The existing borehole is currently abandoned due to a previous catastrophic lining failure. This means that refurbishment is not a viable option, and the drilling of a replacement borehole has already commenced.
	Alternative	Refurbish borehole – not viable as borehole beyond repair	-0.4	
Holton Valley Farm	**Preferred (commenced)**	**Drill an additional production borehole to produce the full licensed flow into Holton WTW.**	**23.9**	The NPV assessment demonstrates that the preferred option achieves an NPV of £23.9m. This contrasts with the alternative option, which provides negative economic value. Refurbishment is not viable as the boreholes cannot be taken out of supply due to year-round demand. There is also a risk of total collapse which refurbishment would not fully address. Drilling a replacement borehole is preferred so we can take advantage of the full licensed flow into Holton WTW, increasing raw water resilience and reducing the risk of supply loss.
	Alternative	Refurbish borehole – not viable as cannot take borehole out of supply for refurbishment	-0.4	
Mendlesham Works	**Preferred**	**Drill new standby borehole**	**100.9**	The NPV assessment demonstrates that both options achieve positive NPVs. The preferred option provides strongly positive economic value (£100.9m), while the supplementary option delivers additional value (£16m). The existing borehole is in poor condition and presents a resilience risk as it is a single supply source. Drilling a new borehole will enable us to take the original borehole out of supply for refurbishment while increasing supply resilience. Remediation works are currently on hold pending completion of the preferred option.
	Supplementary	Refurbish borehole pending construction of new standby Borehole	16.0	
Bleach Green	**Preferred**	**Acidise borehole to clean casing and increase flow.**	**-0.5**	The NPV assessment demonstrates that both options fail to provide positive economic value. However, the preferred option delivers a smaller negative NPV than the alternative option (-£0.5m vs. -£3.6m). These negative NPVs are due to the young age of the existing borehole. The analysis model assumes an additional lifespan of 30 years and a low failure rate until then. If this were true, it would be uneconomic to invest now. However, the borehole has degraded more quickly than expected and investment is now required to prevent early failure. The yield of the existing borehole has decreased because it is blocked by mineralised iron. Cleaning the borehole will increase its flow and allow us to more fully take advantage of the abstraction license. This means that drilling a new borehole is not necessary at present.
	Alternative	Drill new borehole and abandon existing borehole	-3.6	
Saxmundham	**Preferred**	**Drill new borehole on site. Abandon existing (unusable) borehole.**	**244.7**	The NPV assessment demonstrates that both options deliver significant economic value. The preferred option delivers significantly more value than the alternative option (£244.7m vs. £40.9m). The existing borehole is deemed unusable due to ingress, pollution risk, and risk of collapse. Water quality concerns make refurbishment nonviable. It is necessary to drill a replacement borehole and abandon the existing one.
	Alternative	Refurbish borehole based on survey results	40.9	
Halesworth	**Preferred**	**Drill new remote borehole**	**75.2**	The NPV assessment demonstrates that the preferred option achieves an NPV of £75.2m. Comparatively, the alternative option provides a negative economic value (-£0.4m). Refurbishment is not a viable option because of significant lining deterioration, which has created a long-term risk of collapse. The preferred option is to abandon the existing borehole and drill a new remote borehole.
	Alternative	Refurbish borehole – not viable as cannot take borehole out of supply for refurbishment	-0.4	

Site	Option	Action	NPV (30 yrs) (£m)	Summary
Waveney Chalk	**Preferred**	**Drill & establish a replacement borehole on site**	**17.3**	The NPV assessment demonstrates that the preferred option achieves a positive NPV while the alternative option is negative. The existing borehole is at risk of total failure due to its poor structural condition. This makes refurbishment nonviable and threatens a critical input to Barsham WTW. Drilling a replacement borehole is preferable to improve the raw water resilience of the supply zone.
	Alternative	Refurbish borehole based on survey results	-0.4	
Puddingmoor	**Preferred**	**Drill additional borehole**	**136.8**	The NPV assessment demonstrates that the preferred option delivers a significantly greater NPV than the alternative option (£136.8m vs. £29.3m). The existing borehole is a single point of critical failure and supplies a significant quantity of raw water to Barsham WTW. Any outage would threaten the supply-demand profile of the site. This means that drilling an additional borehole is preferable to the refurbishment of the existing borehole, which creates the risk of total loss during the repair process.
	Alternative	Refurbish borehole – presents risk of total loss of borehole	29.3	
Barsham Hall	**Preferred**	**Drill additional borehole**	**95.9**	The NPV assessment demonstrates that the preferred option achieves a significantly greater NPV than the alternative option (£95.9m vs. £11.2m). The existing borehole is a single point of critical failure for the Barsham supply zone. Outage would result in a significant reduction of raw water input to Barsham WTW. Drilling an additional borehole is preferred to the refurbishment of the existing borehole, as the former fully addresses the resilience risk.
	Alternative	Refurbish borehole pending construction of new standby borehole	11.2	
Holton	**Preferred**	**Drill additional borehole**	**106.3**	The NPV assessment demonstrates that the preferred option achieves a significantly greater NPV than the alternative option (£106.3m vs. £26.1m). The existing borehole presents a resilience risk as a single point of failure. This means that the borehole cannot be taken out of supply for refurbishment. Refurbishment is also nonviable because it does not fully address the resilience risk and creates a further risk of total loss during the repair process. Drilling an additional borehole is therefore preferred to improve resilience.
	Alternative	Refurbish borehole – not viable as cannot take borehole out of supply for refurbishment	26.1	
Bungay	Preferred	Perform surveys to determine borehole condition	n/a	The NPV assessment demonstrates that the preferred option achieves a significantly greater NPV than the alternative (£192.4m vs. £28.5m). There are two shallow boreholes on site. Both are in poor condition, with water quality and ingress risks. Surveys are required to fully assess the condition of the two boreholes. It is necessary to drill a new borehole to supply the area while these two boreholes are taken out of supply to be surveyed.
	Alternative	Refurbish borehole based on survey results	28.5	
	Preferred	Drill new borehole	**192.4**	
Fowberry Mains A	**Preferred**	**Headworks refurbishment (grout annuals)**	**-0.3**	The NPV assessment demonstrates that both the preferred and alternative option fail to achieve a positive NPV. However, the preferred option delivers a smaller negative NPV than the alternative option (-£0.3m vs. -£3.9m). These negative NPVs are due to the young age of the existing assets. The analysis model assumes an additional lifespan of 30 years and a low failure rate until then. If this were true, it would be uneconomic to invest now. However, the headworks has degraded more quickly than expected and investment is now required. The annulus requires grouting to reduce the risk of contamination. This is preferred to drilling an additional borehole, which is not necessary if successful remediation is carried out at the headworks.
	Alternative	Drill additional borehole	-3.9	
	Preferred	**Drill additional borehole**	**127.9**	

Site	Option	Action	NPV (30 yrs) (£m)	Summary
Fowberry Borehole Treatment 1	Alternative	Refurbish borehole pending construction of new standby borehole	**127.9**	The NPV assessment demonstrates that the preferred and alternative options achieve an equally positive NPV (£127.9m). The existing borehole is encrusted, meaning that it is not possible to survey its condition. This creates a risk of failure and presents a resilience risk. Refurbishment risks causing further damage to the borehole without an appreciable gain in terms of water quality. Drilling an additional borehole, which will replace the existing borehole as primary, is therefore preferable.
Fowberry Mains B	**Preferred**	**Acidise borehole to clean casing and increase flow**	**-0.1**	The NPV assessment demonstrates that both the preferred ar alternative option fail to achieve a positive NPV. However, the preferred option delivers a significantly smaller negative NPV than the alternative option (-£0.1m vs. -£3.9m). These negativ NPVs are due to the young age of the existing borehole. The analysis model assumes an additional lifespan of 30 years and a low failure rate until then. If this were true, it would be uneconomic to invest now. However, the borehole has degraded more quickly than expected and investment is now required. The existing borehole has been out of service due to water quality issues. The preferred option is to acidise the existing borehole to clean its casing and increase its flow. Drilling an additional borehole is therefore unnecessary at present.
	Alternative	**Drill additional borehole**	**-3.9**	
Thornton Bog	**Preferred**	**Refurbish borehole casing to combat high turbidity**	**-0.3**	The NPV assessment demonstrates that both the preferred and alternative option fail to achieve a positive NPV. However, the preferred option delivers a significantly smaller negative NPV than the alternative option. (-£0.3m vs. -£3.5m). These negative NPVs are due to the young age of the existing borehole. The analysis model assumes an additional lifespan of 30 years and a low failure rate until then. If this were true, it would be uneconomic to invest now. However, the borehole has degraded more quickly than expected and investment is now required. The casing of the existing borehole is in poor condition, and high turbidity prevents effective surveys being carried out. The preferred option is to refurbish the casing to reduce turbidity levels, and to then perform surveys to assess the borehole's condition. Drilling an additional borehole would be an excessive intervention without first surveying the existing borehole.
	Supplementary	Perform surveys to assess borehole condition once turbidity is lowered.	n/a	
	Alternative	Drill new additional borehole	-3.5	
Felkington	Preferred (at initial submission)	Refurbish borehole casing to combat high turbidity – no longer viable due to casing condition	-0.3	The NPV assessment indicates that neither option delivers a positive NPV. This outcome is driven by the relatively young age of the existing borehole, with the assessment model assuming a further 30 years of operational life and a low failure rate over that period. Under those assumptions, immediate investment would not be economically justified. However, the borehole has deteriorated significantly faster than anticipated, and intervention is now required. At the time of the original submission, our preferred option was to refurbish the existing Felkington 1 (F1) borehole casing to reduce turbidity and enable a full condition survey to be undertaken. However, subsequent investigations have confirmed that the condition of the casing is significantly worse than expected, making refurbishment unviable. As a result, our preferred option is now to drill a third borehole at the site. The existing Felkington 2 (F2) borehole was developed to supplement supplies from F1 by targeting a different aquifer unit but has not delivered the yield required to replace F1. The proposed Felkington 3 (F3) borehole would instead target the same aquifer unit as F1, with the objective of replacing the deteriorating source.
	Supplementary	Perform surveys to assess borehole condition once turbidity is lowered.	n/a	
	Preferred (as of September 2026)	**Drill new additional borehole**	**-4.6**	
Fulwell	**Preferred**	**Perform surveys to assess borehole condition,**	n/a	The NPV assessment demonstrates that both alternative options achieve a positive NPV. Drilling a new standby

Site	Option	Action	NPV (30 yrs) (£m)	Summary
		contamination, and second shaft access		borehole achieves a significantly greater NPV than refurbishment of the existing borehole (£156.1m vs. £25.3m). Surveys are necessary to assess the existing borehole condition, investigate the cause of potential coliform contamination, and examine the second hidden shaft of an abandoned borehole nearby. Until these surveys are carried out, further intervention may be excessive. The preferred option is to first carry out a full survey. Alternative options may then follow depending on the survey's results.
	Alternative	Drill new standby borehole	**156.1**	
	Alternative	Refurbish borehole based on survey results	**25.3**	
Benhall	Alternative	Clean borehole – not viable as cannot take borehole out of supply for refurbishment	20.2	The NPV assessment demonstrates that the preferred option achieves a significantly greater NPV than the alternative option (£149.6m vs. £20.2m). We would prefer to reline the borehole to reduce the turbidity risk caused by sand ingress. However, we accept Ofwat's challenge that this scheme sits outside the scope of the asset health reopener. As a result, we will not be proceeding with this funding request.
	Preferred	Reline borehole	149.6	
Barsham Shipmeadow	**Preferred**	**Drill additional borehole**	**119.5**	The NPV assessment demonstrates that the preferred option achieves a significantly greater NPV than the alternative option (£119.5m vs. £29.3m). The existing borehole is a single point of critical failure within the Barsham supply zone. Any supply outage would significantly reduce the raw water input to Barsham WTW and threaten the area's supply-demand balance. Drilling an additional borehole is preferred to address this resilience risk. Refurbishment would fail to address this risk and create a further risk of total failure during the repair process.
	Alternative	Refurbish borehole – presents risk of total loss of borehole	29.3	

Source: Output from NWL copperleaf decision support tool

4.2.2. Wastewater Civils: Updated optioneering and CBA assessment

153. For wastewater civil assets, Ofwat accepts the need for additional investment but asks for stronger evidence that we considered a sufficient range of options, selected the best option for customers and justified discounting repair at Barkers Haugh.

154. We applied the common CBA approach to all proposed replacements and selected high-value refurbishments. The option review considered repair, partial refurbishment, full refurbishment and replacement, as applicable, using asset-level evidence on condition, failure mechanism, operational performance, environmental and compliance risk, expected life extension and deliverability.

155. The deterioration model forecasts when assets reach Condition Grade 4 and subsequently fail. These forecasts are checked against inspections and operational evidence. Where observed condition is worse than the initial forecast, the model is recalibrated. At Barkers Haugh, for example, the initial model forecast Condition Grade 4 in 2114, while structural surveys found that the filters were already at Condition Grade 4. Recalibration produced a forecast failure date of 2037.

156. The wastewater civils assessment therefore uses the same economic framework as the borehole assessment, but places particular emphasis on observed structural condition, the durability of repair, environmental and permit

consequences, and uncertainty that can only be resolved through intrusive investigation. The PCD framework protects customers where later investigation supports a lower-cost solution that delivers an equivalent outcome.

4.2.3. Results of the option review

157. Figure 26 summarises the NPV assessment. The results support a differentiated programme rather than a general preference for replacement. For Sadberge, replacement has the highest NPV. For Carlton and Redmarshall, Berwick Hill and Great Ayton, targeted refurbishment or repair provides the best value. At Barkers Haugh, replacement has the highest NPV, although the leading refurbishment options are close and engineering risk is therefore the principal differentiator. At Washington, refurbishment has the higher modelled NPV, but replacement remains preferred because of condition, future loading, process resilience and uncertainty over the durability of refurbishment.

FIGURE 26 - SUMMARY OF NET PRESENT VALUE (NPV) ASSESSMENT FOR REVIEWED REPLACEMENT AND HIGH-VALUE REFURBISHMENT SITES

SITE	ACTION	OPTION	NPV (30 YRS, £M)	SUMMARY
Western Area STW - Grade 4a Civil Defects - Secondary Trickling Filter No.1	Demolition of structure and construction of new trickling filter	Candidate	6.8	The NPV assessment demonstrates that all shortlisted options provide broadly similar economic value, with less than £0.4m separating the highest and lowest NPV. The recommended option achieves a strong positive NPV and is closely aligned with the highest-ranked option, indicating that there is little economic distinction between the leading interventions. Given the small difference in NPV, greater weight has been placed on the engineering assessment, which concluded that the recommended option provides greater confidence in delivering a durable long-term solution and addressing the underlying asset risks.
	Media removed and replaced. Demolition and reconstruction of tank walls	Recommended	7.1	
	Media removed and replaced. Localised restoration to brickwork and coping	Candidate	7.2	
Sadberge STW - Grade 4b Civil Defects - Secondary Trickling Filters	Refurbish Trickling Filters	Candidate	16.5	The recommended replacement option achieves the highest NPV of all options assessed, demonstrating that it provides the greatest whole-life economic value alongside addressing the identified condition defects. The NPV assessment therefore directly supports the recommended intervention as the most efficient long-term solution.
	Partial Refurbish Trickling Filters	Candidate	17.2	
	Partial Refurbish Trickling Filters	Candidate	16.8	
	Replacement Trickling Filters	Recommended	17.3	
Barkers Haugh STW - Grade 4b Civil Defects - Secondary Trickling Filter No.1 and No.2	Replacement of Trickling Filters	Recommended	14.4	The recommended replacement option delivers the highest NPV, although the difference compared with the leading refurbishment option is marginal. This demonstrates that both options provide similar economic value. However, the engineering review identified significant uncertainty regarding the long-term effectiveness of refurbishment due to recurring seal failures and concerns regarding the underlying deterioration mechanism. Consequently, the recommended replacement option was selected as it provides greater confidence in achieving a robust, long-term outcome while also delivering the strongest economic case.
	Increased FF Outcome x2 Refurbish Trickling Filters	Candidate	14.3	
	Increased FF Outcome x2Flush through each of the 4 filters to clear blockages	Candidate	13.9	
	Increased Outcome FF x2 Partial Refurbish Trickling Filters	Candidate	14.4	
Hurbuck Cottages STW - Grade 4b Civil Defects - Primary Settlement Tank	Demolition and reconstruction of PST chamber	Candidate	-0.01	The recommended option is the only intervention to achieve a positive NPV, whilst the alternatives remain negative. Although the economic benefit is relatively modest, the assessment indicates that the selected intervention provides the strongest whole-life value and is therefore supported by both the engineering and economic evidence.
	Demolition and reconstruction of PST chamber	Recommended	0.02	

SITE	ACTION	OPTION	NPV (30 YRS, £M)	SUMMARY
	Demolition and reconstruction of PST chamber	Candidate	-0.01	
Juniper STW - Grade 4a Civil Defects - Primary Settlement Tank	Structure is to be demolished and reconstructed	Candidate	-0.13	All options generate negative NPVs, indicating that the monetised benefits alone do not recover the intervention costs over the assessment period. However, the recommended option achieves the least negative NPV and therefore represents the best economic outcome of the options assessed. The selection was further supported by engineering evidence, which identified the need to mitigate ongoing structural deterioration and maintain operational resilience.
	Assumed that the structure is to be demolished and reconstructed	Recommended	-0.12	
	Further investigation is needed to assess the internal condition of the tank	Candidate	-0.15	
Carlton & Redmarshall STW - Grade 4b Civil Defects - Secondary Trickling Filter No.1, No.2 and No.3	Refurbish Trickling Filters	Candidate	10.5	The recommended partial refurbishment option delivers the highest NPV of all options assessed, demonstrating that a targeted intervention provides greater whole-life value than either a more limited repair or more extensive refurbishment approach. The NPV therefore directly supports the recommended solution.
	Partial Refurbish Trickling Filters	Recommended	11.6	
	Partial Refurbish Trickling Filters	Candidate	11.4	
Berwick Hill STW - Grade 4a Civil Defects - Trickling Filter	Replace / rebuild 25% of the wall	Candidate	1.0	The recommended refurbishment option achieves an NPV significantly higher than the alternative intervention considered. This demonstrates that a targeted repair strategy can address the identified defects whilst avoiding unnecessary capital expenditure. Both the engineering assessment and NPV therefore support the recommended option.
	Break out and replace 0.5m2 of mortar from brick filter wall	Recommended	1.9	
	Do nothing	Candidate	-	
Great Ayton STW - Grade 4b Civil Defects - Secondary Trickling Filter (Northern)	Refurbish Trickling Filters	Candidate	1.2	The recommended option delivers the highest NPV of all options assessed, providing clear evidence that the selected intervention offers the most efficient balance between cost, risk reduction and long-term asset performance.
	Partial Refurbish Trickling Filters	Recommended	1.9	
	Partial Refurbish Trickling Filters	Candidate	1.7	
Tow Law STW - Grade 4a Civil Defects - Secondary Trickling Media Filter No.2	Demolition and reconstruction of new trickling media filter	Candidate	1.0	The recommended option achieves the highest NPV, although its advantage over media replacement alone is relatively small. This indicates that both interventions provide similar economic value. The recommended option was selected because the engineering review concluded that partial wall replacement provides greater confidence in addressing the identified structural defects while maintaining a marginally superior NPV outcome.
	Removal and replacement of media	Candidate	1.5	
	Remove & replace media. Partially remove & replace segmental concrete walls	Recommended	1.5	
Washington STW - Grade 4B Civil Defects - Primary Settlement Tank No.1, No.2, No.3, and No.4	Refurbish PST	Candidate	19.3	The NPV assessment demonstrates that all options provide significant value compared with a do-nothing scenario. Although refurbishment options achieve a higher NPV than replacement, the engineering evidence identified significant concerns regarding asset condition, future AMP8 growth requirements, operational resilience and the ability of refurbishment to provide a durable long-term solution. Given the strategic importance of the site and the need to restore long-term treatment capacity, we consider the recommended replacement option provides the most robust and sustainable outcome despite the lower NPV.
	Refurbish PST	Candidate	19.8	
	New PSTs	Recommended	17.0	

Source: Output from NWL Copperleaf decision support tool

158. The option review supports a differentiated programme rather than a general preference for replacement. Lower-cost repair or refurbishment is preferred where it provides the strongest whole-life value and a durable outcome.

159. A small number of interventions have returned NPVs that are close to, or marginally below, zero. However, this does not indicate that the underlying investment need is absent. For asset health investment, the decision to intervene is

driven by evidenced asset condition and risk, with economic appraisal used to identify the most efficient intervention rather than determine whether intervention is required. In these cases, assets have reached condition grade 4 and intervention is required to manage the associated risk to service, compliance and operational resilience.

160. Economic appraisal provides an important assessment of value for money but does not fully capture all benefits associated with asset health investment. Where deterioration has been identified but uncertainty remains regarding the timing and consequence of future failure, the value of intervention can be understated. This is particularly relevant for smaller wastewater treatment works, where monetised benefits are inherently linked to the population served, despite the requirement to maintain treatment capability, environmental compliance and service resilience remaining unchanged. This compliance driver is not fully reflected in the monetised CBA as it is not an option for us to have non-compliant sites regardless of the cost.

161. The appraisal is also undertaken over a 30-year period and therefore does not capture benefits that accrue beyond the assessment horizon. Asset health interventions are intended to maintain serviceability and reduce risk over the full operational life of the asset, meaning long-term benefits may not be fully reflected in the calculated NPV.

162. A marginally negative NPV therefore does not invalidate the need for intervention where deterioration has been evidenced through condition assessment, operational experience and engineering judgement. Rather, it reflects the limitations of quantifying the full value of maintaining critical wastewater assets and avoiding future deterioration and failure.

4.3. WASTEWATER CIVIL ASSET INVESTMENT EVIDENCE

163. This final section of this chapter provides additional evidence in relation to the wastewater civils assets cases including:

- Evidence in relation to Barkers Haugh, see section 4.3.1;
- Evidence in relation to WW Civils enabling costs and options including at Embelton, see section 4.3.2;
- Embelton options and enabling works, see sections 4.3.2.1 and 4.3.2.2;

4.3.1. Barkers Haugh (Deep Dive)

164. Ofwat notes that Secondary Trickling Filters 1 and 2 are approximately 23 years old and asks why repair of the cracking and leakage has been discounted. The relevant issue is not asset age alone, but whether repair can address the failure mechanism, provide a reliable life extension and represent the best whole-life option.

165. Independent inspections classify both filters as Condition Grade 4b. Leakage occurs at multiple wall-to-base interfaces on both structures, and historical records show recurring bottom-seal failures and leakage of treated effluent to land. The common location and recurrence of the defects indicate a potential common-mode issue rather than isolated seal deterioration.

166. The operational significance of these defects is further evidenced by an investment need raised by operational staff following active leakage from the filter structures. The investment record identifies failure of the bottom seals, resulting in treated effluent leaking to land and creating a potential environmental compliance risk. This demonstrates that the deterioration identified through inspections has translated into a tangible operational consequence and is not limited to an assessment of asset condition alone. The requirement for intervention therefore reflects both the observed structural deterioration and the increasing risk of continued leakage and associated environmental impacts if the underlying failure mechanism is not addressed.

167. As-built drawings show that the affected interface contains embedded hydrophilic waterstops, levelling gaps and mass-concrete infill, and that the structures are pile-founded. This does not prove foundation failure, but it shows that the defect occurs within a complex structural interface that may be affected by differential movement, construction tolerances or deterioration of inaccessible jointing components.

168. A surface repair could potentially reduce visible leakage but would not address the underlying structural mechanisms that have likely caused the defect. As such, there is a material risk that deterioration would continue and that future intervention would be required.

169. More importantly, access to and reconstruction of the affected elements would necessitate significant civil engineering works, including intrusive excavation and structural rebuilding. Consequently, an intervention initially characterised as refurbishment increasingly becomes the partial reconstruction of critical structural components, reducing the distinction between refurbishment and replacement in both scope and cost while retaining greater delivery and asset performance risk.

170. Repair has not been rejected simply because replacement offers a longer life. It has been discounted as the preferred solution because the current evidence does not show that it would:

- address the underlying failure mechanism across both filters;
- eliminate the risk of recurring leakage at embedded interfaces;
- provide a sufficiently certain and warrantable life extension;
- maintain environmental compliance without repeated intervention; or
- deliver better whole-life value once recurrence and residual risk are considered.

171. A durable refurbishment could require opening and reconstructing substantial parts of the wall-to-base interface. This would narrow the cost advantage over replacement while retaining uncertainty over the condition and residual life of the existing structural elements. Replacement removes that uncertainty and provides a defined design life and modern construction standard.

172. The updated CBA is consistent with this conclusion. Replacement produces the highest NPV, approximately £14.41m, compared with approximately £14.36m for the leading refurbishment and partial-refurbishment options. The difference is small, so the CBA does not by itself determine the answer. It does show, however, that refurbishment has no material

economic advantage that would justify accepting the greater uncertainty over recurrence, service life and environmental performance.

173. On the current evidence, replacement therefore provides the best balance of whole-life value and risk. Before final scope is fixed, targeted intrusive investigations will test the failure mechanism and long-term repairability. If those investigations demonstrate that a lower-cost refurbishment can deliver equivalent life, risk reduction and environmental performance, we will adopt that solution and customers will be protected through the PCD reconciliation.

4.3.2. Wastewater Civils enabling costs

174. Ofwat accepts the need for investment and has not applied an efficiency adjustment to the programme costing methodology in its DD. It nevertheless asks for stronger site-specific evidence that enabling works are proportionate, particularly at Embleton, where it questions whether an external repair could avoid temporary treatment and whether the assumed nine-week duration is justified.

175. Enabling works allow civil interventions to be delivered safely while live treatment works continue to meet legal and permit requirements. Their cost is driven by process configuration, available standby capacity, flow management, isolation, cleaning, access, temporary power and the time needed to establish stable treatment. It is therefore not expected to be proportional to the cost of the permanent repair.

4.3.2.1 Embleton: options considered

176. When considering the requirement for enabling works across the programme, we have undertaken structured assessment of the opportunities available to reduce, optimise or eliminate the need for temporary works where practicable. This assessment considers a range of factors, including:

- Whether the proposed repair or replacement activity could be safely delivered without temporary works, and the associated implications for operational resilience, environmental compliance, health and safety, and customer service.
- Whether existing operational, redundant or underutilised process capacity on site could be repurposed to provide temporary treatment or storage during construction activities, thereby reducing intervention costs.
- Whether existing temporary assets and equipment, including HSAF equipment and other deployable treatment solutions, could be utilised as part of the enabling works strategy.

177. This approach ensures that enabling works are only included where they are necessary to maintain safe operations, regulatory compliance and service continuity, and that all reasonable opportunities to minimise expenditure have been considered. In response to Ofwat's specific observations regarding Embleton, further detail is provided in the following section to demonstrate how these principles were applied in practice and why enabling works remain an essential component of the preferred intervention strategy at that site.

178. The proposed scope addresses visible cracking and leakage from a primary settlement tank. Available evidence indicates that water may be migrating through the concrete from the internal face, rather than through a discrete external surface defect. An external patch repair was considered but discounted because it would not provide reliable access to, or treatment of, the apparent leakage path. The tank must therefore be isolated, drained and cleaned so that the internal face can be inspected and a durable repair completed.

179. We also considered whether the asset could remain in service, whether storm storage could be used, and whether primary treatment could be bypassed. These options do not maintain a compliant treatment process for the required period.

FIGURE 27 - EMBLETON ENABLING OPTIONS CONSIDERED

Alternative Enabling Works Options	Comment
Do Nothing	'Do Nothing' options for enabling works were considered for Embleton and all other civils assets in the case. 26 assets included in the case had no enabling costs proposed against them. An external crack repair would have facilitated a 'do nothing' option for enabling works, however this was discounted due to uncertainty around whether water is migrating through the concrete structure, this option was assessed as unsuitable. The site team assessed that Primary treatment cannot be bypassed totally operationally.
Storm Tank Usage	There is no balancing area on site. Storm tanks would not allow enough capacity to facilitate this sort of work (2 hours). Storm tank use notification must be submitted if this is to be used.

Source: Storm Tank data provided by project engineer and site team

180. Embleton has 94m³ of storm storage. At the maximum flow of 13 litres per second, this provides approximately two hours of storage, so it cannot support a multi-week intervention. Primary settlement cannot be bypassed for that period without sending materially higher solids and organic loads to downstream treatment, increasing the risk of process failure and permit non-compliance.

181. Constructing an additional permanent tank was also considered conceptually. It would not remove all enabling requirements: new connections, flow diversion, commissioning and integration would still be needed while the existing works remained operational. It would also create permanent capacity beyond the scope required to remedy the identified asset-health defect, with additional planning, land, design and lifetime maintenance costs. On current evidence, temporary treatment followed by repair is the more proportionate solution. This conclusion will be retested as intrusive investigation confirms the final repair scope.

4.3.2.2 Duration of the Embleton enabling works

182. The nine-week allowance is a prudent planning assumption at this stage, not an assertion that every activity requires nine full weeks. The current activity-level programme indicates six to seven weeks, including isolation, cleaning,

inspection, repair, curing and recommissioning, with a further one to two weeks for risk. The nine-week assumption allows for uncertainty that cannot be resolved until the tank is drained and inspected.

FIGURE 28 - ANTICIPATED DURATION OF ENABLING ACTIVITIES AT EMBLETON

Activity	Typical duration
Set up and testing of temporary treatment	1 week
Drain down	1 day
Tank cleaning	3 days
Intrusive inspection	1 day
Repair works	1 week
Concrete curing period	1 week
Recommissioning and return to service	1 week
Risk Allowance	1-2 Weeks
Overall expected duration	**6 to 7 weeks**
Planning assumption used for Embleton	**9 weeks**

Source: information from delivery partners and internal project documents

183. In ascertaining the requirements at each site, we applied a consistent methodology across our civils case, including both PSTs and trickling filters. This methodology produced an estimated duration for enabling works. Although Embleton is an example of a site which should deliver within the 9-week duration proposed, we expect a number of trickling filter sites to require enabling works beyond the proposed duration, due to the additional complexities associated with delivering continued biological treatment.

184. Enabling works to retain biological treatment processes in the absence of trickling filters are required for microbial populations to establish and stabilise. The duration is inherently influenced by seasonal temperatures and operating conditions and therefore cannot be assumed to occur instantaneously following installation.

185. Based on specialist contractor experience gained from delivery of comparable wastewater treatment schemes over more than ten years, establishment of effective biological treatment typically requires 2-3 weeks where BOD treatment alone is required and 4-6 weeks where stable nitrification performance must also be achieved. A specific example of enabling works deployed in June 2026, where ammonia treatment was necessary, took 6 weeks to fully seed. Delivery partners advised that this duration could rise to 8 weeks in the winter. These risks posed by the additional complexity of biological treatment and cold weather could not be fully captured in our original enabling works methodology.

186. In summary, while a number of sites may deviate from proposed durations due to current levels of uncertainty, this methodology represents a balanced view of the enabling works required when reviewing the civils case in its entirety. These differences support the use of portfolio planning assumptions that are refined at scheme level as design progresses.

4.3.3. Evidence from completed schemes

187. Completed schemes at Blyth and Seahouses demonstrate why enabling costs can exceed the permanent civil repair. At Blyth, £85,027 of concrete and penstock repairs required at least £276,861 of identifiable temporary and enabling works, a ratio of 3.3:1. At Seahouses, £179,931 of core repairs required £321,567 of enabling works, a ratio of 1.8:1. These figures exclude some design, supervision, commissioning, welfare and risk costs and are therefore conservative.

FIGURE 29 - BLYTH DISTRIBUTION CHAMBER TARGET COSTS (£, 2022/23 PRICES)

Cost Component	Target cost
Concrete repairs	41,322
Penstocks	43,705
Core repair works subtotal	85,027
Temporary bypass manifold pipework and fittings	78,447
Manifold supports, thrust blocks and shuttering	8,264
Temporary electrical works	38,302
Over-pumping	15,184
Cleaning and tankering	67,473
Temporary scaffolding and access	20,531
Crane operations and transport	30,460
Temporary isolation equipment (bungs, gantries, confined space equipment and access systems)	18,198
Identifiable enabling and temporary works subtotal	276,861
Enabling: core repair ratio	**3.3 : 1**

Source: internal project cost records

FIGURE 30 - SEASHOUSES DISTRIBUTION CHAMBER COSTS (£, 2022/23 PRICES)

Cost Component	Target cost
Core repair works (concrete repairs and penstock replacement)	179,931
Systems integration	36,506
Tank cleaning	14,985
Overpumping	134,593
Electrical & Instrumentation	50,490
Materials testing	7,246
Security cameras	16,811
Diamond drilling	3,163
Landscaping	2,263
Metalwork	20,729
Scaffolding	11,594
SBR isolation and access	23,187
Identifiable enabling and temporary works subtotal	321,567
Enabling: repair cost ratio	**1.8 : 1**

Source: internal project cost records

188. Both examples involved operational assets that could not simply be isolated. Temporary flow management, pumping, electrical works, cleaning, access and process stabilisation were necessary to maintain treatment. They demonstrate that enabling cost is determined by the operational consequences of taking an asset out of service, not by the physical size or price of the repair.

4.3.4. Conclusion and customer protection

189. The proposed enabling costs are based on the best available site and operational evidence and are proportionate to the need to maintain safe, compliant treatment during delivery. We will confirm the final method and duration following intrusive inspection and detailed design. Where enabling works are unnecessary, shorter than assumed or replaced by a lower-cost method, the PCD framework will ensure that customers do not fund undelivered scope.

190. Equally, the evidence from completed schemes shows that a simple cap based on the value of the permanent repair would materially understate the efficient cost of working on live treatment assets.

4.4. BOREHOLES ADDITIONAL EVIDENCE

191. In this section we set out additional evidence for borehole cases including:

- Delivery specific risk evidence for boreholes (see section 4.4.1);
- Additional evidence on borehole condition assessments (see section 4.4.2); and
- A change request for Felkington (see section 4.4.3).

4.4.1. Delivery specific risks

192. Ofwat's draft determination said that, while Northumbrian Water provided robust programme-level evidence demonstrating the deliverability of the borehole replacement programme, additional evidence is required to demonstrate that scheme-specific delivery risks have been identified and appropriately considered.

193. In response, we have undertaken a review of our delivery assumptions and individual site factors that impact on timescales and risks to the programme. Below, we demonstrate that delivery considerations have been fully incorporated into the development of each scheme and that residual risks are understood and manageable within the proposed delivery programme.

194. For our original submission, our Project Management Office (PMO) teams created the delivery plan outlined in Appendix 5 of our original submission. To do this, they used our project estimating software, using a standard project template. They then implemented known asset specific timescales for borehole schemes, and allocated a score based on the difficulty/complexity of the projects, to understand the time needed. Figure 31 outlines the assumptions and scoring used to define the delivery timescales for our refurbishment and new borehole scheme respectively. For

borehole refurbishment, the schemes received a score of 35, which aligns to a short delivery cycle, and for new boreholes a score of 85, aligning to a long delivery cycle.

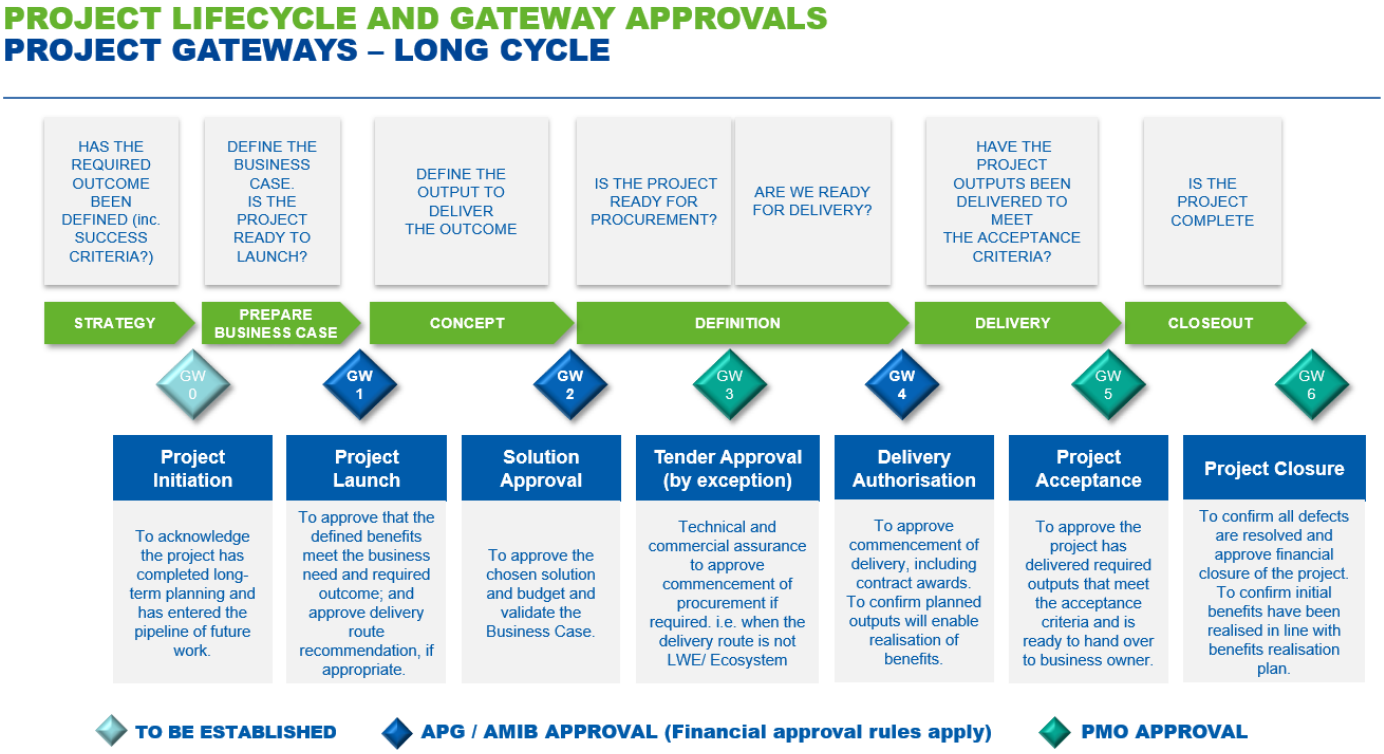
FIGURE 31 – DELIVERY ROUTE SELECTION MODEL (DRSM) SCORING

Category	Description	Borehole Refurbishment Score	Drill New Borehole Score
Complexity	What is the complexity level and does this change through the design phase? E.g. High - Complex new construction, major refurbishment of existing civil structure structures, MIECA, new processes, would require complex design.	0: Low, not a major refurbishment	30: High, multiple levels of complexity outlined in risk assessment
Risk	What is the risk exposure? (technical/ stakeholder/ commercial) e.g. this could include complex land purchase and prolonged planning permission	0: Low, no land implications or stakeholder management	30: High, in many cases, land, surveys, permissions needed
Optimisation	Opportunity to batch at programme level for efficiency?	15: Ability to batch by region, but each site does have different requirements	15: Ability to batch by region, but each site does have different requirements
Repeatability	Opportunity to create long term value through standardisation?	10: Ability to assess different refurbishment activities and standardise	0: No ability to standardise as site/area needs are too specific
Technology	Is this new technology?	0: No	0: No
Delivery Time	Months or Years?	5: Need years, must align to seasonal/demand timings needed to deliver	5: Need years, particularly for land acquisition, and ability to drill trial/successful bores
Cost	Is the affordability Target >£5M?	5: Yes, in total above 5m	5: Yes, in total above 5m
Total		35 (Short cycle)	85 (Long cycle)

Source: Risk information from our PMO team

195. The projects we have proposed are not yet in detailed design, and so, recognising the complexity and the uncertainties faced they were considered to require additional time. So, we recommend a 6-year timescale for delivery for the larger projects. For the smaller scale projects, these are possible to complete within the AMP. In addition, the long cycle projects will go through continuous delivery reviews outlined in Figure 32. The replacements will be delivered using a "sub-programme" approach.

FIGURE 32: LIFECYCLE AND APPROVALS FOR LONG CYCLE PROJECTS



Source: NWL PMO team

196. As part of this assessment, the project and delivery teams have also considered asset specific challenges such as supply chain and specialist drilling contractor availability. To mitigate this, since the draft determination, we have already been in contact with strategic technical partners and contractors to secure resources and ensure timelines can be met. When modelling, we have also considered stakeholder engagement requirements, including landowners, regulators and local communities.

197. Figure 33 outlines known risks for the individual projects. The vast majority of these projects are at very early stages and as such the risks may appear generic, but they are specific to the site and preferred solution. Land, land availability and timely acquisition are key for a good number of the schemes. However, there is land available or already acquired for a number of the projects and this is low risk. A further risk to borehole construction is around the pilot bore and does that access point into the aquifer provide the quality and quantity required or is a further pilot required. This can only be ascertained during the piloting phase. Finally, when constructing the production bore there can be structural, quantity and quality issues that present during this phase. Each scheme will be carefully planned and executed to manage and mitigate and respond to these risks. A further risk is that the Environment Agency does not license the required quantity. Pre-application consultation, groundwater modelling, and site reconnaissance are all undertaken to identify the best locations and satisfy EA requirements. Once a site has been selected water feature surveys, test

pumping and monitoring is undertaken. This is routine activity for NWL. As noted above the new bore schemes are being planned through long-cycle delivery to account for this uncertainty.

FIGURE 33: SITE SPECIFIC DELIVERY RISKS AND ASSUMPTIONS

Site	DRSM Score	Preferred action	Land lease and purchase risk	Other delivery risks
Syleham Crag	85	Drill replacement	Land purchase in progress	A risk here is delayed completion due to drilling detrimentally affecting WQ of nearby operational boreholes. This risk is managed through monitoring and operational controls
Holton Valley Farm	85	Drill an additional	Land purchased	The production bore quality has elevated iron and manganese, which cannot be treated by the existing process. Currently investigating treatment solutions.
Mendlesham Works	85	Drill new	Land lease and purchase in progress	Yield, WQ and Licence risks as discussed in para 197
	n/a	Carry out pending remediation work		
Bleach Green	35	Acidise	Land not needed	Delayed completion if unable to take other operation site bore OOS
Saxmundham	85	Drill new	Land owned, site access required	Yield and WQ risks as discussed in para 197
Halesworth	85	Drill new	Land needed	Yield, WQ and Licence risks as discussed in para 197
Waveney Chalk	85	Drill replacement	Land may be required, site investigations to confirm	Yield, WQ and Licence risks as discussed in para 197
Puddingmoor	85	Drill additional	Land needed	Yield, WQ and Licence risks as discussed in para 197
Barsham Shipmeadow	85	Drill additional	Land available, site investigation to confirm stability	Yield, WQ and Licence risks as discussed in para 197
Barsham Hall	85	Drill additional	Land needed	Yield, WQ and Licence risks as discussed in para 197
Holton	85	Drill additional	Land needed	Licence risks as discussed in para 197 (Yield and WQ risk very low due to plan to drill adjacent to existing bore)
Bungay	85	Drill additional	Land not needed	Yield, WQ and Licence risks as discussed in para 197
Fowberry Mains A	35	Headworks refurbishment (grout annulus)	Land not needed	Currently out of service due to turbidity performance. A shutdown is therefore not required to work on headworks
Fowberry Treatment BH1	85	Drill additional	Land needed	Yield, WQ and Licence risks as discussed in para 197
Fowberry Mains B	35	Clean (only acidise if mechanical cleaning is ineffective)	Land not needed	Currently out of service due to wq performance. We cannot operate Fowberry Mains A while cleaning B. So careful planning with Fowberry Mains A amazon filter install is required
Thornton Bog	35	Refurbish	Land not needed	Low risk activity, proximity of other bore needs consideration during planning and execution
	n/a	Perform surveys	Land not needed	Low risk activity
Felkington	35	Refurbish	-	See section 4.4.3
	n/a	Perform surveys	Land not needed	See section 4.4.3
Fulwell	n/a	Perform surveys	Land not needed	Low risk activity
Benhall	35	n/a	n/a	See para 200

Source: NWL Tactical Planning and Water Resources Hydrologist teams

198. We have therefore assessed the risks posed by the schemes and incorporated them into our delivery planning as much as possible at this gateway stage of a project. We have used both modelling and professional judgement to assess the asset-specific challenges and outline a delivery plan that is achievable based on this.

4.4.2. Additional evidence on borehole conditions

4.4.2.1 Condition grade scores

199. In our initial submission, we included condition grades against all our boreholes, aligning with the Ofwat methodology. We said that we still had further work to do, with our specialist contractor (EGS) reviewing all scores (they had only completed 6 out of 19 at the time of submission). We include the rest of the scores below to ensure we are offering complete data and information on our case.

200. This review identified that Benhall 4 does not meet the criteria for the asset health cost change process (as it has a higher condition grade). We therefore **remove this** from our claim. No other sites have changed.

FIGURE 34 – BOREHOLE CONDITION GRADES

Site Name	EGS Survey Date	EGS Review Date	Borehole CG	Extent	Headworks CG	Combined
Syleham Borehole 2 Crag ABS	14/12/2018	10/07/2026	**4**	D	2	3.5 D
Holton Borehole 3 ABS	08/10/2024	10/07/2026	**3**	E	2	2.75 E
Holton Borehole 4 ABS	03/12/2024	10/07/2026	**4**	E	3	3.75 E
Bleach Green Borehole 1 ABS	07/12/2022	27/07/2026	**5**	E	2	4.25 E
Saxmundham Borehole No 1 East ABS	12/08/2025	28/07/2026	**5**	E	4	4.75 E
Bungay Borehole 1 ABS	12/05/2022	28/07/2026	**5**	B	4	4.75 B
Benhall BH 4	07/03/2014	30/07/2026	**2**	A	3* *(note: no headworks present, only headplate)*	2.25 A
Fowberry Mains Borehole 1 ABS	17/12/2024	29/07/2026	**4**	B	2	3.5 B
Fowberry Mains Borehole 2 ABS	04/11/2025	29/07/2026	**4**	E	2	3.5 E
Fulwell Borehole ABS	18/02/2021	28/07/2026	**4**	C	5	4.25 C
Thornton Bog Borehole 1 ABS	12/09/2014	28/07/2026	**4**	C	2	3.5 C

Source: professional contractor surveys

4.4.3. Felkington 1: change of request

201. In our original case, we submitted the proposal of a *preferred* option of refurbishment of Felkington 1.

202. However, since this submission, a CCTV and geophysical survey has been undertaken and uncovered a more severe situation. This has led to the reassessment of our preferred action, with refurbishment now not seen as feasible, we therefore ask Ofwat to consider the case using the *alternative* option, where a new borehole is required to be drilled.

The costings, options and delivery have been benchmarked and assessed as part of the initial submission, and we are confident that, if funded this can be delivered alongside the other projects.

4.4.3.1 Evidence

203. In June 2026 Northumbrian water commissioned a CCTV and geophysical survey[27]. This found that the borehole appears to terminate at approximately 170m due to an accumulation of sediment and debris. The top of the UPVC liner could not be seen. The obstruction may include an object that has fallen into the borehole, or fragments of the degrading steel casing with sediment subsequently accumulating above them.

204. The survey also identified significant encrustation, corrosion and pitting in the steel casing, particularly around the historic pump intake depth. In places, large flakes of steel appear to be detaching from the casing.

4.4.3.2 Assessment of remediation

205. Meaningful remediation would require removal of the sediment and debris above the UPVC liner, followed by recovery of the liner itself. The borehole diameter is too narrow to allow a camera and recovery tool from being used simultaneously, so recovery would have to be attempted without visual guidance. This means that there is a significant risk that the UPVC would break, become stuck or further obstruct the borehole.

206. Unfortunately, conventional borehole cleaning is unlikely to provide benefit. The upper 170m consists of plain casing with no screen slots to clean, while aggressive cleaning could remove further weakened steel and worsen the obstruction. Cleaning equipment could not safely pass below 170m and would not resolve the underlying mudstone isolation problem.

207. Intrusive remediation would therefore put the existing reliable output of approximately 1.08 Ml/d at risk, without providing sufficient confidence that the additional licensed capacity could be recovered.

208. In AMP7 a scheme was undertaken to develop a new borehole at Felkington, this Felkington 2 borehole was developed to supplement supplies from Felkington 1. The Felkington 2 borehole was developed by targeting a different aquifer unit but has not delivered the yield required to replace Felkington 1. The proposed Felkington 3 borehole would instead target the same aquifer unit as Felkington 1, with the objective of replacing the deteriorating source. The NPV assessment indicates that neither option delivers a positive NPV. This outcome is driven by the relatively young age of the Felkington 1 borehole, with the assessment model assuming a further 30 years of operational life and a low failure rate over that period. Under those assumptions, immediate investment would not be economically justified. However, Felkington 1 borehole is close to failure and yield is reduced to 1.08Ml/d with the potential consequence of losing that volume should a further failure occur.

[27] NES-CCP-DDR-06 - NWL2608_Felkington_ABH1_Rev1_Rpt. We provide this document alongside our response.

4.4.3.3 Efficient costs

209. As part of the original submission, T&T also benchmarked the costs to drill a new borehole at Felkington. The table below sets out the benchmarking results.

FIGURE 35 – T&T BENCHMARKING FOR FELKINGTON NEW DRILL (2022/23 PRICES)

	NWL Capex Costs (£)	T&T Benchmark (£)	Variance (£)	Variance (%)
Direct costs	1,636,220	1,963,230	327,009	19.99%
Contract overheads	891,418	1,177,938	286,520	32.14%
Project overheads	462,040	628,234	166,193	35.97%
Risk	448,452	376,940	-71,512	-15.95%
Estimating uncertainty	896,903	1,130,820	233,917	26.08%
Total	4,335,034	5,277,162	942,127	21.73%[28]

Source: T&T benchmarking

210. Our overall costs are over 21% lower than the T&T benchmarks, demonstrating that our cost for this option is efficient. All areas of the costing were lower than the benchmarks, with the exception of those associated with risk, where they were almost 16% higher.

4.4.3.4 Conclusion

211. Our initial submission outlined a need for Felkington 1, which Ofwat agreed to and accepted the funding for a refurbishment. Following the June 2026 survey, this has now been deemed unfeasible due to high collapse risk and low benefit identification. The preferred approach is therefore now to replace the borehole, to a similar depth on the existing Felkington site, to deliver the full license of 2.02Ml/d and run Felkington 1 at 1.08Ml/d until this is done.

212. A new borehole would also target the proven sandstone of Felkington 1, rather than a previously untargeted unit as was attempted and unsuccessful with Felkington 2. Changing to the previously *'alternative'* option of drilling new would protect the existing supply while pursuing the potential recovery of approximately 0.94 Ml/d of currently lost capacity and improving supply demand balance across the Murton system. This would change the funding request to **£4,335,034**[29] from £180,000 (2022/23 prices). In line with the other new bores, we expect to complete this project by 31 March 2033.

[28] The benchmarking of total cost for this option can also be seen on page 7 of Appendix 1 – NWL Asset Health Benchmarking Report submitted in May.
[29] We provide the IMOD costing report for Felkington, NES-CCP-DDR-04 - OFWAT Reopener - Felkington BH - iMOD Report R1. Note that the capex in the IMOD is £4,920,087.52 which is in Q4 2025 prices.

5. OPERATION OF THE PCD FRAMEWORK

213. In this section we discuss:

- Our concerns with the proposed PCD framework and our proposed alternative; and
- Some smaller issues within the detail of Ofwat's proposals if they are retained in their current form.

5.1. OUR CONCERNS WITH THE PROPOSED APPROACH TO PCDS

214. We agree that a robust PCD framework is required to ensure that customers are protected and that companies are held to account for the additional investment provided by the cost change process. However, we do not think that the DD proposed approach does this in the best way. In particular:

- It is asymmetric in its application – a company could overspend on one asset class and underspend on another asset but the proposed PCDs would not allow these to offset and would instead claw back the entirety of the underspend on one of the assets. We do not think this is a fair risk balance for companies to face.
- It risks diminishing efficiency incentives – if a company knows that it is able to underspend an allowance through efficiencies then it may be encouraged through the PCD design to overengineer the solution so that the cost saving is not realised as it would otherwise be handed back in its entirety.

215. We think that a PCD framework for the cost change process should achieve the following objectives:

- Companies should be expected to deliver volumes of activity from base that are in line with what base buys.
- Companies should be expected to deliver the additional investments funded under the cost change process.
- The balance of risk should be consistent with the wider PR24 package which the allowed cost of capital compensates for. This means that there should not be asymmetric treatment of under- and overspends across different assets.
- Companies should be expected to spend their existing base allowances before accessing additional funds from the cost change process.
- Within the constraints above, efficiency incentives should be maintained.

216. We think these objectives would protect customers both by requiring companies to deliver the investments they have paid for and by also promoting efficiency and not increasing risk and be fair to companies.

217. To achieve these objectives we think that a simpler formulation of the PCD can be formulated as follows:

- There should be a single what base buys PCD across *all* of the priority assets where funding is being awarded instead of an induvial PCD for each asset type. This will still ensure that companies deliver the aggregate level of activity from existing allowances for the assets in question but won't penalise companies if they spend more on one asset and less on another. It will also be significantly simpler reducing regulatory burdens and unnecessary complexity.

- There should be individual PCDs for each of the projects funded by the cost change to ensure that they are delivered and that customers get what they have paid for through the additional allowances. If companies do not deliver a scheme the funding should be returned to customers.
- If a company underspends its combined base and cost change allowances then it seems fair to return the underspend to customers (up to the limit of the cost change allowances) as the additional allowances were not needed on top of base. This is the same as the commitment we made in our PR24 plan around our asset health case[30].
- If a company overspends it combined base and cost change allowances then cost sharing should apply in the normal way. Customers and the company will share the risk of the aggregate overspend in the same way as the PR24 settlement and overall risk package was designed. We don't think it is reasonable to claw back underspends on the cost change allowance alone without allowing any offset with the wider price control.

218. We illustrate how our approach compares to the costs change DD approach in the following worked example set out below.

FIGURE 36: PCD APPLICATION WORKED EXAMPLE

	Ofwat PCD approach	NWL PCD approach
Scenario components		
Base overspend against allowances (underspend -ve)	Base allowance: £1,000m Base expenditure: £1,150m Overspend: £150m	
Spend against WBB on funded priority assets	Asset A: WBB=£10m, Spend=£5m, Underspend=£5m Asset B: WBB=£10m, Spend=£15m, Overspend=£5m Net position: Overspend - NIL	
Spend against additional investment	Asset A: Allowance=£10m, Spend=£10m, Overspend: NIL Asset B: Allowance=£10m, Spend=£8m, Underspend: £2m Net position: Underspend £2m	
Delivery of additional investment in cost change process	All individual investments are delivered	
Aggregate spend position	Base: £150m overspend Additional cost change investment: £2m underspend Aggregate position: £148m overspend	

Operation of PCD framework	**Ofwat PCD approach**	**NWL PCD approach**
Adjustment from WBB PCD	£5m clawed back from underspend on asset A	No adjustment as no net underspend
Adjustment from individual investment PCDs	None as all delivered	None as all delivered
Adjustment from stage 2 PCD on additional investment	£2m clawed back from underspend on Asset B	None: underspend against additional investment is more than offset with base overspend
Adjustment from overall base position	None – base allowances have been spent	None – base allowances have been spent
Total impact from PCD framework	£7m clawback	None – all additional assets delivered. Aggregate position is £148m overspend

Source: NWL Analysis

[30] https://www.nwg.co.uk/globalassets/business-plan-2025-30/nes35.pdf Section 8 Customer Protection

219. This example highlights some key differences between the approaches:

- Our approach allows netting off between assets and avoids asymmetric clawbacks as the Ofwat approach would do even though the company has spent WBB on the two assets combined and customers are still getting in aggregate what they paid for from base.
- Our approach does not seek to clawback the underspend on the additional investment and treats in the same way as other deviations from allowances through the normal operation of cost sharing. This ensures that the additional investment provided by the cost change is a 'fair bet' for companies as over and underspends would be treated equally. Under the Ofwat approach, it creates an expected loss for companies if it is equally likely that there will be an underspend (clawback in entirety) as an overspend (cost sharing applies). This is not a fair risk balance for companies and is not included in the calibration of the PR24 WACC.

220. In addition to these points there are 3 further arguments that support our approach:

- Simplicity: our approach is significantly simpler to understand and operate. It has a single aggregated PCD for WBB. Unless a company underspends its base allowances then normal cost sharing can apply to deviations on spend in both directions for the additional investment rather than asymmetric treatment on an asset by asset basis.
- Efficiency: our approach promotes more efficient delivery in 2 areas in the example. In the areas of underspend (asset A WBB and asset B additional investment) the company is less incentivised to deliver efficiently as all gains are clawed back in their entirety under the Ofwat approach. Under our approach there is netting off of the position across WBB and symmetric treatment of over and underspends on the additional investment which avoids these worsened incentives.
- Effective prioritisation: The company in the example will have incentives to undertake more work in WBB for asset even if other areas of spend offer greater benefits for customers. Within a fixed budget this would promote worse customer and environmental outcomes if spend is diverted to this area to avoid a claw back under the PCD.

221. Overall we think our approach promotes better outcomes and offers a fair risk balance for customers and companies. We would be happy to discuss this further with Ofwat if helpful.

5.2. ADDITIONAL POINTS

222. We have already queried an error where some of the expenditure due by 2032/33 would be (erroneously) expected to be spent by 2030 by this mechanism, and Ofwat has confirmed that this will be corrected. This applies to network storage, boreholes, trickling filters and settlement tanks. As part of updating the PCDs we also ask Ofwat to take account of the changed expenditure profiles set out in section 8.3. We still expect the investments to be operational by the same dates, but because the PCDs in the DD are partly specified in terms of expenditure we have taken account of the post commissioning costs that are incurred after this date (reinstatement etc).

223. Separately, we welcome the flexibility in the gravity sewer replacement that allows swaps between categories of pipe diameters and locations, within the overall total length of sewer rehabilitated. This is similar to our proposal at PR24 and the CMA for swaps between lead replacement categories, where there is uncertainty about exactly what can be found to replace in practice, and we would like to see this flexibility extended in future price reviews (we can see that implementing the “use it or lose it” approach has enabled this to work while protecting customers). However, it is not quite clear what happens if we deliver *more* than the length allowed, within the overall totex allowance – that is, if we are efficient and use the savings to deliver a greater length of sewers, will this be clawed back?

6. ADDITIONAL EVIDENCE IN RELATION TO THE BRAN SANDS LONG SEA OUTFALL

224. In our submission, our assurance providers made three recommendations that we have been taking further. We can confirm that we have completed these actions, and we provide additional evidence for these alongside this response. These recommendations were as follows:

- Establish a single controlled cost reconciliation. That is: prepare one clear, controlled reconciliation from the Aqua, Costain and Haskoning estimates to the final Submission 2 construction cost, with explicit support for provisional, benchmarked and indirectly derived allowances. Ofwat asked us to explain how we have satisfied ourselves that the three cost estimates used in the triangulation are like-for-like and thus comparable.
- Strengthen evidence for material cost drivers. That is: improve the audit trail for major cost elements, particularly the offshore package and quantified risk, through clearer benchmark variance analysis and stronger underlying source support.
- Strengthen the programme-to-cost linkage. That is: clearly demonstrate how preliminaries, contractor indirects, client costs and other duration-sensitive allowances are derived from the programme, with transparent assumptions and evidence for key duration drivers.

225. We confirmed in our query response that this was underway. We now provide the documentary evidence as requested to support the response to the draft determination. The evidence is provided in Bran Sands appendices in the form of consolidated cost estimate; additional evidence of engagement with a specialist marine contractor; risk register update; programme update and planned cost curve.

6.1. SINGLE CONTROLLED COST RECONCILIATION

226. The evidence we provide to address this point is the updated cost estimate included in appendix 6.1 Controlled Cost Reconciliation.

227. In response to the recommendation to develop a consolidated cost estimate we engaged Turner & Townsend (T&T) to undertake a reconciliation of the Aqua, Costain and Haskoning estimates and produce an estimate that would be suitable to be used as a baseline for measuring future change and aligned to the NWL standard cost breakdown structure.

228. T&T reviewed the three sources of estimate and initially checked that each estimate was suitable for triangulation and had been based on the same project scope. The review confirmed that there was good scope alignment across the four core elements of the project and no material scope omissions were identified in any of the estimates.

229. The key area of difference was the assumptions each estimate had taken when considering construction methodology, temporary works, installation sequencing, productivity and procurement strategy. T&T's assessment of the three sources of cost data recognises the differences in the assumptions made and they acknowledge that this is a common

factor in the reconciliation of different sources of data. They have taken this into consideration in the assessment and selection of the most appropriate sources for each element of scope.

230. Following confirmation of scope alignment, a common work breakdown structure was applied to all three estimates. Each major work package was reviewed individually to determine which estimate provided the most appropriate basis for the Submission 2 position and production of the single controlled cost reconciliation. The basis upon which the costs source was selected is described below.

6.1.1. Scheme Direct Costs

231. Pumping Station: Aqua's cost estimate was developed using data from comparable pumping station projects. The data sources were considered appropriate to and comparable with the current level of design maturity. The estimate includes the pumping station structure, mechanical and electrical plant, power supply infrastructure and associated process systems. T&T concluded that the Aqua cost estimate should be adopted as most representative of costs for this element of the scope rather than either of the estimates provided by Costain or Haskoning.

232. Onshore Open-Cut Pipeline, Onshore Trenchless Pipeline and Offshore Pipeline: the Costain estimate for these elements was developed using detailed bottom-up quantities and project-specific construction methodologies. This approach was selected as the pipeline route has a number of unique challenges and interfaces. T&T concluded that this approach was more robust than the benchmarking approaches provided Aqua and Haskoning.

233. The resulting direct works allowance therefore combines:

- Aqua-derived costs for the Pumping Station; and
- Costain-derived costs for all onshore and offshore pipeline works

234. Due to the lack of supporting evidence in the Haskoning estimate it was not suitable to be used as the primary source for any of the work packages, but did support the overall review.

6.1.2. Scheme Indirect Costs

235. T&T undertook a separate reconciliation for contractor indirect costs to ensure consistency across the estimates. This was necessary because Aqua, Costain and Haskoning each adopted different approaches to the presentation and allocation of preliminaries, overhead and profit.

236. Preliminaries: This allowance was derived from the anticipated delivery programme and construction duration. This cost reflects the management, supervision, temporary facilities, site establishment and coordination activities required to deliver a project of this scale. T&T have allowed for main contractor preliminaries of £22.9m, equivalent to approximately 17% of Direct Works Cost.

237. This approach is justified as T&T identified that £15.6m of preliminaries were already embedded within the direct works. This includes approximately £12.3m of offshore subcontractor preliminaries and a further £3.3m associated with the onshore pipeline works.

238. Contractor Overhead and Profit: An allowance of 9.75%, aligned with the Living Water Enterprise Framework fee has been included. This is aligned to the proposed term and conditions of the delivery contract and produces an allowance of approximately £15.2m and provides a transparent and auditable basis for contractor commercial costs while avoiding double counting within the reconciled estimate structure.

239. Estimating uncertainty: No subsequent change has been made to the allowance for scope and estimating uncertainty as part of this reconciliation as the project remains in the definition stage and is yet to complete design and environmental studies required prior to submission of the planning applications. The allowance for risk has been adjusted to reflect the latest risk register and client costs have been updated to reflect actuals and forecast cost.

240. The latest estimate now provides a single baseline for measuring change as the project progresses through the next stages of design maturation and environmental studies prior to drafting the required planning applications.

FIGURE 37: SUBMISSION TWO CONSTRUCTION COSTS

	Value (Current prices)	Adjusted Value (2022/23 prices)
Construction Scope	£171,195,174	£151,363,124
Client Costs	£38,904,418	£34,397,548
Risk Register	£41,627,451	£36,805,132
15% Scope & Estimating Uncertainty	£37,759,057	£33,384,871
Total	**£289,486,100**	**£255,950,675**

Source: NWL Analysis

6.2. EVIDENCE FOR MATERIAL COST DRIVERS

6.2.1. Engagement with Specialist Marine Contractor

241. In response to the request for evidence for material cost drivers specifically for the offshore package, we have engaged directly with the proposed marine contractor. relating to the offshore package. We asked them to provide information that would support improved transparency for cost and programme input, including: the basis for their estimate; primary operations and work areas; proposed marine equipment; supporting equipment, labour and materials; likely marine equipment and durations; proposed weather risk/downtime per item of equipment; datasheets for proposed plant; and an outline programme. This response document is provided in appendix 6.2 Marine Contractor.

242. Review of the evidence supplied by the marine contractor provides clarity on the basis of estimate, which includes reference to the concept design details and states both assumptions and exclusions. Some evidence is provided to support understanding of their proposed methodology and while there is insufficient information provided to validate

all current programme assumptions, our own experts experience in dredging and marine pipelines as well as the engagement with the marine contractor to date has confirmed that the overall assessment of operations and programme is well reasoned

243. The proposed marine contractor has identified the key equipment required for delivery of the work. This includes a large backhoe dredger (BHD) and medium-size trailing suction hopper dredger (TSHD). Datasheets are embedded within the appendices for these items.

244. A number of support vessels are identified through the descriptions provided including tug and multicat vessels. The requirement for a pontoon and lifting equipment for on-site pipe preparation is evident. Durations and a programme are provided to support the proposed method of work and deployment of equipment.

245. There are limitations to what the marine contactor can provide at this time. Marine site investigations are ongoing, so assumptions have been made on the ground conditions, suitability of the soils for dredging and equipment selection due to the incomplete site information available to them. Recognising that this is a significant work package, there is also commercial sensitivity to providing input at this stage and the marine contractor as a key subcontractor wishes to reserve its position until its scope is fully defined.

246. No provision has been stated by the marine contractor for weather risk/down time. This is the primary risk to this work package and remains a commercially sensitive item. We have therefore made assumptions on behalf of the marine contractor and included these in the programme and risk register.

247. An indicative programme has been provided by the marine contractor. This confirms the intention to derisk the contract by delivering the works in a single marine season. Once we add an allowance for time risk, there is limited flexibility in the programme provided by the marine contractor, and we see this as optimistic. There is allowance in our programme for a second marine season if required, though this presents a risk to delivery. We intend to work collaboratively between parties to reduce design risk and maximise delivery opportunity to undertake the marine works in a single year to reduce risk, cost and disruption to the marine environment, port and sea users

6.2.2. Quantified risk register

248. In response to the request for evidence for material cost drivers we have provided an updated risk register (provided in appendix 6.2 Bran Sands LSO Risk Register), which reflects progress since the last submission. This includes the realisation or retirement of risks in the previous period and addition of new risks. For all risks in the latest risk register we have provided a quantified assessment of time and cost. These assessments have been made with due consideration of the current programme and cost estimate.

249. To support validation of the risk estimates we have aligned them to the programme and to the planned cost curve to inform our estimates of cost and time impact.

250. This exercise has supported maturation of the risk register and through validation against the programme and the planned cost curve provides a high level of confidence in the risk estimates. The updated risk register (provided in appendix 6.2 Bran Sands LSO Risk Register) helps to establish the evidence for material cost drivers and programme-to-cost linkage.

6.3. STRENGTHENING THE PROGRAMME-TO-COST LINKAGE

6.3.1. Programme update

251. We have updated the project delivery as included in appendix 6.3 Bran Sands LSO Programme with additional activities in its Work Breakdown Structure (WBS) and our consolidated cost estimate with logical Cost Breakdown Structure (CBS) and this has enabled us to confirm alignment between the programme and estimate.

252. Following our previous submission we have continued to track progress against the programme and develop the activity breakdown. We have also started to use the programme to draw attention to the individual risk items by creating a direct link between the activities in the risk register and the programme.

253. To further support and evidence the programme-to-cost linkage we have used the consolidated cost estimate to produce a planned cost curve for the project.

6.3.2. Planned cost curve

254. To strengthen and validate the programme-to-cost linkage we have plotted the planned cost curve for the project. This has allowed us to overlay and visualise the linkage of activity costs to programme demonstrating expected burn rates for the various scope elements and phases of the project which supports risk estimation. This specifically draws out items impacted by overall project duration. This is provided as appendix 6.3 Bran Sands LSO Planned Cost.

6.4. CONCLUDING STATEMENT OF RESPONSE

255. We have acted on the recommendations provided during the third-party assurance of our Submission 2 for Bran Sands Long Sea Outfall. We are satisfied that we have established a single consolidated cost estimate, strengthened our evidence for material cost drivers, namely risk and the offshore work package and the quantified risk register, and strengthened the programme-to-cost linkage by integrating the CBS and WBS to improve alignment and produce a planned cost curve.

256. The evidence to support the statement above is included in Bran Sands appendices comprising a consolidated cost estimate; additional evidence of engagement with a specialist marine contractor; risk register update; programme update; and planned cost curve.

7. IN PERIOD REVENUE POSITION

257. We wrote to Ofwat ahead of its DD publication and highlighted that we were prepared to forgo revenue adjustments for these cost change investments and Ofwat has recognised this in its DD[31]. In our letter we recognised that, because we are behind on our enhancement investment programme for the 2025-30 period so far, we receive a benefit under the Final Determination for the 2024 Price Review (FD24) as amended by the CMA. This occurs because the FD24 provides financing cost allowances (including debt interest allowances and equity issuance costs) to cover the costs of funding some investments that we have not made yet because we are behind our planned investment profile as set out in FD24. We wanted to reflect that fairly in the requested bill increases we made and also are concerned about the affordability of these essential services for customers.

258. We still think that the position adopted in our letter is in the best interests of customers as we think it is right we make progress on catching up our enhancement programme before receiving additional revenue and increasing bills. However, customers also like to have smoothed bills and leaving all of the revenue increase until AMP9 could have a large impact on bills which customers are unlikely to support.

259. We set out below our concerns on the impact on customers if bill rises are left until AMP9 and the work that we plan to do to explore this further so that we strike the right balance between avoiding unnecessary bill rises, ensuring financeability, and taking account of customer preferences for smoothed bills.

7.1. REFLECTING OUR LATEST DELIVERY POSITION

260. In its DD Ofwat rejects in period revenue uplifts for some companies based on their current progress in the delivery of their enhancement programmes, for example in relation to SWW[32] Ofwat notes:

> Our draft decision is to not provide any funding in-period for South West Water.
>
> Whilst we considered that the company may face a financeability constraint on the basis of the notional capital structure over the 2025-30 period, this was on the basis of spending all of its totex allowances. While the company appears on track to deliver by 2029-30, our assessment is that the company has not demonstrated that it is not behind delivery in relation to its water 2025-26 commitments. It has also underspent its year 1 water and wastewater PCD allowances. As such, we do not consider that in-period funding should be provided at this stage. We note that any reduction in financial ratios as a result of the

[31] https://consult.ofwat.gov.uk/consultations/cost-change-2026-draft-determinations/user_uploads/cost-change-draft-determination-2026---northumbrian-water_redacted.pdf p6.
[32] https://consult.ofwat.gov.uk/consultations/cost-change-2026-draft-determinations/user_uploads/cost-change-draft-determination-2026---south-west-water_redacted.pdf

additional expenditure allowances may be mitigated by the current underspend on its PCD water and wastewater allowances.

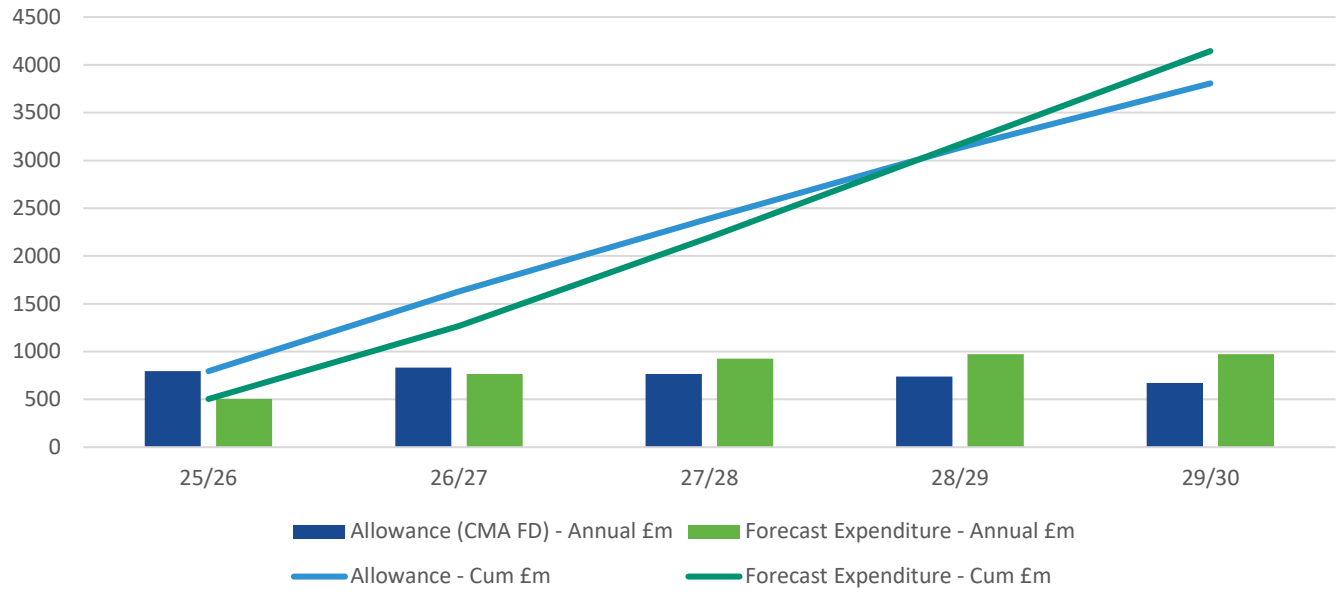
If South West Water wishes to make the case for in-period funding in its response to our draft determination, it should include consideration of the impact of both the cost change and ODI payment processes in its response to the draft determination. This should take account of our draft determination (and the company's view of this) and any other factors or changes since it submitted its claims during the March to May submission window. This should take account of the latest view on progress on delivering existing investment programmes.

261. Whilst we have highlighted that we receive a financing benefit driven by the delivery profile of the enhancement programme versus the profile assumed in FD24, that benefit only exists as long as we are behind the plan. As soon as we catch up with the assumed profile in the plan and are meeting all of our PCDs then any financing benefit is removed. As we highlighted to Ofwat in our letter, whilst we are behind the planned activity currently, we expect to catch up and even exceed our plans across the five-year period.

262. The DD confirmed Ofwat's agreement with our position that we will deliver our PR24 commitments by the end of the 2025-30 period: "overall, we consider that the company provides sufficient and convincing evidence to demonstrate that it remains on track to deliver its PR24 commitments by the end of 2025-30 period"[33]. Our latest capital expenditure forecast versus allowances for NWL is set out in Figure 38 below. Whilst NWL has spent less than the enhancement FD in 2025/26, we plan to catch up over AMP9. Our August 2026 Delivery Plan[34] set out the profile, suggesting an overall cumulative overspend to FD capex.

[33] cost-change-draft-determination-2026---northumbrian-water_redacted.pdf, page 6
[34] delivery-plan-summary---august-2026.pdf see Figure 2

FIGURE 38 - FORECAST AMP8 CAPITAL EXPENDITURE VERSUS ALLOWANCE 2025-30 (£M, 22/23 PRICES)



Source: NWL analysis, as of the NWL August Delivery Plan

263. From the above profile we can see that:

- NWL expects to fully 'catch-up' with the delivery profile of its capex under the FD24 in 2028 and in any event at some point in the final two years of the AMP, it therefore does not appear necessary to us to limit revenue increases to the PR29 true-up mechanism in 2030 bills. It would be more sensible to increase revenues in 2028 or 2029 depending on the progress we make in catching up on our delivery. This was why our letter proposed increasing bills 'until at least the final year of the period (2029/30)'.
- In fact, our forecast delivery profile has improved since the original cost change submission was made, so our delivery confidence is increasing and we expect to catch-up with the capex profile in 2028/29.

264. Our August Delivery plan has also, as part of Ofwat's requirements, been subject to external assurance and that assurance highlights that:

> 'Overall, our review indicates that NWL's FY26 PCD Annual Delivery Plan Progress Report provides a well-progressed and largely well-supported basis for reporting delivery against its PR24 Price Control Deliverables. The majority (in terms of number of PCDs (inc Subsets)) of the £2,358.836m populated PCD allowance is assessed as Green; with delivery on or ahead of profile, credible methodologies and a clear audit trail. Our assessment of current status aligns with NWL's own views on the substantial majority of PCDs.' PwC, NWL PCD Delivery Assurance FY26

265. Whilst the independent report does provide an AMBER rating in relation to our Storm Overflows PCD it notes that:

> 'Full delivery of this PCD is currently forecast with headroom. The Amber rating reflects a back-loaded profile and outstanding cost reconciliation, rather than an expected shortfall.' Ibid

266. The above evidence suggests that, based on the delivery profile forecast and the external assurance we have in place, it would be appropriate to plan for in-period revenue in 2028 or 2029 rather than 2030. As we move through the period, we will be able to continue to track our progress in catching up with the planned investment profile, if we are able to make more rapid progress then it may be more appropriate to increase revenues earlier.

267. Whilst we entirely accept that, because of the delays we have seen to our delivery of the enhancement investment programme, we receive a benefit under that one element of the regulatory settlement, looking at this issue in isolation amounts to cherry picking one element of the regulatory framework by ignoring the overspends for base totex. Any assessment of financeability should be consistent across the key building blocks. We also think that the Delayed Delivery Cashflow Mechanism' (DDCM) already seeks to return additional revenues to customers should companies fall behind certain thresholds on their capital plans. The cost change process therefore does not need to duplicate these protections. We think that Ofwat should consider these points in for its final decision and when assessing future submissions.

7.2. REFLECTING CUSTOMER PREFERENCES IN BILL CHANGES

7.2.1. Substantial historical research suggests customers prefer steady rises over time, not the bill profiles implied by the DD

268. There has been substantial research undertaken with customers over many price reviews as to their preferences for phasing bill changes[35]. Across those research activities customers consistently show preferences for phased and steady increases rather than sudden and substantial rises.

269. The Draft Determination for Severn Trent stated:

> Our assessment did not identify a financeability constraint for Severn Trent Water.
>
> However, we consider the company has provided evidence that the company remains on-track to deliver its commitments over the 2025-30 price control period. Severn Trent Water also provided evidence that customers supported paying for the additional investment during the current price control period. Consequently, our draft determination is to provide in-period funding for the allowed asset health expenditure.[36]

[35] For example, we asked customers at PR24 about their preferred bill profile in the context of asset health specifically and more generally in our pre-acceptability research. Our PR24 business plan discussed our decisions about bill profiles and how we took customer views into account in more depth (NES02, section 5.2).
[36] https://consult.ofwat.gov.uk/consultations/cost-change-2026-draft-determinations/user_uploads/cost-change-draft-determination-2026---severn-trent-water_redacted.pdf p8

270. We have not previously referred to customer bill smoothing, but we do believe that we face a similar challenge to SVT. For NWL, delaying £42m of revenue to the end of the period will increase bills in 2030/31. If we add to that 'backlog' the ongoing £38m pa of return and run off revenue for the £431.8m end of period RCV uplift, we arrive at a substantial 'cliff edge' bill increase in 2030/31 of over 7%. Even if the £42m end of period revenue allowance is smoothed over AMP9, we still have a 2030/31 bill increase of 4.3%.

FIGURE 39 - BILL INCREASE YEAR ON YEAR SCENARIOS %

Year on Year bill increase from FD				
	2027/28	2028/29	2029/30	2030/31
Ofwat's cost change DD position	-	-	-	4.28%
If in-period funding was requested	-	1.24%	1.40%	0.89%

Source: NWL analysis. See NES-CCP-DDR-05 - Figure 39 databook.

271. We consider that it is very unlikely that customers would actually support the proposed bill profiling set out in the DD and actually believe that if we asked customers then they would likely support in-period revenue changes which would be much smaller and reduce the 2030 bill increase by over 75%.

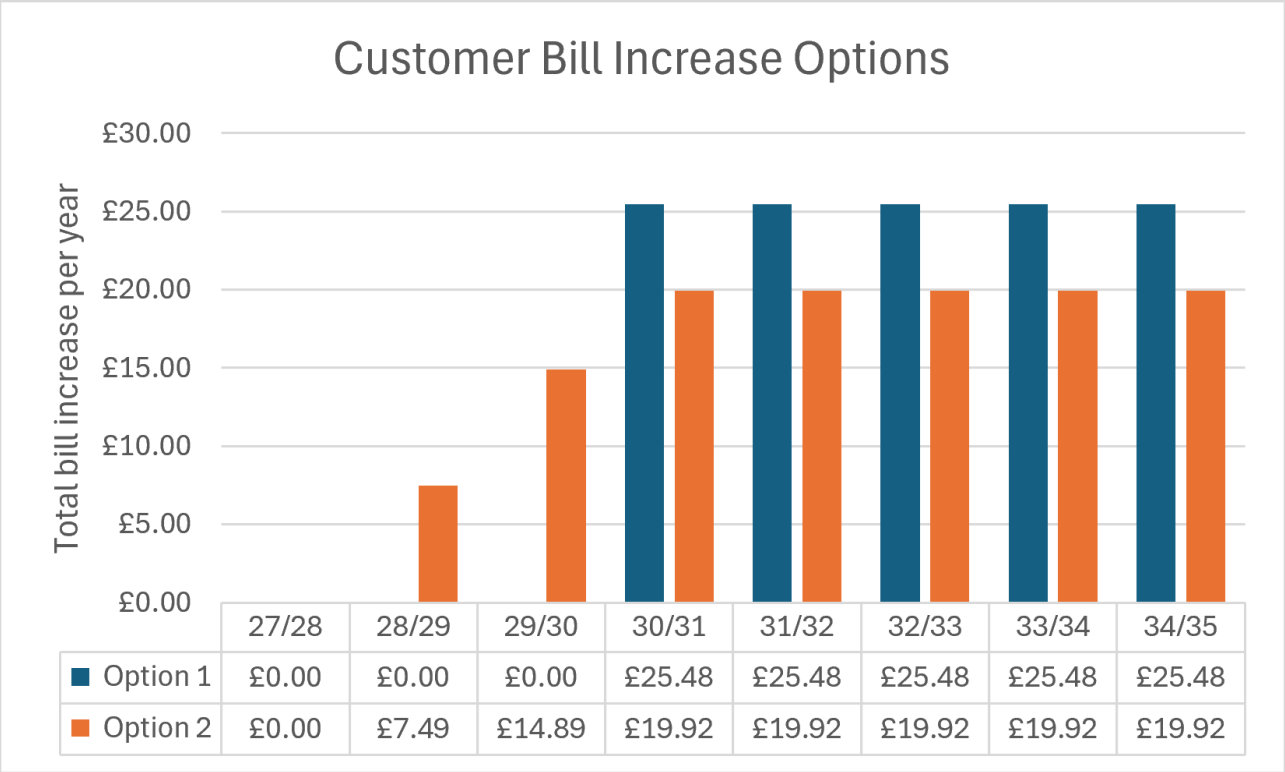
272. We note that Severn Trent did carry out customer research that supported bill smoothing: Further analysis of the SVT submission[37], shows for their customer engagement findings:

> 71% of household customers in our quantitative research found our plans acceptable, and 76% say they are affordable or neutral.
>
> Pay sooner rather than later - While views on timing were more mixed, 42% of household customers supported paying now, 34% didn't know and 24% said pay later. On balance, we believe this supports our case for in period funding.
>
> Smoothing bills for our customers – under our approach bills will increase gradually from April 2027 onwards at a rate customers supported in our research. There will be no sudden increase in 2030 as a consequence of this investment at a time when bills could be increasing to fund 2030-35 investment.

273. We have also undertaken similar research[38] with our customers on their preferred bill phasing and this shows that 67% of customers for both our operating regions preferred a staged bill profile, referring to the increases being easier to budget for in particular. There were no differences for customers on PSR or receiving financial support. This research sought views from customers on two distinct bill profile alternatives, option one which involved delaying all bill increases until 2030 (as per the Ofwat DD) and two which phased increases beginning in 2028 (consistent with Figure 38).

[37] https://www.stwater.co.uk/content/dam/stw/regulatory-library/2026-cost-change-process/01-sve-adapting-our-plans-customer-and-stakeholder-briefing.pdf and https://www.stwater.co.uk/content/dam/stw/regulatory-library/2026-cost-change-process/12-sve-2026-cost-change-customer-research-report-thinks-insight-and-strategy.pdf
[38] Summary customer research slides provided alongside this response. NES-CCP-DDR-01 - Customer bill profile preferences - September 2026.

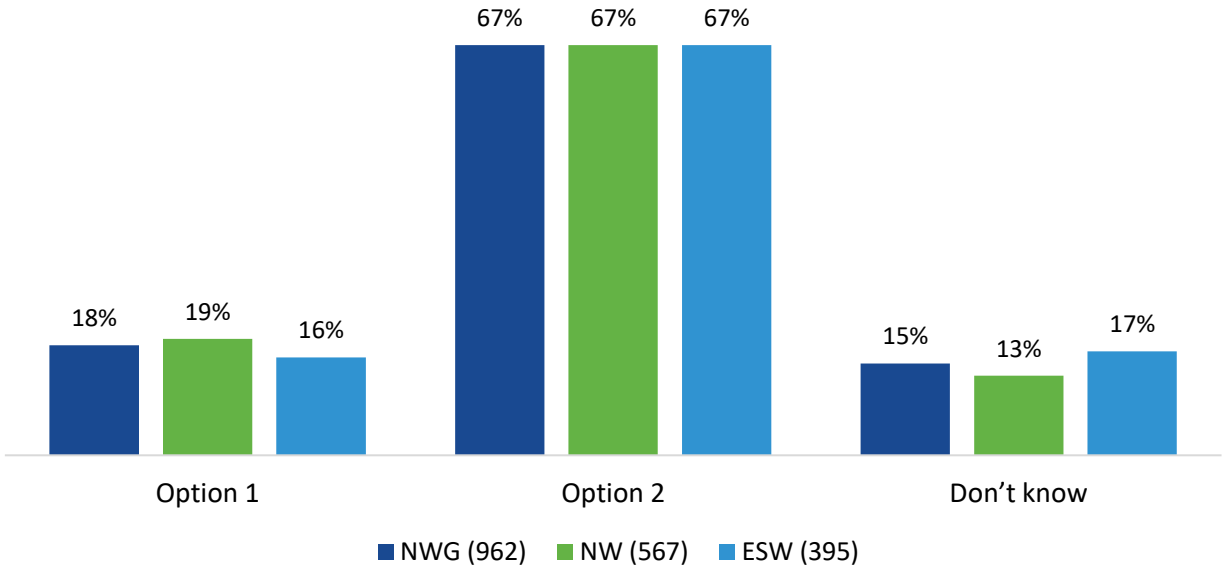
FIGURE 40 – BILL PROFILE OPTIONS PRESENTED IN CUSTOMER RESEARCH



	27/28	28/29	29/30	30/31	31/32	32/33	33/34	34/35
Option 1	£0.00	£0.00	£0.00	£25.48	£25.48	£25.48	£25.48	£25.48
Option 2	£0.00	£7.49	£14.89	£19.92	£19.92	£19.92	£19.92	£19.92

Source: NWL customer research

FIGURE 41 – CUSTOMER RESEARCH RESULTS



Source: NWL customer research

7.2.2. The PR24 regulatory framework already contains more mechanisms that will adjust bills in period and incentives are more high powered

274. We have also thought about the future trajectory of bills for customers in the round. Beyond the bill changes signalled in the PR24 FD, the UK economy is currently experiencing higher and more volatile cost inflation driven in part by global macroeconomic factors and conflicts in the middle east. The PR24 framework also contains more in-period mechanisms that will automatically adjust bills across the period, for example, 23 common performance commitments[39], higher powered customers service incentives or 'MeXes' including the new BR-Mex measure, the new Outturn Adjustment Mechanism, the Revenue Forecasting Incentive, adjustments for bioresources and retail volumes and the single till rebalancing impact of large one-off revenues for diversions and other third-party activity. Moreover, the wider incentives provided in the PR24 FD are also more high-powered which will also affect bill volatility.

275. Our Long Term Strategy also implies that further bill rises are likely to be needed in 2030[40], including to fund the next phase of the Storm Overflows Discharge Reduction Programme (SODRP)[41] and to continue development and construction of new supply-side investments in Essex and Suffolk to ensure we have sufficient water resources to protect the environment and support growth in those regions.

276. Altogether, this suggests that, even outside of the cost change process, it is likely that bills will need to rise and that bill levels could be very volatile up to and beyond 2030. Where we expect customers to support stable bill changes over time, the best approach would be to consider the likely effect of all these mechanisms altogether, identify the best forecast that we believe we are likely to see in the future and then seek to phase or manage those increases in line with the preferences of our customers based on direct engagement and consultation with them.

7.3. OUR PROPOSED APPROACH FOR THE COST CHANGE FD AND GOING FORWARD

277. We noted in that letter that we would keep this matter open and revisit this in the future. Our overwhelming concern is to ensure that the future profile of bills is managed and reflects the preferences of our customers as opposed to trying to avoid bill increases in the short term which then drives a large bill shock in 2030.

278. Our submission showed that the notional firm would not be financeable in 2028/29 and 2029/30 with the additional expenditure from the cost change process (including for the Bran Sands long sea outfall under the large scheme gated process), and our delivery plan now shows that we expect to catch-up with our capex expenditure versus allowances in the same two years. This makes it likely that in-period revenue will be needed to support financeability of the notional firm ahead of the 2030 end of period true up mechanism and perhaps in 2028. Indeed, in our letter to Ofwat we

[39] https://www.ofwat.gov.uk/wp-content/uploads/2024/12/7.-PR24-final-determinations-Delivering-outcomes-for-customers-and-the-environment-1.pdf
[40] https://www.nwg.co.uk/globalassets/business-plan-2025-30/nesltds.pdf p112
[41] https://www.gov.uk/government/publications/storm-overflows-discharge-reduction-plan

suggested that revenue would likely be needed in 2029/30 rather than as part of an end of period true-up mechanism as set out in the DD.

279. We also explained that there was still uncertainty in some of the forecasts. In particular, there are still three more projects in the large scheme gated process that will require further funding in those two years – although it is not yet certain how much would fall into AMP8, and how much into AMP9. We have seen an increase in demand from growth and may need to increase our expenditure in response.

280. Whilst we are not requesting in-period revenue at this time we propose to return to this issue as the investment period progresses and as part of any future cost change rounds. We would welcome feedback on this approach from Ofwat.

8. SUMMARY OF CHANGES SINCE INITIAL SUBMISSION

281. This section is a summary of the changes we have proposed across this cost change submission. In particular, we include changes to our additional investments, AMP8 base plan for boreholes and what base buys estimate for gravity sewers in section 8.1. As a result of these changes, we include updated final requested cost tables after implicit allowance and maintenance savings in section 8.2 . Finally, our annual profiles for the additional investments have been updated to take into account most recent cost and profiling capability information (see section 8.3).

8.1. CHANGES TO INVESTMENT LINES

282. Regarding additional investments, we have revised the scope and therefore costs of our service reservoirs, boreholes and settlement tanks as described in the figure below. Scope and costs for water towers, trickling filters and gravity sewers remain unchanged.

FIGURE 42 - CHANGES TO ADDITIONAL INVESTMENTS (£M, 2022/23 PRICES)

Asset	Change item	Original submission	DD response	Change	Reason for change
Service reservoir	Land purchase	0.761	0.165	-0.597	We added land purchase costs for Auton Stile, Ryhope and Stoneygate in error in the original submission. We have now removed land purchase cost for those 3 sites in our request as discussed in section 4.1.3.3
Service reservoir	Risk & uncertainty	23.799	23.561	-0.239	Land purchase is part of project overheads, the reduction in this cost also leads to reduction in risk and estimating uncertainty.
Borehole	Benhall 4	2.215	0	-2.215	We did a review of the condition of our bores after the May submission and this review identified that Benhall 4 is out of scope so we have removed it (see paragraph 200).
Borehole	Felkington 1	0.179	4.335	4.156	After the original submission, we did a survey and uncovered a more severe situation so we have changed the preferred solution from refurbishment to drilling a new borehole (see section 4.4.3)
Settlement tank	Washington STW	13.079	9.809	-3.270	Ofwat excluded the 4th tank at Washington STW as it's not been in use. We accept this challenge as the 4th tank is not as critical for replacement now as the other 3 tanks (see section 3.3).
Total		**40.035**	**37.870**	**-2.165**	

Source: NWL analysis

283. Regarding our base plan for AMP8, we have removed the out of scope items for boreholes as described in the figure below. There are no changes to the base plan for other assets.

FIGURE 43 - CHANGES TO AMP8 BASE PLAN FOR BOREHOLES (£M, 2022/23 PRICES)

Site	Original submission	DD response	Change	Reason for change
Stifford	0.971	0	-0.971	Ofwat excluded Stifford due to it being out of scope, we have reviewed the scope and accept the challenge
Benhall 1	1.192	1.192	0	No change

Site	Original submission	DD response	Change	Reason for change
North Dalton	3.982	2.460	-1.522	Ofwat excluded this as it was out of scope. We have removed the out-of-scope elements and request funding for the in-scope elements (see section 3.2)
Felkington	0.074	0	-0.074	Ofwat excluded these as they started in AMP7, we disagree with this reason. However, we have removed them as they are not material (see paragraph 45)
Rickinghall	0.055	0	-0.055	
Sunderland	0.009	0	-0.009	
Wells and Bores Minor works North	0.725	0.752	0	No change. Ofwat excluded this as it considers this standard reactive maintenance. We disagree with this reason. This programme is for small-scale refurbishment and replacement of the priority assets and is therefore in scope (see paragraph 45)
Wells and Bores Minor works South	1.708	1.708	0	
Total	**8.715**	**6.085**	**-2.630**	

Source: NWL analysis

284. For gravity sewers, as the implicit allowance has increased from £37.7m to £66.8m, the length of sewer rehab already funded from base increases too, from 66.5km to 117.9km using our unit cost for the base plan of £556/m[42]. We ask that Ofwat uses the revised figures to set appropriate PCDs in its FD.

FIGURE 44 - CHANGE TO WHAT BASE BUYS ESTIMATE FOR GRAVITY SEWER REHABILITATION (£M, 2022/23 PRICES)

Change item	Original submission	DD response	Change	Reason for change
WBB (£m)	37.7	66.8	29.1	We accept the use of expenditure approach for gravity sewer rehabilitation and have updated our WBB estimate using this approach (see section 2)
WBB length (km)	66.5	117.9	51.4	Due to change in WBB estimate

Source: NWL analysis

8.2. FINAL COSTS

285. As a result of the changes made across our submission, the tables below outline our final requested cost for each area, including service reservoirs and water towers (Figure 45), boreholes (Figure 46), settlement tanks (Figure 47) and gravity sewer rehabilitation (Figure 48).

FIGURE 45 - UPDATED REQUEST COST FOR SERVICE RESERVOIRS AND WATER TOWERS (£M, 2022/23 PRICES)

	Capex
Additional investment	84.2
AMP8 base plan	27.5
Implicit allowance	16.5
Maintenance savings	0.6
Total request	94.7

Source: NWL analysis

[42] Our unit cost for the base plan is stated in Figure 23 of the gravity sewer investment case submitted in May 2026, https://www.nwg.co.uk/globalassets/business-plan-2025-30/june26/nes---asset-health-investment-case---gravity-sewers.pdf

FIGURE 46 - UPDATED REQUEST COST FOR BOREHOLES (£M, 2022/23 PRICES)

	Capex
Additional investment	49.0
AMP8 base plan	6.1
Implicit allowance	1.8
Maintenance savings	0
Total request	53.3

Source: NWL analysis

FIGURE 47 - UPDATED REQUEST COST FOR SETTLEMENT TANKS (£M, 2022/23 PRICES)

	Capex
Additional investment	28.7
AMP8 base plan	8.5
Implicit allowance	10.0
Maintenance savings	0
Total request	27.2

Source: NWL analysis

FIGURE 48 - UPDATED REQUEST COST AND LENGTH OF GRAVITY SEWER REHABILITATION

	Capex (£m, 2022/23 prices)	Length of sewer rehab (km)
Additional investment	111.5	172.0
AMP8 base plan	72.5	128.0
Implicit allowance	66.8	117.9
Maintenance savings	0	0
Total request	117.2	182.1

Source: NWL analysis

8.3. CHANGES TO OUR ANNUAL PROFILE OF ADDITIONAL INVESTMENTS

286. In addition to the changes to our request costs as outlined in section 8.1, we have also made changes to the spend profile. Our Assets Programme Management Office is continuing to strengthen schedule and financial profiling using intelligence from comparable work types and evolving pulse-rate assumptions to improve investment confidence, delivery readiness, and affordability insight. The new profiles therefore better reflect this increasing maturity, alongside emerging cost intelligence, greater scope definition, internal and supply chain capacity, capability constraints, and opportunities for earlier mobilisation.

287. Figure 49 compares the original profile and the updated one. Specifically, there are 3 main changes:

- We have extended slightly the delivery timescales for some of the investments for water towers and trickling filters. For gravity sewers and settlement tanks, investments have been brought forward. This is mainly due to better information mentioned above.
- The original profile for all additional investments starts from 2027/28. We now plan to release early funding for network storage, boreholes, trickling filters and settlement tanks in 2026/27 which will help with mobilisation.

- We have also added a small amount of spend in 2033/34. However, this does not change the original delivery date of our projects. It is common for costs to still be incurred against projects which are substantially completed and are in service and are delivery benefits to our customers. Examples of these types of costs are post commissioning optimisation, site demobilisation, landscaping and reinstatements, compensation settlements, asset records and information updates and where appropriate removal of redundant assets. It's prudent to recognise this and although the benefits to customers are being delivered, we still have some run on costs to fully close out the projects.

FIGURE 49 – ORIGINAL VS DD RESPONSE ANNUAL EXPENDITURE PROFILE (%)

Area	2027	2028	2029	2030	2031	2032	2033	2034
SR original		8%	17%	17%	18%	18%	22%	
SR DDR	0.7%	8%	17%	17%	18%	18%	22%	0.14%
WT original		9%	33%	57%				
WT DDR	0.6%	9%	34%	34%	22%			
BH original		8%	18%	19%	18%	17%	21%	
BH DDR	0.6%	8%	17%	17%	18%	18%	21%	0.16%
TF original		24%	32%	32%	4%	4%	5%	
TF DDR	0.1%	22%	30%	30%	9%	4%	5%	0.04%
ST original		19%	26%	31%	7%	7%	10%	
ST DDR	0.2%	20%	28%	28%	11%	6%	7%	0.03%
GS original		26%	33%	40%				
GS DDR		30%	35%	35%				

Note: SR is service reservoir, WT is water tower, BH is borehole, TF is trickling filter, ST is settlement tank, GS is gravity sewer.
Source: NWL analysis on annual profile of additional investments.

288. We provide the updated cost change data table with the new profiles alongside this submission[43].

[43] NES-CCP-DDR-07 - Cost-change-process-data-tables-September-2026.