

UUWR_86

PR24 Draft Determination: Enhancement Case

PR24 Draft Determination: Bunbury - Enhancement Case

August 2024

This document sets out the service enhancement expenditure and activity that we will undertake through AMP8 and supports our draft determination response documents, UUWR_75 and UUWR_77.

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Enhancement submission				
Title:	UUWR_86_Bunbury WwTW			
Price Control:	Ww Network +			
Enhancement headline: <i>One or two sentences summarising the headlines</i>	Enhancement expenditure to deliver improvements to Bunbury WwTW to meet the needs of the AMP8 WINEP following the inclusion of deliverables on a new version of the WINEP issued on the 5 July 2024.			
Enhancement expenditure (FY23 prices)		AMP8 Capex inc TI (£m)	AMP8 Opex (£m)	AMP8 Totex (£m)
	Pre RPE and Frontier Shift	1.7	0.000	1.7
	Post RPE and Frontier Shift	1.7	0.000	1.7
	<p>The table above shows the total expenditure on both a pre-efficiency (i.e. pre frontier shift and real price effects basis, consistent with the cost data tables), and a post efficiency and RPE basis (i.e. consistent with the value we propose to be recovered from price controls). All numbers referenced hereafter in this enhancement case are on a pre efficiency and RPE basis.</p>			
This case aligns to :	<p>UUWR 77 New WINEP</p> <p>Expenditure relating to this case can be found in data tables: CWW3.64-66 and CWW3.73-75, CWW19 and ADD17.</p>			
PCD	Yes			

1. Enhancement case summary

Gate	Summary	Location reference
Need for enhancement investment	<p>Our base expenditure only covers the cost of meeting the current Environmental Permit requirement. This enhancement investment is driven by the following statutory drivers:</p> <ul style="list-style-type: none"> The Water Environment (Water Framework Directive) Regulations 2017 	Section 3
Best option for customers	<p>We have undertaken an exercise to identify the most cost effective way of meeting the need and the likely future permit requirements associated with that solution.</p>	Section 4
Cost efficiency	<p>To ensure robust and efficient costs in our programme we have used an estimating approach based on data collected over a number of AMPs (AMP3 to AMP7) updated to reflect present market conditions under which we and the UK Water Industry are operating. We have reviewed our costs against industry data.</p>	Section 5
Customer protection	<p>Customers are protected from non-delivery through the following ODIs:</p> <ul style="list-style-type: none"> Discharge permit compliance ODI – if we fail to deliver improvements to our discharges on time we would expect the Environment Agency to issue permits for our preferred solution which we would fail to achieve. <p>Additional consequences of non-delivery include:</p> <ul style="list-style-type: none"> Prosecution and fines due to non-compliance with permits Reputational impact of reducing Environmental Performance Loss of trust with customers and stakeholders Loss of trust with the Environment Agency leading to less support for innovative approaches to delivering environmental improvement 	Section 6
Price Control Deliverable	<p>Price control deliverables applied to this enhancement case:</p> <ul style="list-style-type: none"> Phosphorus removal 	Section 6

2. Introduction

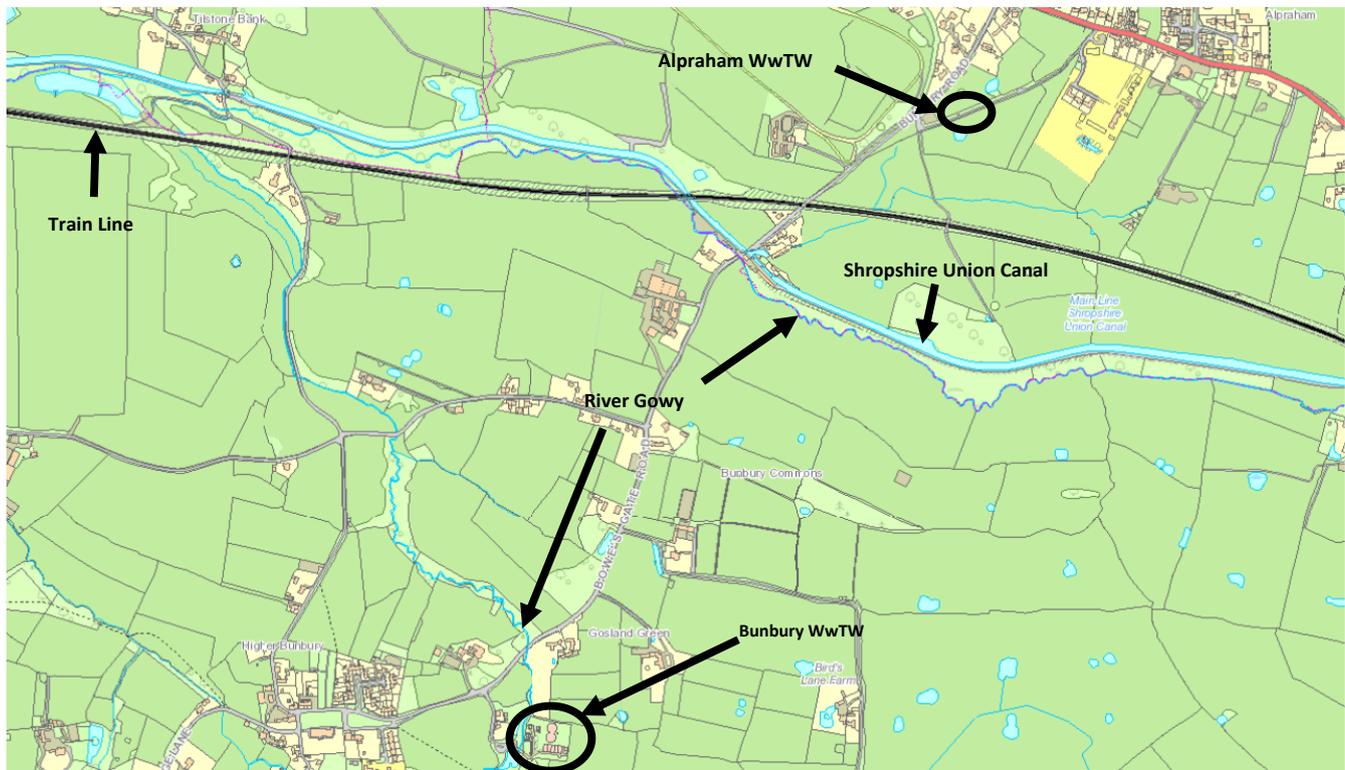
- 2.1.1 This document sets out the enhancement case for an additional £1.7m totex to allow UW to deliver improvements to Bunbury WwTW as a result of new drivers being included in the AMP8 WINEP.**
- 2.1.2 This enhancement case covers Bunbury WwTW which has been included in the WINEP since our initial business plan submission in October 2023. Details of other changes to the WINEP are summarised in [UUWR 77 New WINEP](#).
- 2.1.3 The development of the WINEP has been informed by the key regulatory guidance including; the WINEP methodology, WINEP options development guidance, WINEP options assessment guidance, WINEP driver and supporting guidance. Our approach reflects the specific context within which we operate in the North West of England.
- 2.1.4 The Environment Agency included Bunbury WwTW in the WINEP issued on the 5th July 2024 under WFD_IMPg driver to reduce spill frequency by the 31st March 2030. This was triggered following a review by the Environment Agency of the solution at Alraham WwTW to meet the U_IMP1 driver which was included in the October 2023 business plan submission.
- 2.1.5 The costs contained within this enhancement case are only those associated with meeting the new drivers at Bunbury WwTW.

3. Need for enhancement investment

3.1 Background

- 3.1.1 In our business plan submission in October 2023, a scheme was included at Alpraham WwTW which had been included in the WINEP submission with an Urban Wastewater Treatment Regulation driver (U_IMP1). The population served by Alpraham WwTW had exceeded 250 which is a threshold for improvement in the regulations.
- 3.1.2 As solution development for Alpraham evolved it was identified that the location of the outfall was not to the River Gowy as anticipated but to the Shropshire Union Canal. On the back of this the Environment Agency, reviewed what the appropriate environmental standards would be.

Figure 1 Locations of Alpraham WwTW and Bunbury WwTW



Alpraham WwTW discharges to the Shropshire Union Canal and it is proposed to move this discharge to the River Gowy to meet the U_IMP1 driver. Bunbury WwTW discharges to the River Gowy downstream of the proposed discharge site for Alpraham WwTW.

- 3.1.3 Further modelling work and discussion identified the need to add additional drivers to the WINEP action to further improve the quality of the effluent being discharged from Alpraham but those drivers and limits then became dependent on whether the discharge location remained into the canal or whether it was moved to the River Gowy.
- 3.1.4 Optioneering work was undertaken, using proposed limits derived from this modelling and shared with the Environment Agency, which resulted in our preferred and lowest cost solution, that of moving the discharge from Alpraham WwTW to the River Gowy, being included in our October 2023 Business Plan submission. However, the formal release of the WINEP on the 25th September, 2023 did not include these permit limits.
- 3.1.5 In October 2023 we provided our modelling work to the Environment Agency to support the inclusion of the permit limits within the WINEP. Following the Environment Agency review of this information, they requested we include more modelling scenarios which eventually resulted in a further tightening of the

permit limits that we would need to meet. This further modelling work also showed that to ensure the discharge into the River Gowy did not cause environmental damage, a further improvement in the quality of the effluent being discharged from Alpraham would be needed as well as an additional driver at Bunbury WwTW.

- 3.1.6 Bunbury WwTW discharges downstream of the proposed outfall location for Alpraham WwTW in the River Gowy (Figure 1).

3.2 Environmental need

- 3.2.1 This section details the environmental driver and legislation which supports the need for this investment and our approach to addressing these requirements.
- 3.2.2 The Environment Agency included Bunbury WwTW in the WINEP issued on the 5 July 2024 under WFD_IMPg driver for delivery by 31 March 2030. This has been triggered by the preferred solution for addressing the U_IMP1 driver at Alpraham WwTW.
- 3.2.3 The development of the WINEP has been informed by the key regulatory guidance including; the WINEP methodology, WINEP options development guidance, WINEP options assessment guidance, WINEP driver and supporting guidance. Our approach reflects the specific context within which we operate in the North West of England.
- 3.2.4 The proposed solution at Alpraham WwTW to meet the U_IMP1 driver resulted in the Environment Agency further tightening discharge limits at Alpraham WwTW and including an additional driver at Bunbury in the WINEP to meet expectations of The Water Environment (Water Framework Directive) Regulations 2017 in the River Gowy.
- 3.2.5 Bunbury WwTW has been included with a WFD_IMPg driver to reduce the phosphorus limit from 0.4mg/l to 0.25mg/l.

3.3 Customer support

- 3.3.1 Customer research indicates protecting the environment is a key priority in the North West. Research for DWMP identified that 76% of customers said, 'protecting lakes, rivers, reservoirs, fish and other aquatics plants and wildlife is really important to me'. This was also echoed by our PR24 research where customers identified that they wanted UUW to go further with our plans for addressing pollution and also requested area specific interventions to tackle local issues, more details can be found within our PR24 supplementary document Affordability and Acceptability Testing Research UUW22.
- 3.3.2 United Utilities Water (UUW) holds a library of customer insights for projects we have delivered within AMP 7 (currently in progress from 2020 – 25). Each insight and research project has used an appropriate method to capture a variety of customer and stakeholder opinions, ensuring a representative view of the diverse customer base across the North West. This insight has been incorporated in to the options development and selection process undertaken. Further information can be found in the UUW's WINEP approach to WINEP development and our insight and research library.

3.4 Management control

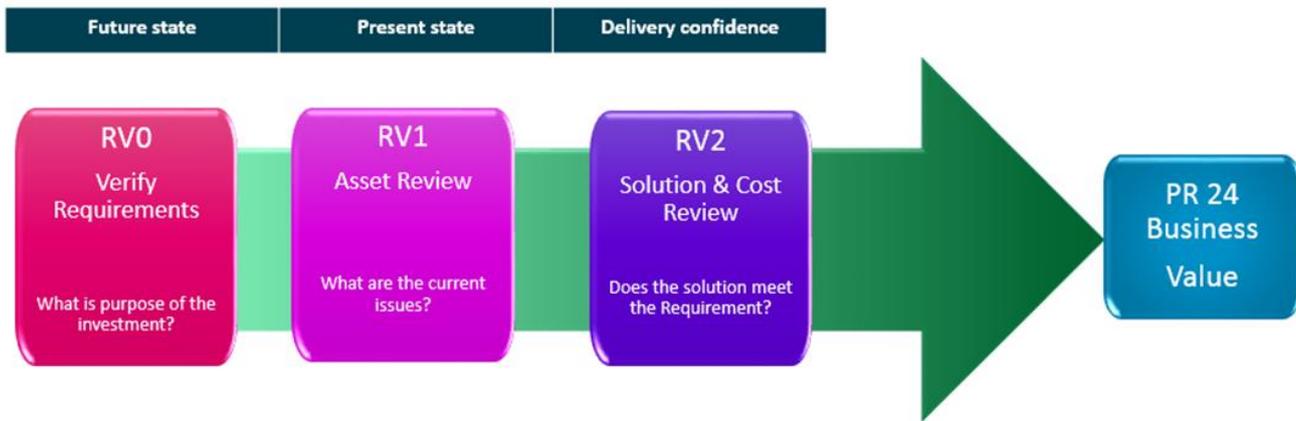
- 3.4.1 Statutory enhancements to performance included in the WINEP are outside of management control. Base totex allowance maintains compliance with current permits. To enable compliance with new, more onerous permits, investment to enhance current assets or to deliver new assets is required. Bunbury WwTW was identified by the Environment Agency and included within the updated WINEP issued on the 5 July 2024, as such it did not form part of our October 2023 business plan submission.

4. Best option for customers

4.1 Approach to options development

4.1.1 PR24 options development followed the fundamental principles of the UUW defined value management process. Risk and Value for PR24 (RV) was a three stage process (Figure 2), aimed at positively challenging our projects to ensure we have sufficient evidence behind decisions. It provides UUW with confidence that we are proposing the right projects for the AMP8 Programme and therefore managing and maximising the value for customers from their investments. It also ensures that we adopt the correct approach to option identification, development and selection to maximise the realisation of benefits associated with these investments.

Figure 2: PR24 Risk and Value approach



- 4.1.2 The development of a solution for Alpraham WwTW for the business plan submission in October 2023 fully followed this approach. Due to the late addition of Bunbury WwTW to the WINEP , we have not been able to fully assess the requirements and develop interventions through the standard process and a condensed approach was taken.
- 4.1.3 In developing the best solution for Alpraham, a number of solutions were considered including multiple discharge locations. This required a number of modelling runs to understand the different permeations and solution development for each of these This included looking at the costs and benefits for delivering a solution discharging to the Shropshire Union Canal and the costs and benefits for delivering a solution to the River Gowy. This identified that the best value solution overall was to discharge to the River Gowy and to meet the additional drivers this would trigger at Alpraham and Bunbury WwTW.
- 4.1.4 High level screening was applied to refine the feasible solutions and determine solution development and estimating. In developing feasible options the engineer will always have taken which solution could represent the best value to the customer into consideration.
- 4.1.5 A standardised methodology to solution identification was developed for the wastewater treatment works solutions to ensure a consistent approach. Elements from the ‘Process Decision Support Tool’ that cross references permit values, population and flow data with United Utilities’ treatment processes and asset standards to identify and size interventions to meet the requirements were applied. Consideration of interventions included conventional (including chemical and biological phosphorus removal), innovative and nature based solutions.
- 4.1.6 Use of these optioneering tools ensured the process was proportionate to the scale of the risk to be addressed and the timescale given to develop solutions. They provided a quick and effective way of ruling out unsuitable options and identifying feasible solutions from different option types.

4.2 Options development for Bunbury WwTW

- 4.2.1 Following inclusion of Bunbury WwTW on the WINEP, the requirement for a tighter phosphorus permit to the technically achievable limit was reviewed and confirmed.
- 4.2.2 Following this confirmation a review was conducted of the existing assets. There is an ongoing AMP7 scheme at Bunbury to deliver a solution to meet a driver on the AMP7 WINEP of 0.4mg/l phosphorus so it was also important to understand the proposed solution for this scheme.
- 4.2.3 The delivery of the AMP7 scheme also provided useful context about how the site was performing and highlighted potential issues with delivering a low phosphorus solution. In particular it identified that pH was likely to be an issue in achieving 0.25mg/l phosphorus.
- 4.2.4 Within the options development process, an un-constrained series of potential options were identified against a list of 'Generic High Level Solutions' (GHLS) categories as per the standard PR24 processes. This identified one feasible option and this is the preferred solution. The preferred solution consists of an additional ferric dosing point, feed pump and mixer for ferric prior to the tertiary solids removal plant and provision of caustic dosing.

4.3 Innovation

- 4.3.1 Throughout AMP7 United Utilities has undertaken rapid learning from the deployment of AMP6 innovation (such as that demonstrated with Nereda and Typhon) and has developed a new Technology Approval Process. This process identifies opportunities for innovative technologies and nature-based solutions. It provides a methodical approach to due diligence, innovation risk identification and mitigation planning. The approved technologies and solutions include:
- those we have identified directly
 - those suggested by our construction partners
 - those identified by other WaSCs but not yet progressed by United Utilities in AMP7 i.e. I-PHYC Algal bioreactors
 - global innovation insights such as that secured through our engineering service provider Jacobs and other consultants such as Stantec.
- 4.3.2 Our Technology Approval Process has allowed us to progress technologies into approval without the need to trial, for example the Mobile Organic Biofilm technology approved and now in detailed design and construction for our Macclesfield AMP7 scheme. This approach highlights our credentials as a fast adopter of new technology but with deeper awareness of the innovation risks that need to be managed.
- 4.3.3 To develop our PR24 submission we have incorporated the technologies that have now secured 'approved' status in our Process Decision Support Tool which was used to identify innovation opportunities by driver and site details. Where these innovation opportunities present the best value solutions they have been selected to be taken forward as the preferred solution. For storm overflows, we have maximised the amount of SuDS solutions put forward as the preferred option, and we continue to seek opportunities to deliver more value for customers.
- 4.3.4 When assessing this, if the value of these novel solutions cannot be determined with sufficient certainty, they have been identified as an opportunity for UuW to pursue in the period between submission and delivery. Alongside this we will continue to review those innovations / solutions not yet approved but relevant to AMP8 drivers, and progress these through our Technology Approval Process.
- 4.3.5 UuW is also leading a trial in this area through the Ofwat Innovation Fund. The Mainstreaming Nature-Based Solutions programme¹ seeks to bring together multi-sectoral expertise and leadership to collaboratively create and test new solutions to surface water management. This is being delivered

¹ <https://waterinnovation.challenges.org/winners/mainstreaming-nature-based-solutions/>

through real-life case studies to facilitate and enable the transition of nature-based solutions into business as usual, to deliver greater value for customers, society and the environment. This will enable the exploration of lower cost options for nature-based solutions to deliver wider environmental outcomes and include customers in decision making which we can feed into our AMP8 plans.

- 4.3.6 We believe this sets UUW in good standing to understand the key opportunities that innovation can deliver within our PR24 submission and enables further efficiency driven by our innovation programme.

5. Cost efficiency

5.1 Introduction

5.1.1 This section sets out how we have calculated the value of this enhancement case, how we have challenged our assumptions to develop efficient costs and how these have been benchmarked and assured.

5.2 Approach to cost build

5.2.1 Costs for Bunbury have been assessed using location specific information. Due to combining the delivery of the solutions for the inlet overflow and the storm tank overflow significant efficiencies have been realised relative to the previous arrangement of delivering a solution to the inlet overflow in AMP8 and the storm tank overflow in AMP9.

5.2.2 Post submission of the original business plan we have continued to develop our approach. We appointed Jacobs as our Strategic Solution Partner in early 2024, and since then we have been working with their global experts to leverage advancements in technology and identify efficiencies in this catchment solution.

5.2.3 To develop robust and efficient costs we have used an estimating approach based on data collected over a number of AMPs (AMP3 to AMP7), updated to reflect present market conditions under which we and the UK water industry are operating. We have partnered with Mott Macdonald who provide us and other UK water and sewerage companies with an estimating service, which allows them to provide a benchmarked approach to our PR24 capital cost estimates.

5.2.4 Our Investment Programme Estimating System (referred to as the PR24 Estimating Database / IPES) is an in-house estimating tool which is used to provide costs for the Price Review and scheme development. The system is a robust repository for data from previous AMP periods, which sits alongside estimated data, to allow us to develop project and programme estimating.

5.2.5 Mott MacDonald has provided us with a specialist estimating function utilising costing data derived from our construction data, which supports our scheme estimates. Post business plan submission, to give us additional confidence that our cost estimates produced by Mott MacDonald were accurate, we undertook a self-assurance exercise by appointing ChandlerKBS. We asked ChandlerKBS to price up a selection of our projects using their Cost Intelligence Database (CID). ChandlerKBS are an international commercial company who have provided estimating services to a number of UK infrastructure businesses, including a number of water companies. Their CID contains data derived from their clients over 20 years, including tens of thousands of cost curves and capital projects.

5.2.6 The outcome of this review was that an overall variance of 3% against the Mott MacDonald estimate shows a close level of correlation and gives us confidence in the costs we have developed for our schemes. This was backed up by the output report: "The overall ChandlerKBS estimate total for the fourteen projects is 3% lower than the UU PR24 estimates. ChandlerKBS consider the UU PR24 estimates to be comparable with our industry cost data" (ChandlerKBS 2024).

5.2.7 We commissioned Arup to run an independent scrutiny and challenge process on the development of the PR24 WINEP prior to the development of the integrated solution for Staveley. Arup spent time working with specialists across UUW to understand how we had arrived at the scope, the approach to developing costs and whether the programme had been appropriately optimised.

5.2.8 Feedback from Arup was that 'Overall, we note the very significant amount of work that was done by UUW in the short time between our reviews... We found that UUW responded positively to the challenge and scrutiny applied to it from Arup and the Panel members, with a very significant amount of work undertaken after our initial review. We observed that progress had been made by UWW in many areas that we highlighted in our original review. As part of this, we also noted a strong push across the

leadership and the operational teams on trying to ensure that the programme achieves a balance of solutions across traditional engineered approaches and alternative solutions where these are feasible and appropriate.’

- 5.2.9 Following the initial review by Arup we incorporated their feedback into our plan and process for developing solutions. Particularly relevant to this case is the cost estimating methodology which following the second review they concluded that UW costing methodologies largely comply with the requirements of WINEP guidance as well as standard industry practice. However, they did raise concern that “across a broad programme the level of risk allowance is at the lower end of the range we would expect’ we have further developed our plan to ensure concerns raised are addressed within the final estimates.
- 5.2.10 We have run internal cost challenge processes since the 5th July ’24 WINEP, but a full cost challenge and assurance has not been possible in the time available.

5.3 Benchmarking UW’s capital costs

- 5.3.1 In July 2024 United Utilities commissioned Mott MacDonald to carry out a benchmarking exercise of United Utilities major capital construction costs.
- 5.3.2 The benchmarking of costs between companies is a challenging task, as such costs are often commercially sensitive, and are not readily shared. The sharing of out-turn costs could affect market competition between contractors and suppliers.
- 5.3.3 Mott MacDonald provide engineering and capital delivery services to three UK water and waste water companies, and were able to determine the costs incurred by those companies in the delivery of their major capital programme. United Utilities costs were compared to the other two water and waste water companies (whose identity was not revealed to United Utilities, and who were referred to as “Benchmark 1” and Benchmark 2”) and the outcome of this comparison was shared.
- 5.3.4 United Utilities provided cost breakdowns for high value construction projects, for use in the benchmarking exercise. The comparable project costs included elements such as materials, construction costs, and so on.
- 5.3.5 The benchmarking exercise found that all companies were most expensive for some line items, and least expensive for other line items.
- 5.3.6 When comparing all of the most expensive line items from across the three companies, and all of the least expensive line items (the max of maxs, and min of mins), United Utilities costs were 18% below the max of max, and 19% above the min of mins.
- 5.3.7 Looking at overall average costs, United Utilities was 2% above Benchmark 1 costs, and 3% below Benchmark 2 costs, with an average variance of 1%.
- 5.3.8 This indicates that United Utilities costs are comparable to other companies in the sector, and that we are not high cost outliers. We will continue to work with contractors and partners to secure cost efficiencies as we move into the delivery phase of the programme.

5.4 Third party assurance of our cost estimates

- 5.4.1 UUW put in place a robust process to identify, scope and cost all solutions proposed within our business plan. This process is set out in detail in October's main business plan submission^[1] along with supporting supplementary documents^[2].
- 5.4.2 This process was subject to third party assurance during the development of our business plan. Full details of UUW's approach to assuring our business plan was set out in our October submission^[3]. As set out within this submission, a number of third party organisations were involved in providing assurance including Deloitte, PWC and Faithful & Gould.
- 5.4.3 UUW's Board provided assurance that the solution development process underpinning our plan was appropriate, included extensive optioneering and that resulting expenditure forecasts were robust and efficient^[4].
- 5.4.4 The scope and associated costs set out within this enhancement case have been developed using the same process described and assured in the above documents. This enhancement case has also set out specific evidence to support the unique aspects of this particular investment proposed. As such, we consider this to represent compelling evidence that the forecasted costs set out within this case are robust and efficient.

^[1] UUW (2023) *UUW08: Delivering at efficient cost*. Available here:

https://www.unitedutilities.com/globalassets/z_corporate-site/pr24/main-documents/uuw08.pdf

^[2] UUW (2023) *UUW45: Our approach to best value totex*. Available here:

https://www.unitedutilities.com/globalassets/z_corporate-site/pr24/supplementary-documents/uuw45.pdf

^[3] UUW (2023) *UUW76: Confidence and assurance of the submission*. Available here:

https://www.unitedutilities.com/globalassets/z_corporate-site/pr24/supplementary-documents/uuw76.pdf

^[4] UUW (2023) *UUW11: Board Assurance Statement*. Available here:

https://www.unitedutilities.com/globalassets/z_corporate-site/pr24/main-documents/uuw11.pdf

6. Customer protection

6.1 Introduction

- 6.1.1 It is important that customers have confidence that we will deliver the enhancement schemes that get reflected in our PR24 final determinations and they are suitably protected in the event of non-delivery, or if there are material changes to deliverables (including changes to dates), which leads to a change in cost (including changes in the timing of required expenditure). Ofwat proposes that, if companies fail to deliver or are late delivering improvements to customers, then price control deliverables (PCDs) should, where appropriate, be used to compensate customers. In our PR24 *Chapter 8 – Delivering at Efficient Cost, section 8.8.9* we have proposed an approach to PCDs that aims to provide customer protection, such that customers are fairly compensated for non-delivery (such as due to a change in regulatory requirements) or late delivery (including as a result of a change to a regulatory date), between PCDs, any related ODI underperformance payments, and cost sharing arrangements.
- 6.1.2 For enhancement requirements that have been added to the WINEP post submission of our PR24 plan, we propose that they should be incorporate within the relevant price control deliverable (PCD).
- 6.1.3 For Bunbury WwTW we believe the following PCD should be updated to reflect the new additional enhancement requirement:
- Phosphorus removal
- 6.1.4 Further details of this can be found in [UUWR 33 Phosphorus removal](#) and CWW19.

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