

UUWR_80

PR24 Draft Determination: Enhancement Case

Water WINEP Enhancement cases

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. This document includes our enhancement cases for Blea Water, Yearl Weir and Naden Gauging Weir.

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Enhancement submission				
Title:	UUWR_80 Water WINEP additional enhancement cases			
Price Control:	Water Resources			
Enhancement headline: <i>One or two sentences summarising the headlines</i>	<p>Since the submission of our business plan in October 2023, three new Water WINEP projects have been identified. These new projects are expected to appear in the final AMP8 WINEP due for publication in September 2024.</p> <p>This business case outlines the case for the costs associated with delivering the 3 newly identified projects.</p>			
Enhancement expenditure (FY23 prices)	Additional Water WINEP	AMP8 Capex inc TI (£m)	AMP8 Opex (£m)	AMP8 Totex (£m)
	Pre RPE and Frontier Shift	18.113	4.994	23.107
	Post RPE and Frontier Shift	17.749	4.985	22.734
	<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). <i>All numbers referenced hereafter in this enhancement case are on a pre efficiency and RPE basis.</i></p>			
This case aligns to :	<p>UUWR 77 WINEP</p> <p>Expenditure relating to this case can be found in data tables CW3.7-9,19-21 and 31-33.</p>			
PCD	Yes			

1. Enhancement case summary

Following the submission of the our main business plan on 2 October 2023 and the receipt of the new WINEP from the Environment Agency on 5 July 2024, three additional WINEP projects have been identified. These projects represent important environmental schemes which have regulatory drivers and delivery dates. These new projects are therefore included in this addendum to our Water Resources Business Case from our October 2023 business plan document UUW_60, to reflect the funding to enable delivery of these regulatory requirements.

The three WINEP projects identified are new, discreet projects for AMP8. Two have arisen as a result of developments with projects undertaken in AMP7 (Blea Water and Yearl Weir). In these cases, the relevant AMP7 projects have seen significant increase to scope and scale, due to input from regulators. This has necessitated an extended period of investigation and feasibility / constructability assessment, and a prolonged period of regulatory approval. In both cases, the AMP7 projects are being amended through the Environment Agency formal alteration process, to become investigation only projects (with driver SSSI_INV for Blea Water and HD_INV for Yearl Weir).

The results of these investigations and studies will inform the construction phase of the project, which will take place in AMP8. The construction phase will be regulated via two entirely new implementation projects (SSSI_IMP & WFD_IMP), which we have proposed for the final edition of the AMP8 WINEP. The alteration and creation process for the existing AMP7 and new AMP8 projects was formally initiated in June 2024, and represents an extended period of negotiation with regulators over several years. We have received verbal agreement from the Environment Agency for these changes, and we expect these 3 projects to be part of the final WINEP as published in September 2024.

In addition to the proposed two new implementation projects, an additional investigation project has been identified for delivery in AMP8. The requirements for this project were identified during a site visit by the Environment Agency to a United Utilities catchment area in summer 2024, post the submission of the business plan.

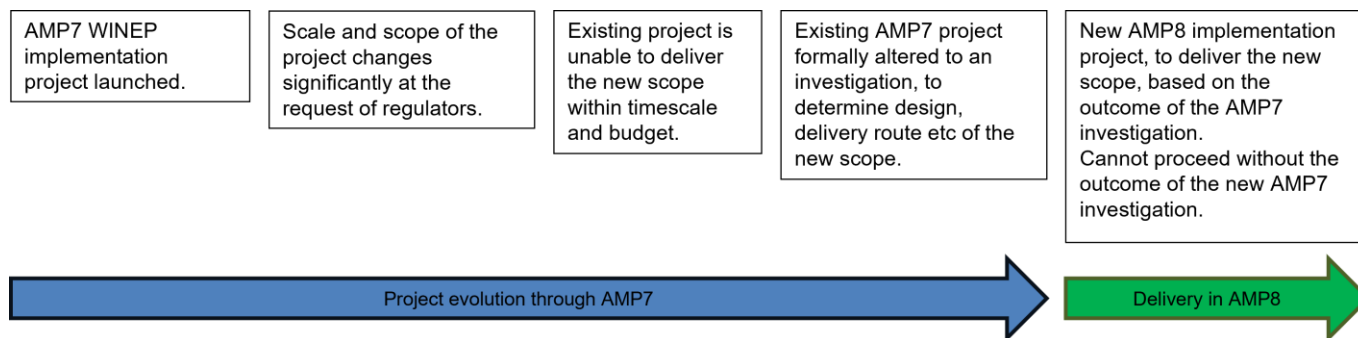
The additional WINEP Lines are shown in Table 1 below;

Table 1: New Water WINEP projects since business plan submission

Name	Description	Driver	Cost	Delivery
Blea Water	The removal of a weir in the upland catchment surrounding Haweswater, following the identification of an appropriate delivery solution in AMP7. WINEP ID 08UU101394b.	SSSI_IMP	£4.994m (100% Opex)	03/2027
Yearl Weir	Removal of a weir and the remediation of the surrounding area to provide sustainable geomorphological process and effective fish passage, following the identification of an appropriate solution in AMP7. WINEP ID Pending	WFD_IMP	£18.062m (100% Capex)	03/2030
Naden Gauging Weir	New investigation into the role of this weir in acting as a barrier to fish passage. WINEP ID 08UU102499a.	WFD_INV_PHYS	£0.051m (100% Capex)	04/2027

The Naden gauging weir project is entirely new. The evolution of both of Yearl Weir and Blea Water projects is shown in Figure 1 below:

Figure 1: Evolution of Yearl Weir and Blea Water throughout AMP7 and AMP8



Blea Water

Gate	Summary	Location reference
Need for enhancement investment	<ul style="list-style-type: none"> Blea Water is a lake located in a SSSI in the English Lake District. The only barrier to the SSSI achieving ‘good’ status is the presence of a weir, which creates an artificial shoreline for the lake. A WINEP investigation project is underway this AMP to develop a detailed method for the removal of the weir. This is needed given the difficult terrain and highly protected nature of the site. An AMP8 WINEP implementation project has been created to deliver the weir removal, following the method established by the AMP7 investigation. 	<p>3.1.1</p> <p>3.1.6</p> <p>3.1.7</p>
Best option for customers	<ul style="list-style-type: none"> A variety of construction and access methods have been considered for this project. We have applied the learning from our similar (but more mature) project at Overwater to act as a template for this project. 	<p>4.1.5</p> <p>4.1.7</p>
Cost efficiency	<ul style="list-style-type: none"> A detailed cost breakdown is provided of the estimated costs associated with the AMP8 WINEP project. These costs have been subject to independent 3rd party benchmarking, and we also provide details of our strategic company approach to achieving efficiency during the delivery of the capital programme. 	<p>5.1.5</p> <p>Appendix B</p>
Customer protection	<ul style="list-style-type: none"> Customer protection will be ensured through an existing Price Control Deliverable mechanism. Please see DD representation document UUWR 32 – Water WINEP for details of that PCD. 	<p>6.1.1</p>
Price Control Deliverable	<p>Yes</p>	<p>6.1.1</p>

2. Introduction

- 2.1.1 Blea Water is an oligotrophic corrie lake located in the East of the Lake District, within the uplands comprising the South-West catchment of Haweswater Reservoir. The lake is close to the top of High Street mountain, and lies 250m vertically above the surrounding terrain, surrounded by steep slopes which are close to vertical in places.
- 2.1.2 Figure 2 below shows the area surrounding Blea Water, with the steep slopes of High Street mountain visible above and below the lake.

Figure 2: Blea Water



- 2.1.3 The natural lake drains via Mardale Beck. In the early 20th century, the lake was artificially deepened through the installation of a weir across Mardale Beck, which increased the depth of the lake by approximately 1m. The purpose of the weir was to provide sufficient depth for a water intake pipe. This intake provided a water supply for a small number of properties (principally the Haweswater Hotel) located at the foot of High Street mountain. The weir was constructed through the use of manual labour, with materials being taken to the site by wheelbarrow, along narrow mountain paths, and with the concrete for the weir being hand mixed and laid on site. Such construction practices are no longer permitted under modern Health and Safety regulations.

3. Need for enhancement investment

- 3.1.1 During AMP7 WINEP development Natural England requested the removal of the weir, in order to re-naturalise the landscape and enhance the SSSI status of the site. The project was formerly the subject of an AMP7 implementation scheme, with the driver SSSI_IMP. Natural England considered that the process for removal of this relatively small structure would be straightforward and could be adequately costed and scoped without an investigation. This represents a significant deviation to standard practice, where suitable investigation project is carried out to identify an engineering solution prior to implementation.
- 3.1.2 The Measure Specification form states: *“UU’s preferred approach would normally be to undertake an investigation in AMP7 to identify and cost a preferred solution to dam removal which would then be undertaken in AMP8. However, during AMP7 WINEP development, Natural England considered that the process for removal of this relatively small structure is straightforward and can be adequately costed without an investigation. This is because the weir is a small structure being about 1 metre high with a spillway 3-4 m wide with small retaining walls on either side. The site can be accessed by machinery, and the volume of material to be removed is not excessive and could be flown out by helicopter at a relatively low cost. An assessment of the impact downstream of dam removal (undertaken by Natural England) shows that with staged dam removal there should be no significant effects on receiving water bodies”.*
- 3.1.3 During the design phase of this project, it has become evident the site access and demolition of the weir and surrounding infrastructure will be more challenging than anticipated. Specifically preliminary site access assessments have identified significant risks pertaining to on-site engineering challenges including site access limitation, significant health & safety risks and a non-negligible risk of environmental damage. Access for construction machinery at ground level cannot be achieved without the construction of an extensive ‘switchback’ style roadway, up the face of the mountain. This would pose severe environmental risk, and risk of landscape detriment, and could only be achieved through extensive blasting and excavation of the mountainside. Similarly, United Utilities explored the use of heavy lift helicopters, to take construction machinery in pieces to the weir site, and assembly of the construction material in-situ. Investigation of this option revealed that, again, extensive blasting / excavation works would likely be needed in order to facilitate a safe helicopter landing zone near the weir.
- 3.1.4 Access and implementation challenges are further compounded as the location of Blea Water is within the Blea Water SSSI, Lake District National Park and UNESCO World Heritage Site.
- 3.1.5 Site access for construction machinery, is now therefore the most challenging aspect of this project, and securing regulatory approval for enabling works represents the most significant step in delivery of the project. This represents a significant change in the scope of the project, and impacts the timescales and delivery options associated with the project. Developing a regulator approved access and working method is now an essential first step in the process.
- 3.1.6 For this reason, United Utilities has formally initiated the WINEP change control process, to change the AMP7 project at Blea Water from an SSSI_IMP (Implementation) project to an SSSI_INV (Investigation) project, with a revised scope to achieve regulator approval for access and working arrangements. In addition, to fully deliver the environmental obligations, United Utilities has added a new AMP8 SSSI_IMP project, to deliver the weir removal phase (according to the method to be agreed via the AMP7 SSSI_INV project). This approach was discussed with the Environment Agency.
- 3.1.7 United Utilities submitted change control notices to the Environment Agency in March 2024. The WINEP published in July 2024 accepted this change, with the project appearing as: 08UU101394b Blea weir – removal, SSSI_IMP.
- 3.1.8 WINEP projects are regulatory obligations which water companies are required to complete.

4. Best option for customers

- 4.1.1 The fundamental issue with regard to the Blea Water SSSI site is the artificial water level in the lake, (directly caused by the presence of the weir), which causes the shoreline of the lake to be higher than would be the case based on the geomorphology of the lakes’ basin. The artificial shoreline (the presence of the weir) is the only feature preventing the SSSI being classified at ‘good’ status.
- 4.1.2 The 2020 Measure Specification Form for the AMP7 investigation project noted that *“The most recent Natural England condition assessment of the ‘standing open water’ feature of the site (dated 27th July 2017) is ‘unfavourable – no change’. The adverse condition reasons given are “freshwater - inappropriate weirs dams and other structures”. It is noted by Natural England that the dam is affecting the representation of the natural shoreline.”*
- 4.1.3 In negotiations with Natural England, the regulator offered the view that only removal of the weir, and re-naturalisation of the lake shoreline, would enable the SSSI to be classified at ‘good’ status. This requirement placed significant constraints on the ability of United Utilities to apply alternative approaches, or natural catchment-based solutions.
- 4.1.4 The Action Specification Form for the AMP8 implementation project states *“The action is to remove the redundant weir at Blea Water, utilising the solution identified during AMP7 WINEP Project (7UU200486). This will restore natural hydrological functions and aid restoration of the SSSI to favourable condition. This will also be beneficial to the upstream reaches of WFD river water body Haweswater Beck, directly downstream of the weir.”* Again this limits the opportunity for alternative options regarding the project.
- 4.1.5 One area where United Utilities was able to explore a variety of options concerned the deliverability and construction methods used in the project. A wide range of options was considered, and these are set out in Table 2. The options considered all encountered challenges regarding access, and general working conditions in the harsh mountainous location where the weir is sited.

Table 2: Optioneering for Blea Water

AMP7 Project investigations – Machinery and equipment	
Project Name:	Blea Water IR – Weir Removal
Project Number:	U. 80061994
Site / Batch:	Blea Water IR
Review Author:	Rebecca Holmes
Project Partnership Officer:	John Gorst
Executive Summary	
<p>There are elements of the access and demolition works scoped by Stonbury that are not possible without significant environmental damage to the montane environment and Blea Water SSSI. These elements are detailed in the following report.</p> <p>The current proposed access and demolition works will require the following additional requirements over and above that originally assumed during the discussions that informed the WINEP Measures Specification Form:</p> <ol style="list-style-type: none"> 1. Significant uplift in the current budget. 2. Planning permission for laydown areas and compounds at Mardale Head and Blea Water. 3. Planning permission for an access track from Mardale Head to Blea Water. 4. Environmental Impact Assessment. 5. Significant importation of stone to provide level compound and working areas. 6. Cutting into the rock next to Blea water to create a level compound area. 7. Cutting into the slopes in several areas from Mardale Head to Blea Water to create the access track. 	

- 8. Larger size and power of equipment and machinery (5t) required to break the existing concrete weir and associated infrastructure. (A 1-2t excavator would also be unstable in the terrain around Blea water).
- 9. Availability of suitable helicrane to lift the machinery and equipment.
- 10. Gantries required to disassemble and reassemble machinery (which also require compound areas).

Construction Difficulty (Red, Amber, Green)



Current construction constraints

The size of machinery required to break the concrete weir and cut through the reinforcement would require a track to access the site. Heli-cranes to lift this size of equipment are not available in the UK. Lifting machinery via heli-crane would require a gantry at either end of the lift to disassemble and rebuild the machinery.

In order to use helicranes (or any large helicopters) we would need a flat landing site. This is not currently available at Blea water and so a flat landing area would have to be created through cutting into the bedrock and using hardcore to level the area. This would cause permanent damage within the SSSI.

Dan Thomson (UU Construction Engineer) received advice that the maximum standard heli lift in UK is 1.8 tonnes (£220/hour). American aircraft are available which permit 4-4.5 tonnes. These craft require 6 people to operate and 3 months mobilisation and demobilisation.

Using explosives would need careful management and the use of blast mats (to protect the surrounding area from debris www.blastmat.com). Blast mats (maximum size 3.2m x 7m, weight 1300kg) would need to be transported to site either via a track or heli-lifting.

There is no / limited phone reception within the valley and satellite phones should be utilised for emergency communications and a backup of long-range radios for communication from the base compound to the satellite compound.

A comprehensive Emergency and Contingency plan would need to be developed to ensure the safety of the workforce.

The natural landscape is a UNESCO world heritage site and therefore any excavations / works / tracking in the natural environment would need special permissions.

Further Investigations:

- 1. RSPB – proposed to work jointly with Clark Dillon Architects and Building surveyors (<http://clarkdillon.co.uk/index.html>) to undertake the works however after further investigation it became apparent that Clark Dillon don't have similar experience nor do RSPB have demolition experience.
- 2. Costain – Dan Thomson, UU Construction Engineer approach Costain (UU Construction framework partners) who advised that equipment needed to break out and remove the weir would require construction of a road and compounds to access the site and carry out the works.
- 3. CAN Ltd, specialist geotechnical and structural services and part of the RSK group (www.can.ltd.uk) was approached to explore the use of expanding grout to break the weir. We approached CAN Ltd as they have carried out the rockface stabilisation and containment work for UU at Rough Crag, Thirlmere. CAN Ltd passed the request to a sub-contractor – cbec (www.cbecoeng.co.uk). cbec eco-engineering provide specialist consultancy to projects in the water environment in geomorphology, hydrology and hydraulics. Neither of these companies appear to have demolition experience. Cbec have completed weir removal projects but not in environments with similar access issues to Blea Water:

4. The Mezi muck spider excavator is extremely versatile and can work in water up to 1.7m deep while using biodegradable hydraulic fluid to protect water. The 4 large tyres and bucket are the only point that touch the ground and does not damage the ground like a tracked machine. The Menzi has two fuel tanks enabling the work to go longer between refuelling, which is important when working on remote, steep or environmentally sensitive sites. Its telescopic extending boom allows for extra-long reach which reduces the need for the machine to move, consequently reducing ground disturbance. Exc@v8 Group are plant, forest and cableway engineers who are the sole supplier of Menzi muck in the UK (www.excavators-uk.com) they do not currently have an excavator that would be suitable for demolition of the weir.
5. Simon Webb, NE provided details of a company in the Lake District who use walking excavators <https://www.facebook.com/terrafirmaenvironmentalltd/>. Terrafirma (www.tfeltd.co.uk) undertake restoration and ecological conservation work. When contacted they advised they would not be able to provide equipment or expertise to support the Blea water weir removal project. Simon also provided details of the company that Fix the Fells use for heli lifts <https://pdgaviationservices.com/fleet> their fleet includes a helicopter with 4 tonne lifting capacity but not 5 tonne.
6. Review of companies using Menzi muck excavators included the two companies below from the UK. They carry out river restoration, forestry, embankment and erosion stabilisation, although none undertake demolition work. The remainder of the companies I found were overseas and also did not undertake demolition work.
7. <https://www.salixrw.com/case-studies/>
8. www.ground-control.co.uk

- 4.1.6 Given the optioneering challenges, United Utilities sought to minimise the costs and delay that might be encountered in this phase of the project. We applied the experiences and lessons learned from another similar project, and applied those to the Blea Water project.
- 4.1.7 United Utilities have another, entirely separate, weir removal scheme scheduled for AMP8, at Overwater (project 08UU100152 HD_IMP). Overwater is a similar project, that involves weir removal in a heavily regulated and protected habitat, and where there are significant access issues including terrain and 3rd party rights. The structure to be removed at Overwater is very similar to the structure at Blea Water. Overwater is a lake of 542 million litres volume, and with a weir that is 18.89m wide, whereas Blea Water is a lake of 545 million litres volume, with a weir that is 19.38m wide.
- 4.1.8 The project at Overwater has previously been the subject of an AMP7 investigation. As a result, the Overwater project is more mature than the Blea Water project, and has already considered access arrangements, regulatory approvals, 3rd party negotiations, and other potential challenges to delivery. The results of the AMP7 investigation at Overwater have enabled us to develop a detailed methodology for the removal of the weir, which we have been able to cost estimate with precision. Please see October 2023 business plan document *UUW_60 - Water Quality Enhancement Cases*, Table 13 pg. 58 for the detailed breakdown of the cost estimation for the Overwater weir removal in AMP8. Figure 3 shows the similarities between Blea Water and Overwater.

Figure 3: Similarities in weir structure between Blea Water (left) and Overwater (right)



5. Cost efficiency

- 5.1.1 The optioneering exercise for Blea Water revealed that the project was going to necessarily include the development of access arrangements and working facilities, which were not initially considered to be significant issues at the start of AMP7. These new project elements comprise a substantial increase in scope compared to a simple weir removal project.
- 5.1.2 The significant increase in scale and scope of the project poses a challenge to costs. Our October 2023 business plan document UUW_60 Water Quality Enhancement Cases, (Section 6, pg. 38 “cost efficiency”), describes the cost assurance process for existing WINEP projects. This includes the principle in section 6.16 that *“A bottom-up estimating approach ensured bespoke cost build-ups with itemised elements for each scheme based on site specific information. Item elements were costed based on a combination of contractor framework rates, estimator judgement, historical outturn costs from previous projects, and cost curves where available.”*
- 5.1.3 Given the similarities between these projects, it is considered appropriate to utilise the mature cost estimate for Overwater as an indicator of costs for the project at Blea Water. In full consideration, Blea Water represents a more challenging location for construction, as Overwater does not have the same level of access difficulty, nor does it experience the weather and extreme elevation that Blea Water experiences. Nonetheless, we intend to use the Overwater project as a guide, revealing opportunities and risks, and providing learning that will be directly applied to the Blea Water project.
- 5.1.4 Our drive towards greater efficiency will continue into the tender process and contract award phases of the project. A detailed statement on United Utilities approach to managing capital investment and engineering procurement is provided in Appendix A.

5.1.5 Table 3 below shows the cost build-up for the Blea Water project.

Table 3: Blea Water project costs

Component cost line items	Component costs
Access and compound	£341,355
Temporary roadway	£195,939
Removal of weir direct activity cost	£149,135
Sandbagging / damming for working area	£41,571
Removal of demolished material	£261,455
Excavation of pipework / ducting	£223,577
Access dust suppression and grit removal	£146,679
Hardstandings	£33,168
Underground chamber works	£22,376
Valve removal	£12,822
Pipework and headwall removal from site	£33,257
Material removal other costs (licences, disposal etc)	£184,893
Environmental restoration	£2,603,248
UU surveying	£91,119
UU engineering	£227,931
UU other services (land management, overhead etc)	£372,011
Insurance, compensation events etc	£53,350
Total	£4,993,886.50

The Environmental Restoration action relates to our obligations under Schedule 7A of the Town and Country Planning Act 1990 (as amended by Schedule 14 of the Environment Act 2021). Where planning applications are submitted to change the environmental conditions of a designated site, the applicant has an obligation to ensure that there is a 'net gain' in biodiversity of +10% or more for 30 years or longer, according to DEFRA endorsed biodiversity assessment criteria.

5.1.6 Costs associated with major capital Water WINEP projects have been subject to 3rd party benchmarking, the results of which are shown in Appendix B to this document.

Third party assurance of our cost estimates

5.1.7 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].

5.1.8 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.

^[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

- 5.1.9 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].
- 5.1.10 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.

^[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

- 6.1.1 Ofwat have ensured customer protection through the application of a Price Control Deliverable mechanism, covering the AMP8 Water WINEP. In the Ofwat Draft Determination document “Water-WINEP-PCDs”, worksheet “Biodiversity-UUW” United Utilities were specifically requested to provide additional details regarding the operation of the PCD. We will provide that additional detail in our main Draft Determination Water WINEP representation document.
- 6.1.2 Customer protection will be ensured through the main Water WINEP PCD described above.

Yearl Weir

Gate	Summary	Location reference
Need for enhancement investment	<ul style="list-style-type: none"> Yearl Weir is a structure in the River Derwent, which is a special area of conservation. The weir acts a barrier to fish migration, and prevents natural geomorphological processes. There was an AMP7 WINEP project regarding the removal or modification of the weir. United Utilities proposed a variety of methods for accomplishing this, none of which achieved regulatory approval. The AMP7 project was then changed into an investigation project, to determine a solution that would be approved by the various regulators involved. The AMP7 investigation identified a new solution (a perturbation fish pass) which achieved regulatory agreement late in AMP7. An AMP8 WINEP implementation project has been created to deliver the installation of the perturbation fish pass. 	<p>7.1.1</p> <p>8.1.2</p> <p>8.1.2</p> <p>8.1.5</p>
Best option for customers	<ul style="list-style-type: none"> A large number of options have been considered around the design and construction of the fish pass an geomorphology supporting structures. Only one solution achieved regulatory approval. 	<p>9.1.1</p> <p>0</p>
Cost efficiency	<ul style="list-style-type: none"> A detailed cost breakdown is provided of the estimated costs associated with the AMP8 WINEP project. These costs have been subject to independent 3rd party benchmarking, and we also provide details of our strategic company approach to achieving efficiency during the delivery of the capital programme. 	<p>10.1.1</p> <p>Appendix B</p>
Customer protection	<ul style="list-style-type: none"> Customer protection will be ensured through an existing Price Control Deliverable mechanism. Please see our DD response document UUWR 32 – Water WINEP for details of that PCD. 	<p>11.1.1</p>
Price Control Deliverable	<p>Yes</p>	<p>11.1.1</p>

7. Introduction

7.1.1 Yearl Weir is a large Victorian structure located in the River Derwent at Workington, Cumbria. The weir creates a 'step' in water level, that would otherwise be characterised by a series of rocky rapids. The weir was constructed to create a pool upstream of the structure, from which United Utilities abstracts water, and provide a non-potable supply to a major industrial customer. The weir is the first 'obstacle' in the river, when travelling upstream from the sea, and so acts as a barrier to fish migrating further up the catchment. The project deliverable relating to Yearl Weir requires the removal of the weir and re-naturalisation of the river course, with the aim of restoring natural geomorphological processes and enabling fish passage. Figure 4 is a photograph looking north, along the line of Yearl Weir. The image shows the considerable length of the structure.

Figure 4: Yearl Weir, on the River Derwent, Workington, Cumbria



8. Need for enhancement investment

- 8.1.1 During AMP7 Yearl Weir was originally the subject of a HD_IMP project, aimed at delivering removal of the weir. During the design phase of the project, United Utilities proposed numerous designs and methods for the delivery of the project (see “Best Option for Customers” below).
- 8.1.2 The Yearl Weir project is a complex scheme with multiple site constraints, and is the subject of interest of multiple regulators. During AMP7, United Utilities has proposed multiple designs for improved fish passage at the weir. Each of those designs successfully delivered either the fish passage requirements (regulated by the Environment Agency), or the geomorphological improvements (regulated by Natural England), but no design satisfied both criteria simultaneously. In mid-2024 the Environment Agency identified a solution which had been successfully adopted in the Midlands region, where a similar impasse between fish passage and geomorphology had occurred.
- 8.1.3 The identified solution is a perturbation fish-pass, and requires the construction of an artificial river bed, including structures influence flow to create eddies and currents, promoting geomorphological processes whilst enabling fish to pass upstream. Figure 5 shows an existing perturbation fish pass constructed on the upper River Severn.

Figure 5: Perturbation fish pass on the River Severn



- 8.1.4 The original fish pass design (cost estimated and scheduled at PR19) was the construction of a comparatively simple opening in the weir. As can be seen from the image above, the proposed perturbation fish pass is a solution with greater scope - requiring extensive civil engineering works in-river. Effectively, this solution requires the creation of an artificial riverbed over 100m of the river. This new solution could not be delivered within the timescale, and budget of the original AMP7 project. Indeed, construction could not begin without a detailed design phase, including constructability

assessments, 3rd party land negotiations, regulatory approvals (including planning permissions) and additional project preparation.

- 8.1.5 For this reason, in June 2024 United Utilities has formally initiated the WINEP change control process, to change the AMP7 project at Yearl Weir from an HD_IMP (Implementation) project to an HD_INV (Investigation) project, with a revised scope to achieve design, constructability assessment and regulatory approval. In addition, to fully deliver this environmental obligations, United Utilities has added a new AMP8 WFD_IMP project, to deliver the construction phase (according to the method to be agreed in AMP7).

9. Best options for Customers

9.1.1 During the design phase of the original AMP7 project, a large number of design options were considered. Table 4 shows a summary of the options.

Table 4: Optioneering for Yearl Weir

Options Considered	Feasibility	Additional Information
Do nothing	Rejected	Doesn't meet requirements and therefore not considered
New Fish-Pass in weir	Rejected	Discounted due to modelling results being inconclusive for location and doesn't provide wider geomorphological benefits. Would also require on-going sediment management
Utilise & refurb existing fish pass downstream channel maintenance	Rejected	Discounted due to modelling results being inconclusive for location and doesn't provide wider geomorphological benefits. Would also require on-going sediment management
Multiple fishpasses	Rejected	Discounted due to modelling results being inconclusive for location and doesn't provide wider geomorphological benefits. Would also require on-going sediment management
New fishpass & utilise / refurb existing fishpass	Rejected	Discounted due to modelling results being inconclusive for location and doesn't provide wider geomorphological benefits. Would also require on-going sediment management
Bypass channel external to weir	Rejected	Rejected by all due to high risk of creating hotspot for poaching and can create a number of H&S / guarding / access issues. Doesn't provide wider geomorphological benefit.
Rock ramp - short notch 3m x 30cm	Rejected	Rejected as does not satisfy full requirements of the MSF. Does not improve geomorphology downstream.
Rock ramp - long notch 3m x 30cm	Rejected	Rejected as does not satisfy full requirements of the MSF. Does not improve geomorphology downstream.
Rock ramp - background flow	Rejected	Rejected as does not satisfy full requirements of the MSF. Does not improve geomorphology downstream.
Rock ramp - background flow to Mill Stream	Rejected	Rejected as does not satisfy full requirements of the MSF and unable to maintain supply to industrial user.
Rock ramp flow to maintain UU abstraction at minimum pump level	Rejected	Rejected as does not satisfy full requirements of the MSF and unable to maintain supply to industrial user.
Full weir removal	Rejected	Largely rejected due to significant impact to UU Barepot Intake and associated Mill Race impacts and affects other abstraction points
Partial weir removal plus new fish pass	Rejected	No suitable location for fish pass and doesn't provide wider geomorphological benefit.
Provide alternative abstraction solution	Rejected	Jacobs report stated a 20 - 40% likelihood chance of success. Solution only confirmed if viable upon completion. Risk too high.
Perturbation Fish Pass	Selected	

9.1.2 The only proposal that obtained regulatory approval, was the perturbation fish pass proposed by the Environment Agency.

9.1.3 The outcome of the AMP7 design and feasibility study will enable construction in AMP8. This solution is dissimilar to any has previously undertaken United Utilities project, and therefore we have no in-house historic costs on which to base a cost estimate. The United Utilities project team engaged with our River Restoration Framework suppliers (who have extensive experience of in-river civil engineering projects) to estimate costs of this project. Given the complex nature of the project, the full costs were estimated to be £18.062m.

10. Cost Efficiency

10.1.1 The United Utilities River Restoration Framework Supplier carried out a bottom up estimate of costs for the Yearl Weir perturbation fish pass project. The costs are shown in Table 5.

Table 5: Build up of costs for Yearl Weir

Component cost line items	Component costs
Access road	£613,482
Excavation of level working surface for new river bed	£2,158,082
Sheet piling and coffer dam to enable in river working	£718,873
Material to form perturbation fish pass bed and walls	£4,115,137
Filling and landscaping area behind existing weir	£641,196
Raising level of existing weir	£435,641
Sluice modification for the Mill Stream	£561,125
Footpath diversion	£216,334
UU services (engineering, overhead etc)	£6,601,493
Risk, insurance, compensation events etc	£2,000,425
Total	£18,061,814.58

10.1.2 Our drive towards greater efficiency will continue into the tender process and contract award phases of the project. A detailed statement on United Utilities approach to managing capital investment and engineering procurement is provided in Appendix A.

10.1.3 Costs associated with major capital Water WINEP projects have been subject to 3rd party benchmarking, the results of which are shown in Appendix B to this document.

11. Customer protection

- 11.1.1 Ofwat have ensured customer protection through the application of a Price Control Deliverable mechanism, covering the AMP8 Water WINEP. In the Ofwat Draft Determination document “Water-WINEP-PCDs”, worksheet “Biodiversity-UUW” United Utilities were specifically requested to provide additional details regarding the operation of the PCD. We will provide that additional detail in our main Draft Determination Water WINEP representation document.
- 11.1.2 Customer protection will be ensured through the main Water WINEP PCD described above.

Naden Gauging Weir

Gate	Summary	Location reference
Need for enhancement investment	<ul style="list-style-type: none"> Naden Gauging Weir is a structure located on Cheeseden Brook, a tributary of the River Roch, in Greater Manchester. 	12.1.1
	<ul style="list-style-type: none"> The Environment Agency have identified Naden Gauging Weir as a potential barrier to fish passage. This was determined during an Environment Agency site visit in summer 2024. 	12.1.2
	<ul style="list-style-type: none"> An AMP8 WINEP investigation project has been created, to determine whether the weir acts as a barrier to fish migration, and whether a weir modification / removal project may be required in AMP9. 	12.1.2
Best option for customers	<ul style="list-style-type: none"> The weir is a non-operational structure. The only alternative to carrying out the WINEP AMP8 investigation is to proceed straight to weir modification / removal. The high costs of proceeding straight to construction, the comparatively modest cost of the investigation, and the high uncertainty as to whether the weir is a barrier to fish (meaning a high possibility that no modification will be required) means that it is beneficial to carry out the investigation (rather than proceed directly to construction). 	13.1.1 13.1.2
Cost efficiency	<ul style="list-style-type: none"> Costs are built on standard unit rates for 3rd party consultants carrying out investigations of this kind. 	14.1.1
Customer protection	<ul style="list-style-type: none"> Customers are protected via the overarching cost reconciliation mechanism. 	15.1.1
Price Control Deliverable	No (below materiality threshold).	N/A

12. Introduction

- 12.1.1 The Naden gauging weir (Figure 6) is a pair of concrete structures which are built into the bed of Cheeseden Brook, a stream which flows from our Ashworth Moor impounding reservoir, in the Naden Valley Western Catchment. The Naden valley was formerly home to a number of spinning mills, and other industrial concerns. The gauging weirs were intended to enable the accurate measurement of river flow (against graded markers) to ensure that the operators of Ashworth Moor reservoir (the Rochdale Corporation Water Board at time of construction) were releasing sufficient water for use by the mills in the valley. The mills ceased operation in the mid-20th century, and the Naden valley is now an entirely rural location, used for sheep and dairy farming. There are no industrial abstractors in the Naden valley downstream of Ashworth Moor reservoir. However, the gauging weir legacy assets remain in place, as there has never been an imperative reason to remove them.
- 12.1.2 In June 2024 the Environment Agency confirmed that they now required an assessment to be undertaken, to determine whether the gauging weir is acting as a barrier to fish migration. This requirement was identified by the Agency late in the process of WINEP development, after our previous business plan was submitted. The project is included here as an addition to the water WINEP.

Figure 6: Naden Gauging Weir



13. Best option for customers

- 13.1.1 The Naden gauging weir has been identified as a barrier to fish passage by the Environment Agency, and an investigation project has been added to the WINEP by the Agency. The only options for United Utilities is to carry out the investigation as instructed, or (given that the weir is a redundant asset) move straight to demolition of the weir.
- 13.1.2 The cost of investigations is relatively modest (see below) whereas the cost of weir removal schemes can be significant (hundreds of thousands or millions of pounds, see October 2023 business plan document *UUW_60 - Water Enhancement Cases* supplementary document, Appendix C page 116 for details).
- 13.1.3 Cheeseden Brook is located high in the catchment of the River Roch. There are numerous obstacles to fish migration between Naden Gauging Weir and the sea. The investigation is required to verify whether the Naden Gauging Weir plays any role in acting as a barrier to fish migration, at this point high in the catchment.
- 13.1.4 The uncertainty of whether a weir removal project will be required in future AMPs, and the modest cost of investigations, led United Utilities to opt for an investigation in AMP8, in preference to moving straight to weir removal.

14. Cost efficiency

- 14.1.1 During AMP7 United Utilities undertook several investigations into the impact of weirs as a barrier to fish migration. Two of those investigations (Hug Bridge Weir, and Taxal Gauging Weir) relate to structures which are very similar to the Naden Gauging Weir. Naden Gauging Weir is an in-river structure with a total length of 14m. By comparison Hug Bridge Weir is also 14m in length, and Taxal Gauging Weir is 11m in length. Both the Hug Bridge investigation, and the Taxal investigation, both cost £51k as a final out turn cost, which was comprised of 3rd part consultant fees associated with the fish counts, hydro-ecological modelling, in-river flow monitoring, and report production associated with those projects. This is a standard unit rate fee for a fish barrier investigation relating to a structure of this size and type. It is therefore forecast that the new investigation project at Naden Gauging Weir will cost £51k .
- 14.1.2 It is not possible to provide a detailed cost break-down table for this project (such as has been provided for Blea Water and Yearl Weir) as the £51k is a single line item cost, which represents the cost of commissioning a 3rd party consultancy to carry out the investigation.
- 14.1.3 Our drive towards greater efficiency will continue into the tender process and contract award phases of the project. A detailed statement on United Utilities approach to managing capital investment and engineering procurement is provided in Appendix A.

15. Customer protection

- 15.1.1 Customer protection will be ensured through the cost reconciliation mechanism. This project is below the materiality threshold for a Price Control Deliverable mechanism.

Appendix A United Utilities approach to capital investment

At Price Review stage, the United Utilities Commercial, Engineering and Capital Delivery department will review the capital investment programme to determine the typical type, size, value and complexity of solutions required for the assets to be renewed or maintained across the water and wastewater infrastructure and non-infrastructure programme to ensure the procurement strategy is fit for purpose to deliver an efficient programme.

We will then review the procurement strategy to determine what type of commercial construction, supply, engineering and consultancy frameworks need to be procured to ensure that UU has the most appropriate partners in place to deliver the capital programme below budget and to the right timescales.

Each framework will go through a rigorous procurement process so that each of the bidders commercial/value, technical, health and safety, relevant experience and staff CV's can be assessed and scored, to ensure that the Framework partners chosen will have demonstrated through a competitive process, their proven technical expertise and efficient commercial pricing.

In addition, when these framework partners are utilised, dependent on the need, then they will either undergo a further mini-competition through the framework or they will price a single source solution, but in either approach their pricing levels will be in accordance with their competitive framework pricing levels, and they will be checked and validated against the UU independent internal estimate, and challenges will be made as necessary to ensure commercial value is maximised and technical compliance.

If the framework approach is not appropriate for any project, UU also procures direct to the market where it seeks competitive tenders from a range of suppliers/contractors and allows market forces to ensure a competitive price is obtained. These are also validated against the UU independent internal estimate.

Once the Contract has been awarded to the successful bidder, the contract is rigorously managed by the UU project team in accordance with the Contract. The UU Project Manager, Quantity Surveyor, Construction Supervisor and Engineering representative will ensure that any additional variations are kept to a minimum and valued appropriately, all costs and payments are in accordance with the contract and the contractor is being monitored on site to ensure efficient delivery of construction plant and equipment and to UU specification and standards.

Each project will be audited by UU's cost assurance consultants to ensure that only legitimate costs are paid.

Final accounts at the end of each project are agreed timely and there is a clear escalation process to deal with any disagreements or disputes by use of senior representatives.

UU continuously seeks lessons learnt to improve efficiency in future processes and seeks innovation to continuously improve leaner solutions and ways of working.

Appendix B Third party benchmarking of United Utilities costs

In July 2024 United Utilities commissioned Mott MacDonald to carry out a benchmarking exercise of United Utilities major capital construction costs.

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.

Mott MacDonald provide engineering and capital delivery services to 3 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 2 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.

United Utilities provided cost breakdowns for high value construction / demolition water WINEP projects, for use in the benchmarking exercise. Mott MacDonald found that certain elements of these projects (particularly relating to environmental protection measures) were site specific, and did not scale with the size / value of the project. These site specific elements of the project were discounted from the exercise, and 49% of the overall project costs were benchmarked. The comparable project costs included elements such as materials, construction costs, and so on.

The benchmarking exercise found that all companies were most expensive for some line items, and least expensive for other line items.

When comparing all of the most expensive line items from across the 3 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.

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%.

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 (see Appendix A for details of our approach to capital investment).

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