UUWLGS_P1S2_01 Windermere

Windermere: Package 1

Submission 2 – Solution Delivery Plan

December 2025

United Utilities

Water for the North West

Contents

1. Executive Summary

1.1.1 UUW is investing at Windermere in AMP8. Several investments are already funded through Ofwat's final determination (FD) and a further 12 projects are going through Ofwat's large schemes gated process. These projects comprise phosphorus, sanitary and storm overflow schemes.

1.1.2 This submission sets out UUW's proposed solution delivery plan for six of the schemes going through the gated process – package one. Package one comprises a set of phosphorus and sanitary schemes to achieve tight phosphorus permits for WINEP drivers with 2030 regulatory dates. Four of these are at small treatment works (Troutbeck, Outgate, Near Sawrey and Far Sawrey), with phosphorus drivers also at the larger treatment works at Grasmere and Ambleside.

1.1.3 In line with the PR24 Large Schemes Approach Guidance, this submission sets out UUW's proposed definition of scheme, cost allowances and price control deliverables (PCDs). It is designed to provide the information required by Ofwat to review and approve access to funding for delivery of the six schemes. It builds on submission one in October 2025, which set out the progress of scheme design and feasibility assessments, and incorporates Ofwat feedback on submission one and further discussions at the December 2025 quarterly review meeting.

1.1.4 Since submission one, we have continued to develop the schemes and in line with the requirements for submission two we have:

- Engaged with relevant stakeholders (including customers), and agreed our plans with key stakeholders including the Environment Agency;
- Developed final outline designs, finalised feasibility, pre-planning investigations and procurement strategy;
- Completed pre-planning investigations and planning application, where appropriate;
- Finalised detailed costs for the schemes, which are set out with benchmarking to ensure efficiency;
- Set out a proposed (PCD for the delivery phase, taking into account feedback from Ofwat;
- Set out the strategy and delivery plan for the proposed schemes;
- Identified a supply chain partner; and
- Updated the risk register setting out the remaining risks to scope, programme and costs.

1.1.5 A summary of the solutions for each scheme and updated totex are set out in the table below. Since submission one, we have carried out a series of safety, maintenance and operability reviews which have led to revisions in solution design. One of the primary drivers is a need for increased power resilience to mitigate impacts of power failures, which has led to a need for further land and planning permissions, and consequential changes in programme. We have also reviewed commissioning periods based on more recent experience at Troutbeck. As a result, while our programmes now reflect proceeding to delivery without waiting for the outcome of Ofwat's cost change process, construction durations are longer, with completion dates three to six months ahead of submission one.

1.1.6 The changes in design and extended programmes, coupled with a small number of other scope and programme development changes, have led to an increase in costs for package on compared to previous estimates. Nevertheless, the costs remain within Ofwat's modelled allowances and are efficient. The higher costs offer improved power resilience, and are consistent with a greater maturity of the package one schemes and resolution of some of the cost uncertainty highlighted in submission one.

Table 1: Solutions summary (£m, 2022/23 CPIH prices))

Project	Proposed solution	Submission 1 totex	Submission 2 totex	Change in totex
Submission chapter	*3*	*5*	*5*	*5*
Troutbeck WwTW – phosphorus and sanitary	Provide additional treatment with a FujiClean system and Tertiary Solids Removal (TSR)	3.8	4.6	0.8
Outgate WwTW – phosphorus and sanitary	Provide additional treatment with a FujiClean system and TSR	3.5	4.4	0.9
Near Sawrey WwTW – phosphorus and sanitary	Provide additional treatment with a FujiClean system and TSR	4.2	5.8	1.6
Far Sawrey – phosphorus and sanitary	Provide additional treatment with a FujiClean system and TSR	3.0	4.5	1.5
Grasmere WwTW – phosphorus	Ferric dosing control enhancement	0.04	0.10	0.06
Ambleside WwTW – phosphorus	Ferric dosing control enhancement	0.1	0.24	0.13

Source: Summarised from submission chapters

1.1.7 The next stage in the project lifecycle is detailed design, which we expect to complete for Troutbeck and Outgate in May, and for Near and Far Sawrey in August 2026. We expect to start on site first at Troutbeck and Outgate, both in June 2026. The Grasmere and Ambleside projects will also both start on site in 2026, in Q2 and Q4 respectively. In parallel to delivery, we will continue to engage with stakeholders and progress the required planning applications in early 2026. Ofwat will consider access to funding as part of the 2026 cost change process.

1.1.8 There continues to be a wider strategic risk around the political and campaign focus on Windermere, and the potential for longer term goals to distract from the short-term benefits being delivered by these projects. UUW is committed to the government's "only rainwater" vision. However, given this will take significantly longer to deliver than the more immediate improvements described in this submission we strongly believe the package one schemes need to go ahead as quickly as possible. This will maximise benefits for residents, businesses and visitors to Windermere while longer term plans are formed.

1.1.9 There is also the potential for current or future first time sewerage applications to interact with the improvements described in this submission. Again we believe that waiting for the outcome of these applications and the potential receipt of future applications will delay the realisation of benefits around Windermere to the detriment of local communities, businesses and residents. On this basis, we propose to proceed to deliver the package one projects at the earliest opportunity, and consider the implications of any future successful first time sewerage applications at the time they are approved.

2. Background and Objectives

2.1.1 This section outlines the objectives of the Windermere programme, including statutory compliance requirements. The information aligns with UUW's draft determination response Windermere enhancement case (UUWR78). Exceptions to this are highlighted.

2.1.2 The enhancement schemes for Windermere are driven by the Water Environment (Water Framework Directive) Regulations 2017 and Environment Act 2021 statutory drivers. In addition to these statutory drivers the Environment Agency (EA) has introduced a '25-year environment plan' non statutory driver. Where supported by customers, this allows companies to go beyond statutory requirements for locally significant issues. Under EA guidance, nine wastewater treatment works (WwTW) enhancement schemes for Windermere have been identified in AMP8, as part of a long-term plan to reduce nutrient load into Windermere under the AMP8 WINEP driver 25YEP_IMP.

2.1.3 The twelve identified enhancement schemes included in UUWR78 have been split into three work packages for the gated process to align with the timeline for developing each project. This submission relates to package one and Table 2 sets out the six projects included. It is supported by UUWLGS_P1S2_10 which sets out all Windermere package one WINEP drivers in full.

Table 2: Windermere gated programme: package one projects

Project name	Project drivers	Determinands	WINEP date	Statutory / non statutory
Troutbeck WwTW	U_IMP1	30mg/l biochemical oxygen demand (BOD), 45mg/l suspended solids, 20mg/l ammonia, 2mg/l phosphorus (annual average)	13/05/2030	Statutory
	25YEP_IMP	0.5mg/l phosphorus (annual average), 4mg/l iron (8mg/l upper tier)	31/03/2030	Non statutory
Outgate WwTW	25YEP_IMP	0.5mg/l phosphorus (annual average), 4mg/l iron (8mg/l upper tier), 40mg/l BOD, 60mg/l suspended solids, 12mg/l ammonia	31/03/2030	Non statutory
Near Sawrey WwTW	WFD_ND	8mg/l ammonia, 2mg/l phosphorus (annual average)	31/03/2030	Statutory
	25YEP_IMP	0.5mg/l phosphorus (annual average), 4mg/l iron (8mg/l upper tier)	31/03/2030	Non statutory
Far Sawrey WwTW	U_IMP1	30mg/l BOD, 45mg/l suspended solids, 20mg/l ammonia, 2mg/l phosphorus (annual average)	13/05/2030	Statutory
	25YEP_IMP	0.5mg/l phosphorus (annual average), 4mg/l iron (8mg/l upper tier)	31/03/2030	Non statutory
Grasmere WwTW	25YEP_IMP	0.25mg/l phosphorus (annual average)	31/03/2030	Non statutory
Ambleside WwTW	25YEP_IMP	0.25mg/l phosphorus (annual average)	31/03/2030	Non statutory

Source: UUW summary

2.1.4 All of the six WwTWs in package one have been identified for enhancement to meet new or more onerous phosphorus limits, with two to meet the technically achievable limit of 0.25mg/l annual average, and four to meet 0.5mg/l annual average. Four of the WwTWs in package one have also been identified for enhancement to meet additional final effluent permit requirements including BOD, suspended solids and ammonia (95th percentile).

2.1.5 Since submission one, the sanitary determinands associated with the "orphan P" at Outgate WwTW have been confirmed and updated in the WINEP by the EA.1 The additional requirements are 40mg/l BOD, 60mg/l suspended solids and 12mg/l ammonia. The EA has also confirmed that iron limits of 4mg/l and an upper tier of 8mg/l will be required at Troutbeck WwTW, Outgate WwTW, Near Sawrey WwTW and Far Sawrey WwTW. All limits have been formally included in the WINEP.

2.1.6 The package one gated schemes align with the overall strategic ambition for UUW's Drainage and Wastewater Management Plan (DWMP) to reduce phosphorus loading into waterbodies across the Northwest, accelerating the investment set out in DWMP23. Delivery of the package one schemes by 2029-30 will provide a baseline for DWMP28, allowing us to proceed at pace to achieve environmental commitments in the Windermere catchment.

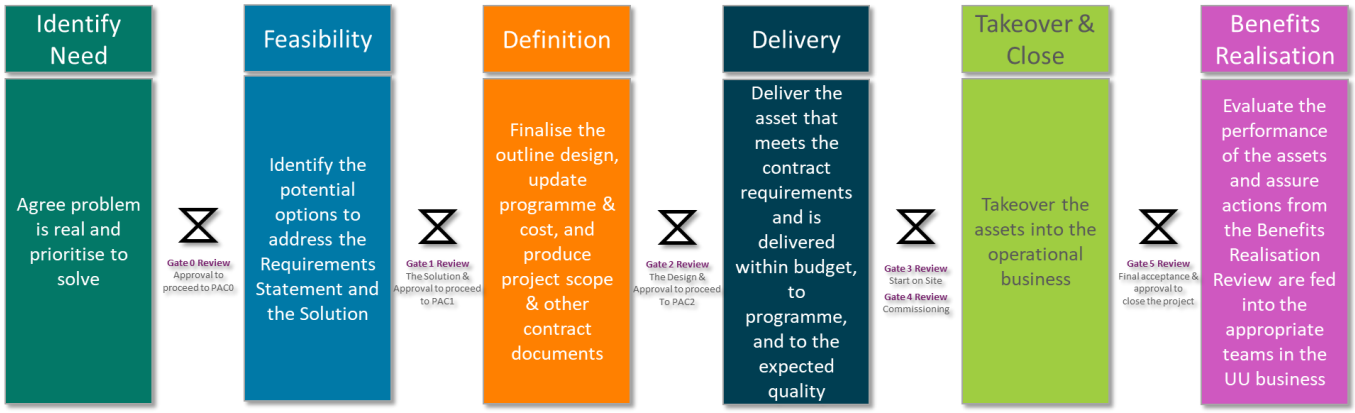
[1] Following discussions with the EA and review of the PR24 WINEP driver guidance for nutrients and sanitary determinands in surface water, it was confirmed that a numeric environmental permit for Outgate WwTW containing an 'orphan' phosphorus limit would not be accepted. We have engaged with the EA on this matter and received confirmation of additional sanitary parameters required at Outgate WwTW. These requirements have been added to the WINEP.

3. Solution design

3.1 Introduction

3.1.1 Since submission one, the package one projects have progressed through the project lifecycle set out below: from feasibility stage through project definition. During project definition, outline designs have been finalised and programmes and costs have been updated. Final outline designs have been produced with input from the engineering team, suppliers and the site operations team. This collaborative approach has ensured that the final outline designs consider solution resilience, access, maintenance, commissioning, handover and operability of the new assets.

Figure 1: Project delivery lifecycle



Source: UUW

3.2 Key drivers of design change

3.2.1 During definition stage, there have been two key drivers of design change: power resilience (flagged as a risk in submission one) and the approach to project commissioning, which has been informed by learning from FujiClean trial information at other sites.

Power Resilience

3.2.2 At submission one, we planned to manage power for the FujiClean sites using small kiosks to feed each of the process stages. We have subsequently undertaken a hazard and operability (HAZOP) study and an access, lifting and maintenance (ALM) workshop which has informed a revised approach to power resilience.

3.2.3 Resilience is a problem for the power distribution network in Cumbria and a significant risk to the successful operation of UUW sites. The network is extremely rural and has one of highest proportions of rural overhead lines in England, which are more vulnerable to failure (e.g. related to weather) than underground cables. Package one sites have experienced regular mains failures and voltage disturbances.[2] [✂

] Should the mains power supply fail, the site would immediately switch over to draw power from the battery system. If a prolonged outage was experienced at the site, the standby generator is designed to automatically change over to power the site and recharge the battery.

3.2.4 [✂

[2] For example, there have been 98 mains power failures at Near Sawrey in the past five years, in addition to voltage disturbances.

]

3.2.5 [✂]This means that planning permission and land purchase is now required for these schemes.

3.2.6 The consequential impact of power resilience changes on cost is described in section 5 and the impact on programme in section 6.

Commissioning

3.2.7 As FujiClean and Flocell are innovative technologies, we have sought to incorporate learning from the commissioning and operation of the trial temporary FujiClean and Flocell units into the final outline design programmes. First hand operation of these technologies has increased understanding of the sequencing of the commissioning process and this has been reviewed for each of the FujiClean sites. Specific consideration has also been given to the optimisation of the phosphorus removal system and tertiary solids removal (TSR), including how this is balanced against the iron constraints within the permit.

3.2.8 A period of optimisation and assurance is expected at each site, followed by a 28-day testing period, prior to the output being claimed. The settings on the FujiClean electrocoagulation will be optimised during commissioning to optimise the balance between an increase in phosphorus removal and the risk of iron carry over.

3.3 Development of final outline design

3.3.1 This section provides an overview of the work undertaken for each project and the impact on outline design. Further detail is included in the site-specific single solution papers (SSPs) which are provided as part of this submission as part of UUWLGS_P1S2_13 to UUWLGS_P1S2_18.

3.3.2 We have carried out a series of common design activities between submission one and two for the FujiClean projects at Troutbeck WwTW, Outgate WwTW, Near Sawrey WwTW and Far Sawrey WwTW:

- We have developed Piping and Instrumentation Diagrams (P&IDs) and a process control philosophy, and completed a HAZOP review, with input from UUW Operations and suppliers of both FujiClean and Flocell, in line with UUW's standard design delivery methodology.
- We have undertaken a HAZOP workshop to assess the operational interventions required to ensure that the solution is both robust in terms of achieving compliance with the permit and safe to operate. The output fed into the outline design and P&IDs.
- We developed a 3D model of the site layout and undertook an ALM review as part of UUW's standard design delivery methodology. This included UUW Operations, Engineering and Commissioning teams, as well as the technology suppliers and Construction Delivery Partner (CDP). It explored safe arrangements for accessing plant for maintenance activities and operational interventions, safe lifting of any equipment and safe access for removal of any plant for maintenance envisaged by the suppliers. Outputs were reflected in the revised design and 3D model.
- We incorporated telemetry signals required for the future operation of the site into the design.

- We have made requests to the Distribution Network Operator (DNO) for either new connections or upgrades to the current single-phase supplies. Cost and programme allowances have been made for these upgrades.
- Finally, we developed the design for [✂].

3.3.3 The remainder of this section provides an overview of the final outline solution for each site, along with the site-specific design activities undertaken between submissions one and two.

Troutbeck WwTW

3.3.4 The solution at Troutbeck WwTW is to replace the existing assets and provide full treatment with a FujiClean incorporating an electrocoagulation system for phosphorus removal and a Flocell for TSR.

3.3.5 Due to constrained land availability, the new FujiClean units will need to be installed within the same footprint as the existing submerged aerated filter (SAF) treatment process. To maintain permit compliance during construction of the new works, a temporary FujiClean unit has been installed and commissioned in a separate area of the site. This will allow the existing SAF treatment process to be removed and facilitate uninterrupted treatment throughout the construction phase. The temporary FujiClean unit will be removed once the new FujiClean and Flocell units have been fully commissioned.

3.3.6 During the HAZOP workshop we identified a need to expand the site onto adjacent land further down the hill to facilitate safe operational access and maintenance for the new assets. We have included additional fencing, gates and pathways in the final outline design to allow safe access to reach the new assets. This has led to a need for additional land purchase and planning permission.

Outgate WwTW

3.3.7 The solution at Outgate WwTW is to achieve the new, more stringent, numerical permit in the most efficient manner, while delivering within challenging access and space constraints. The final outline solution retains the existing WwTW assets, apart from the reactive media, and provides additional treatment with FujiClean technology incorporating electrocoagulation for phosphorus removal and TSR using a Flocell. The design of the FujiClean and Flocell is based on polishing the residual biological oxygen demand (BOD), suspended solids and ammonia concentrations and to meet the phosphorus driver and associated iron permit.

3.3.8 Flows at Outgate currently pass through a primary settlement tank and into a trickling filter. For the proposed new solution, flows will be intercepted after the trickling filter and pass through a bank of three FujiClean units, then onto TSR. The TSR technology selected in the final outline design is Flocell, which will be operated in a re-circulating configuration taking flows off from the humus settlement tank, passing through the Flocell and returning flows to the humus settlement tank feed. This will provide additional process resilience by providing buffer capacity of tertiary treated effluent within the humus settlement tank.

3.3.9 Following submission one in October 2025, we have undertaken the following site-specific design activities to finalise the outline design for this scheme:

- Developed a pumping station design which was considered pragmatic for such a remote site incorporating fixed speed pumps running on level control.
- Identified suitable locations for the [✂], a particular challenge on this very constrained site.

3.3.10 During the ALM we concluded that additional permanent land will be needed to provide space for the [✂]. Additional land will also need to be occupied under a temporary licence to allow for site set up, working and laydown space. This has led to a need for planning permission and land purchase.

3.3.11 There is not currently an access road into Outgate WwTW. Access requires using a cross-country all-terrain vehicle through a narrow right of access between holiday lets and into open farmland. The proposed solution now includes the construction of a new, permanent track past the holiday lets which will enable safe, year-round access. Four different routes are being considered, which all involve significant challenges due to the third-party constraints, physical constraints and steep topography. The final solution for construction and permanent access will require landowner agreement, planning permission and permits from the Highway Authority.

Near Sawrey WwTW

3.3.12 The solution at Near Sawrey WwTW is to achieve the more stringent permit drivers for ammonia and phosphorus in the most efficient manner by retaining the existing performing assets and providing additional treatment with FujiClean incorporating electro-coagulation for phosphorus removal and TSR using a Flocell. The design for Near Sawrey is based on polishing the residual BOD, suspended solids and ammonia concentrations to meet the phosphorus and ammonia drivers and the associated iron permit.

3.3.13 The existing secondary treatment assets at Near Sawrey already provide significant biological treatment. The final outline design decision was made to augment the existing treatment, rather than to replace it at increased cost. All flows will be intercepted after the rotating biological contactors (RBC) and will pass through four FujiClean units operated in parallel. Flows will then pass into the humus settlement tanks and be treated by a recirculating Flocell.

3.3.14 Following submission one in October 2025, we have undertaken the following site-specific design activities to finalise the outline design for this scheme:

- We developed the low embankment design, needed to allow new equipment to be partially buried to minimise visual impact, and confirmed safe constructability aspects. We confirmed access arrangements for safely desludging the FujiClean units. We considered two possible locations for the Flocell TSR unit and identified a preferred location based on safe operational access and minimal impact on existing assets.
- We developed a pumping station design which was considered pragmatic for such a remote site incorporating fixed speed pumps running on level control.

3.3.15 The existing Near Sawrey site is leased from the National Trust and is situated in an open landscape. There is little space for any development within the existing boundary but adjacent land used by the National Trust for overflow car parking for Hill Top is sufficient for the development. Negotiations with National Trust to use this land have been positive and the design has been adapted to meet their requirements. Planning permission will be required for the WwTW extension.

3.3.16 The limited working space, together with the sensitive environmental context has driven the development of the solution. There are challenges of working near existing assets and limitations on the size of construction plant and equipment that can fit on site. Additional National Trust land will need to be occupied under a temporary licence to allow for site set up, working and laydown space.

Far Sawrey WwTW

3.3.17 The solution at Far Sawrey WwTW is to achieve the new, more stringent, numerical permit in the most efficient manner while delivering within challenging access and space constraints. The final outline solution retains the existing assets and provides additional treatment to meet the new permit requirements using FujiClean technology incorporating electro-coagulation for phosphorus removal and TSR using a Flocell. The design of the FujiClean and TSR assets is based on polishing the residual BOD, suspended solids and ammonia concentrations and to meet the phosphorus driver and associated iron permit.

3.3.18 Flows to the works currently pass through a PST and on to a trickling filter. The new solution will intercept the flows after the trickling filter and they will then pass through a bank of three FujiClean units operating in parallel, into the existing humus settlement tank and onto TSR. The TSR technology

selected is Flocell, which will be operated in a re-circulating configuration taking flows off from the humus settlement tank, passing through the Flocell and returning flows into the humus settlement tank feed.

3.3.19 Following submission one in October 2025, we have undertaken the following site-specific design activities to finalise the outline design for this scheme:

- To enable safe construction, we have designed a retaining wall. Space at Far Sawrey WwTW is extremely limited, and the new assets will be located near a steep upward embankment.
- We have developed the design for a pumping station taking into consideration the remote location of the site. The design is based on fixed speed pumps running on level control. We have also developed the design of the electrical and control systems. This was a particular challenge due to the space constraints on site and [✂].
- The design of the control panel and kiosk was developed to avoid the need for additional permanent land requirements. However, temporary land for use as a compound during the construction period is required adjacent to the site. This will require planning and is subject to agreement with the landowner.

3.3.20 Vehicle access into Far Sawrey WwTW is challenging. Access is from a narrow B-road with a very sharp turn into the site. The slope of the concrete site road is steep and space for turning is extremely limited. Current proposals are for a temporary compound to be located opposite the entrance to the site, which is likely to require traffic management to be put in place to ensure the safety of the site team and the public

Grasmere WwTW

3.3.21 For the last four years Grasmere WwTW has met the future permit of 0.25mg/l phosphorus averaging below 0.2 mg/l. While a "do nothing" option was considered for Grasmere WwTW, the current dosing control operation is not sophisticated enough to consistently achieve compliance with the tighter phosphorus driver to 2050 (the design horizon for the project). Therefore, an upgrade is required to provide greater dosing control accuracy and specification.

3.3.22 There is a growth in population anticipated to the 2050 design horizon.[3] This means that additional ferric dosing is required to continue to meet current phosphorus performance and maintain compliance with the new 0.25 mg/l phosphorus permit. The existing assets at Grasmere for chemical storage and dosing and TSR are already sufficiently sized and therefore no additional capacity is required.

3.3.23 There is a separate project at Grasmere WwTW which is part of package three, due for submission one in October 2026, to meet the IMP4 driver of not more than 10 spills per year on average . The associated solution will result in Grasmere WwTW receiving maximum flows both more often and for extended periods of time, due to the additional returns from a new detention tank solution. The final outline solution for Grasmere WwTW therefore needs to be suitable to meet the new phosphorus permit taking into consideration the future spills driver.

3.3.24 The solution is to upgrade the dosing control regime to ensure reliable compliance under varying flows and loads. This will be achieved by replacing the Programmable Logic Controller (PLC) and Human Machine Interface (HMI) with modern hardware capable of hosting advanced control software. The new system will provide:

- Enhanced responsiveness to fluctuating flows and loads from storm events and seasonal tourism;

[3] Population data is based on the latest WEF annual returns dataset as a baseline and a growth model for the forecast to the end of the AMP and the design horizon 2050. The growth model used is from Edge Analytics, and includes growth data from Local Plans and planning applications submitted to local authorities.

- Diurnally profiled dosing, based on site-specific sampling data; and
- A ‘tourist day’ mode, allowing increased dosing during high visitor periods.

3.3.25 The solution at Grasmere WwTW represents the best opportunity to leverage the existing assets, offering exceptional value while ensuring compliance with the new phosphorus driver.

3.3.26 At submission one in October 2025, the design philosophy associated with the ferric dosing system was already confirmed for Grasmere WwTW. The required interventions are relatively simple from a technical perspective. As such, these have remained fixed and have not required development between submission one and submission two.

Ambleside WwTW

3.3.27 Ambleside WwTW currently operates under the existing phosphorus permit of 0.5mg/l averaging at a phosphorus concentration of 0.20 mg/l. A “do nothing” option was considered for Ambleside WwTW, however an engineering review confirmed that the current dosing control lacks the sophistication required to consistently achieve the tighter phosphorus driver of 0.25mg/l.

3.3.28 A separate project at Ambleside WwTW will provide new detention tanks to meet the spills driver of not more than 10 spills per year on average. When these tanks are emptied following storm events, additional flows will be passed forward to the works which will increase operational complexity of the works to meet all site permits. These additional flows , combined with anticipated population growth by the 2050 design horizon, make a robust chemical dosing system essential to maintain compliance. Therefore, the “do nothing” option was not considered appropriate as an option.

3.3.29 The final outline design to upgrade the dosing control regime to ensure reliable compliance under varying flows and loads will be achieved by replacing the PLC and HMI with modern hardware capable of hosting advanced control software. The new system will provide:

- Enhance responsiveness to fluctuating flows and loads from storm events and seasonal tourism;
- Diurnally profiled dosing, based on site-specific sampling data; and
- A ‘tourist day’ mode, allowing increased dosing during high visitor periods.

3.3.30 The solution at Ambleside WwTW is a minor change to leverage the existing assets, offering exceptional value while ensuring compliance with the phosphorus driver.

3.3.31 At submission one in October 2025, the design philosophy associated with the ferric dosing system was already confirmed for Ambleside WwTW. The required interventions are relatively simple from a technical perspective. As such, these have remained fixed and have not required development between submission one and submission two.

4. Solution compliance requirements

4.1 Introduction

4.1.1 This section provides an overview of:

- Environmental assessments undertaken; and
- Carbon accounting.

4.2 Environmental assessment

4.2.1 All the development proposals are within the Lake District National Park (LDNP) and covered by Schedule 2 of the Environmental Impact Assessment Regulations 2017. The schemes require screening by the LDNP as to the need for Environmental Impact Assessment (EIA).

4.2.2 Due to the small scale of the proposed developments, the risk of requiring EIA is very low. To reduce the programme and the resource commitments - including those of our regulators - we have agreed with the LDNP that where a planning application is required (i.e. at Troutbeck, Outgate, Near Sawrey and Far Sawrey) the screening opinion would be considered as part of the main planning application process. Accordingly, we have not made separate requests for screening opinions.

4.2.3 Environmental surveys and assessments have been undertaken to support the required planning applications, and the scope of work has been agreed with LDNP through informal discussions and the use of its pre-application advice service (see section 9.2). This covered key topics including ecology, heritage, landscape and visual and flood risk.

4.2.4 We have an AMP8 programme-wide Discretionary Advice Service agreement in place with Natural England and "call off" this agreement for project-specific advice. Projects are screened for Habitats Regulations Assessment (HRA) requirements, including for the initial ground investigation works in discussion with the Natural England team. A HRA will be prepared and agreed with Natural England for submission with the planning applications at Near Sawrey WwTW and Outgate WwTW.

4.2.5 Through regular engagement with the EA, we have shared details of how solutions will meet requirements (see UUWLGS_P1S2_10 for a full list of package one requirements)**,** including sharing single solution papers to provide details relevant to each scheme. As outlined in UUWLGS_P1S2_13, the EA is supportive of sites moving to numeric standards where currently descriptive, recognising the potential of the schemes to avoid deterioration in the catchment. Additionally, the EA has expressed support for proposed solutions, as outlined in the single solution papers, considering constraints on locations and sensitive nature of the area.

4.3 Carbon

Carbon estimating methodology

4.3.1 The whole life carbon impact for each scheme has been quantified using our carbon estimating process, following the requirements of the Water Resource Planning guidelines. The process was developed to be aligned with global standard guidance for carbon quantification[4]. The lifecycle modules covered in our whole life carbon approach include A1-A5, B1, B2, B4 and B6, following EN 15978:2011 Sustainability of Construction Works. We apply a whole life period of 30 years in our assessments.

4.3.2 For capital carbon (A1-A5), our approach uses a database of 'cradle to build' carbon models for water sector assets (i.e. pumps, access roads). These models draw on industry-recognised emission factor

[4] Including UKWIR (2012) Framework for accounting for embodied carbon in water industry assets and the GHG Protocol.

inventories for typical construction materials, fuels and construction techniques. Where sufficient design information or a carbon model is not available, a carbon intensity metric is applied.

4.3.3 For operational usage carbon (B1 and B6), our estimating process quantifies power consumption, chemicals and additional sludge transport as a result of operating our new assets, using emission factor inventories such as the Carbon Accounting Workbook and Defra greenhouse gas (GHG) Conversion Factors. Carbon sequestration from land change has also been quantified, drawing from industry literature for sequestration rates.

4.3.4 At this stage in design, several assumptions have been factored into the carbon estimates such as materials, quantities and transportation distance among other items. As project design progresses, our estimates will be updated and the level of uncertainty will be reduced as these assumptions are replaced with specific design data.

Scheme carbon emissions and other Greenhouse gases

4.3.5 The table below presents the estimated whole life carbon emissions of the package one schemes, expressed as tonnes of carbon dioxide equivalent (tCO2e). Associated carbon costs (expressed as £) for each scheme are found in Section 5.3.

Table 3: Carbon emission estimates for Windermere package 1 schemes

Project	Capital Carbon (tCO2e)	Replacement Carbon (tC02e/30 years)	Operational Usage Carbon (tC02e/year)	Maintenance Carbon (tC02e/year)	Sequestered Carbon (tC02e/year)[5]	Whole Life Carbon (tC02e/30 years)
Troutbeck WwTW	784.64	702.29	2.24	11.83	0.00	1908.85
Outgate WwTW	742.30	893.99	3.41	11.87	0.00	2049.59
Near Sawrey WwTW	1031.11	1049.62	3.00	19.11	0.000015	2743.88
Far Sawrey WwTW	811.54	929.27	3.41	12.54	0.000040	2219.37
Grasmere WwTW	0.20	0.43	0.00	0.00	0.000006	0.63
Ambleside WwTW	6.71	13.73	6.30	0.00	0.00	209.54

Source: UUW Carbon Emissions Summary

4.3.6 With regards to the environmental impact of other GHGs such as those identified under the Kyoto Protocol, please see the table below for their relevance to the proposed Windermere solutions.

Table 4: Environmental Impact of greenhouse gasses

Carbon dioxide (CO_2)	• Carbon dioxide emissions have been quantified for all solutions following our whole life carbon approach as detailed above.

[5] A positive carbon sequestration value indicates a loss of carbon sequestration.

Methane (CH_4)	• Methane emissions have not been quantified for the projects. • For Ambleside WwTW and Grasmere WwTW, adjustments to the chemical dosing regime may have a minor, indirect influence on methane generation at the treatment works. • For Far Sawrey, Near Sawrey, Outgate and Troutbeck WwTW, it is expected that methane emissions will be released as a result of the proposed schemes, however we expect these emissions to be lower when compared to traditional septic tank systems due to FujiClean's aeration philosophy. • For all projects, methane emissions may be emitted from the tailpipe of vehicles travelling to site as a result of construction or additional deliveries to site.
Nitrous oxide (N_2O)	• Nitrous oxide emissions have not been quantified for the projects. • For Ambleside WwTW and Grasmere WwTW, changes to the chemical dosing regime may have a minor, indirect influence on nitrous oxide generation at the treatment works. • For Far Sawrey, Near Sawrey, Outgate, and Troutbeck WwTW, nitrous oxide emissions may occur from the Fujiclean process due to nitrification and denitrification. However, these emissions are expected to be minimal given the small scale of the sites, and we believe there is an overall benefit of reducing nitrogen discharge in receiving waters. We do not believe there is any global data on Fujiclean N_2O emissions and research is ongoing into N2O emissions more broadly. Any differences compared to other secondary treatment technologies are likely negligible at these population sizes. • For all projects, nitrous oxide emissions may be emitted from the tailpipe of vehicles travelling to site as a result of construction or additional deliveries to site.
Hydrofluorocarbons (HFCs)	• It is not anticipated that hydrofluorocarbons will be emitted as a result of the Windemere projects.
Perfluorocarbons (PFCs)	• It is not anticipated that perfluorocarbons will be emitted as a result of the Windemere projects.
Sulphur hexafluoride (SF_6)	• Sulphur hexafluoride can be found in high voltage switchgear. However at this stage of design, it is not anticipated that sulphur hexafluoride will be present in the low voltage electrical switchgear that is planned for the Windemere projects.

Source: UUW

Our approach to carbon reduction

4.3.7 Our approach to carbon reduction for the Windermere projects follows the carbon management process we adopted for the AMP8 capital programme. This process follows PAS 2080[6] principles and reflects Ofwat's Net Zero Principles Position Paper by embedding whole-life carbon management and the carbon reduction hierarchy—avoid, switch, improve—throughout the project lifecycle. This supports reductions in both capital and operational emissions.

4.3.8 At this stage in design, there has been a greater focus on assessing opportunities for 'reduced build' solutions. As an example, at Near Sawrey WwTW our solution augments the existing biological treatment capacity by reusing the existing primary tank, rotating biological contractors, humus settlement tank, vastly reducing cradle to build carbon emissions when compared to replacing the biological process in its entirety. At Grasmere WwTW, we plan to enhance the dosing control regime, avoiding the need for new civil infrastructure and associated construction emissions.

4.3.9 The adoption of innovative technologies has also allowed carbon emissions to be reduced:

- FujiClean does not require chemical dosing for phosphorus removal. This negates carbon emissions associated with construction of chemical dosing infrastructure, deliveries of chemicals to site and the production of chemicals to be used in operation. FujiClean has low power requirements and minimal desludging requirements, further reducing operational emissions when compared to a traditional chemical dosing solution.

[6] PAS2080:2013 Carbon Management in Buildings and Infrastructure

- Flocell uses air agitation for cleaning rather than energy intensive backwashing and pumping used in conventional filtration systems. This lower energy demand results in less indirect carbon emissions from electricity generation. In addition, the cleaning cycle has no moving parts leading to lower maintenance requirements and associated emissions from activities such as site visits and servicing.

4.3.10 As the Windermere projects progress into later stages of design, the carbon estimates will be updated to become increasingly accurate and to reflect our design choices. These results will be evaluated and further opportunities for carbon reduction and mitigation will be explored. These opportunities may include the use of green site welfare facilities (i.e. powered by renewable energy), lower carbon materials and efficient use and reuse of resources. Opportunities will be tracked and considered through our carbon management process.

5. Solution costs and benefits

5.1 Introduction

5.1.1 This section:

- Sets out the efficient solution cost estimates for package one projects, all of which are underpinned by the costing methodology and deliver efficient benchmarks opposite Ofwat's PR24 cost models;
- Describes UUW's approach to best value assessment and solution benefits; and
- Summarises the key changes from the solutions and costs set out in submission one.

5.1.2 We are now at the end of the definition stage of project development, and as such the level of uncertainty in cost estimates set out in submission one has reduced. Costs estimates will continue to change through delivery and we will communicate these further changes to Ofwat through Delivery Plan updates and large schemes quarterly reporting.

5.1.3 All costs in this submission are provided in 2022/23 CPIH-adjusted prices.

We have attached supporting evidence to this submission

5.1.4 We also attach the following supporting documents to this submission:

(a) A change log covering the package one projects (UUWLGS_P1S2_06 Change Log);

(b) Individual capital cost estimates for each project in package one as part of the scheme-specific supporting documents UUWLGS_P1S2_14 to UUWLGS_P1S2_19 inclusive;

(c) Tables CWW19 and ADD17, along with accompanying commentary (UUWLGS_P1S2_11 Data tables).

5.2 How we have developed and benchmarked our costs

Estimating methodology

5.2.1 Building on UUW's parametric cost estimates for submission one, we engaged our supply chain partner to review and update based on the developed design and site-specific requirements including additional power resilience, planning requirements and site topography.

5.2.2 We reviewed the contractor's costs and applied a c. 13 percent challenge using our own knowledge and experience. UUW estimators and subject matter experts reviewed the direct works and re-assessed contractor prices to secure additional efficiencies. The staff and design profiles were also reviewed by the project teams to ensure that the roles and resource levels forecast were reasonable in relation to scale and size of the scope deliverables and fell within the contract definition of defined costs. This challenge contributed £2m cost savings relative to contractor pricing.

5.2.3 While for submission one we uplifted the direct costs of construction using a relatively high-level approach to provide for indirect costs, risk and overheads, we have now assessed the specific requirements of each site and replaced these uplifts with detailed estimates:

- Informed by project teams and specialist input where required, we have produced staff profiles aligned to programmes, and land estimates that align with detailed site layouts and recent consultation with landowners;
- The risk provision is driven by a full risk review of the projects and the associated costed risk registers, as described in section 6.3; and
- Opex costs are derived from operating plans consistent with our PR24 methodology and reflect the output in use dates of each scheme.

5.2.4 This has led to a more detailed and accurate bottom-up cost estimate.

Cost estimates

5.2.5 Table 5 below summarises our view of totex costs at each site.

Table 5: Summary of totex costs (£m, 2022/23 CPIH prices)

	Troutbeck WwTW phosphorus and sanitary	Outgate WwTW - phosphorus	Near Sawrey WwTW – phosphorus and sanitary	Far Sawrey WwTW – phosphorous and sanitary	Grasmere WwTW – phosphorus	Ambleside WwTW - phosphorus	Total
Capex	4.5	4.3	5.6	4.4	0.1	0.2	19.1
Opex	0.1	0.1	0.1	0.1	0.0	0.0	0.5
Totex	**4.6**	**4.4**	**5.8**	**4.5**	**0.1**	**0.2**	**19.6**

Source: UUW Estimating

External benchmarking: comparison to Ofwat's Final Determination enhancement models

5.2.6 We have compared the costs for each project to modelled costs calculated using Ofwat's PR24 enhancement models. As for submission one, we have maintained all elements of Ofwat's PR24 methodology for this submission such as retaining the reconciliation adjustment that corrected for differences between CWW3 and scheme level business plan data tables. We have also rebased the frontier shift efficiency challenge to the current year.

5.2.7 This is set out in Table 6 below, which aligns with CWW19 and ADD17 . Where schemes are delivering against multiple enhancement drivers these are captured in both tables. We have updated the modelled cost for Outgate reflecting the fact that since the submission of package one, the sanitary determinands associated with the orphan P at Outgate WwTW have been confirmed by the EA.

Table 6: We are considered efficient relative to Ofwat's FD models for phosphorus removal and sanitary determinands at a programme level (£m, 2022/23 CPIH prices)

	P-removal			Sanitary		
Project name	Modelled allowance	Totex estimate	Variance	Modelled allowance	Totex estimate	Variance
Troutbeck WwTW	3.8	3.0	0.8	2.1	1.6	0.5
Outgate WwTW	3.8	2.9	0.9	2.1	1.5	0.6
Near Sawrey WwTW	3.8	3.8	0.0	2.1	2.0	0.1
Far Sawrey WwTW	3.8	2.9	0.8	2.1	1.6	0.5
Grasmere WwTW	3.6	0.1	3.5	0.0	0.0	0.0
Ambleside WwTW	4.1	0.2	3.8	0.0	0.0	0.0
Total	**22.6**	**12.9**	**9.8**	**8.4**	**6.7**	**1.7**

Source: UUW analysis based on Ofwat's PR24 Final Determination

We have not included any element of base expenditure within our cost estimates

5.2.8 The investment drivers for these projects (as described in section 2) will require a step-change in performance at each site. As reflected in section 3, the solution scope items relate to the installation of new assets rather than maintenance of existing assets. As such, we are clear that our costs relate to enhancement expenditure only and therefore base expenditure is excluded.

We have updated our view of cost since submission one

5.2.9 Table 7 summarises changes to costs since submission one, with total costs increasing by 35 per cent.

Table 7: Summary of changes since submission one (£m, 2022/23 CPIH prices)

Scheme	Submission one	Updated estimate	Change
Troutbeck	3.8	4.6	0.8
Outgate	3.5	4.4	0.9
Near Sawrey	4.2	5.8	1.6
Far Sawrey	3.0	4.5	1.5
Grasmere	0.04	0.1	0.1
Ambleside	0.1	0.2	0.1
Total	**14.6**	**19.6**	**5.0**

Source: Submission one estimate: Windermere package one submission one, 1 October 2025; Updated estimate as Table 5

5.2.10 The key changes in cost relate to:

- power resilience - as set out in section 3.2, provision of improved power resilience on the FujiClean sites through [✂]
- commissioning periods - due to the innovative solution being implemented on site, the commissioning approach has been revised to include periods for optimisation and assurance; and
- scope and programme development, including supply chain pricing input and some site-specific changes:
  - For Far Sawrey, this includes increased design costs relating to retaining walls and increased construction risk.
  - For Near Sawrey this includes the completion of additional on-site feasibility work to assess various options and layouts, which has allowed efficiencies to be realised on the remaining sites.

5.2.11 These changes are summarised in Table 8, with the most significant changes described in further detail below and are also set out in our supporting document UUWLGS_P1S2_06 Change Log.

Table 8: Cost changes between submissions one and two (£m, 2022/23 CPIH prices)

Description	Change
Improved power resilience	2.0
Commissioning periods	1.3
Scope and programme development	
General design development	1.1
Additional on-site feasibility work	0.7
Opex costs	0.0
Total	**5.0**

Source: UUWLGS_P1S2_06 Change Log.

Power resilience

5.2.12 As described in section 3, the activities taken through the definition phase have allowed us to further develop our outline designs for all schemes. For the FujiClean solutions, this has included identifying a need to address power resilience concerns by installing additional assets to mitigate the impacts of power failures. These new assets have driven additional costs both directly and indirectly through their impact on land and planning requirements and knock-on impacts on the programme:

- The cost of the assets and associated civils work is now included in the cost estimates;

- Additional land costs will be incurred at Troutbeck and Outgate WwTWs to provide space for the power assets while ensuring sufficient space for day-to-day operations and maintenance; and
- The need for additional land has driven a need to obtain planning, which requires extra time in the design phase in addition to the time required to install the additional assets. This has increased staffing costs due to the scheme taking longer to deliver.

Commissioning periods

5.2.13 The increases in commissioning periods described in section 3 have also extended the programmes and therefore driven increased staff costs. This reflects several areas of development relative to the high-level durations reflected in submission one, which were informed by a single example installation. This includes:

- Our increased understanding of the commissioning process following installation of the temporary FujiClean unit at Troutbeck;
- Consideration of commissioning on a site-specific basis. For example, at Troutbeck this involves specific sequencing of the commissioning of the new FujiClean units and removal of the temporary treatment prior to the installation of TSR (Flocell);
- A greater allowance for optimisation of the phosphorus removal process at all FujiClean sites, which will now be commissioned in phases to allow BOD, suspended solids and ammonia levels to be achieved before the phosphorus removal system is commissioned; and
- An increase in complexity of the solutions because of the additional power resilience assets.

Other scope and programme development

5.2.14 As described in section 3, further design development has led to some incremental scope to ensure the sites can be safely operated and maintained. For example, this includes changing planned access tracks from temporary to permanent given increased equipment on sites.

Mitigation of cost increases

5.2.15 While costs have increased, we have minimised this increase by treating the four FujiClean sites as one contract and sharing resources across all four sites to ensure efficient delivery. This is subject to a minimum level of resource to ensure that we maintain required safety and quality standards during delivery.

5.3 Best value assessment and solution benefits

5.3.1 The schemes in the Windermere gated programme all protect and enhance Windermere, England's largest lake and an iconic site of significant importance to customers, communities and stakeholders. The package one schemes will improve final effluent standards from six wastewater treatment works that discharge into the Windermere catchment. These enhancements offer benefits across a range of areas including amenity value, biodiversity and wider environmental outcomes.

5.3.2 The value derived by society from these enhancements is central to our approach to developing them. There is strong qualitative evidence underpinning the value placed by customers and communities on the health of Windermere, with support for maintaining the health of the lake, preventing future deterioration and reducing the impacts on plants and wildlife.[7] This support underpins going beyond statutory requirements at Windermere.

5.3.3 For this submission, we have used a cost-benefit tool that reflects our current thinking on valuing the benefits of investing at Windermere and demonstrates that the six schemes in package one are cost-beneficial relative to a "do nothing" scenario. This analysis draws on our work to develop a broader "six capitals" based valuation approach to reflect changes in regulatory and government approaches to

[7] Bespoke Performance Commitments Research Report, 12 September 2023, page 53

valuations of service, the environment and amenity values, and takes account of the unique context around Windermere.

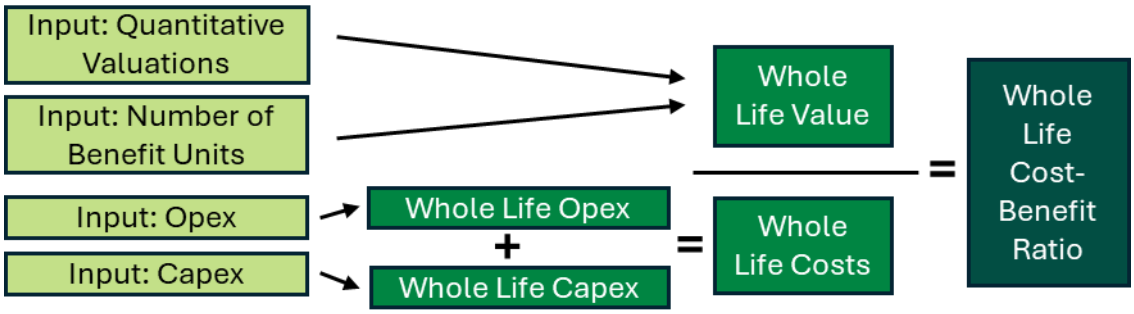
Our approach

5.3.4 Our approach comprises three key steps as summarised in Figure 2:

- Calculating the whole life value;
- Calculating the whole life cost; and
- Comparing the whole life cost-benefit ratio across different solutions.

5.3.5 These steps are described in further detail below.

Figure 2: Cost benefit analysis flow diagram



Whole life value

5.3.6 We calculate whole life value of an investment solution as the present value of the total benefits accrued over a 30-year assessment period. This is derived by:

- Multiplying the number of projected benefit units from the investment solution by the annual quantitative valuation; and
- Calculating the compounded value over the investment horizon and discounting it using the Social Time Preference Rate, in line with the HM Treasury Green Book.

5.3.7 Value-based decision making is informed by the six capitals framework, drawing from the internationally adopted Integrated Reporting and using a broad range of metrics that cover:

- natural capital metrics based on the EA's Wider Environmental Outcomes to reflect values for society and the environment (e.g. water quality, air quality);
- customers' preferences for service improvements and wider amenity values resulting from the investment solution;
- GHG emissions through the UK Government's cost of carbon;
- risks (e.g. reduced accidents, customer complaints); and
- health and safety.

Whole life cost

5.3.8 We calculate the whole life cost of an investment solution by adding the whole life capital expenditure and the whole life ongoing operating costs. Capital expenditure includes capital overheads but excludes the effect of taxation. Whole life cost has been calculated on a consistent basis to the approach taken for PR24 investment appraisal. The present value of capital expenditure has been converted to a stream of annual costs over a 30-year appraisal period. To calculate the present value of these costs, and associated operating costs, the Social Time Preference Rate was used for discounting, consistent with the HM Treasury Green Book. Costs are in 2022/23 price base, using the CPIH financial year average.

Cost benefit ratio

5.3.9 The cost benefit ratio is calculated by dividing whole life value by whole life cost.

Quantification of benefits

5.3.10 Table 9 summarises quantified benefits for the six package one schemes, together with whole life cost and the benefit cost ratio, which is substantially greater than one for each of the schemes.

Table 9: Summary of costs and benefits (£m, 2022/23 CPIH prices)

Benefit	Troutbeck	Outgate	Near Sawrey	Far Sawrey	Grasmere P	Ambleside P
River water quality (phosphorus)	5.5	9.3	7.8	10.3	69.4	22.0
Permit compliance	7.9	7.9	7.9	7.9	7.9	7.9
Carbon impact[8]	-0.5	-0.5	-0.7	-0.6	0.0	0.0
Escalated contacts	0.3	0.3	0.3	0.3	0.0	0.0
H&S - Accidents (RIDDOR equivalent)	0.0	0.1	0.0	0.0	0.0	0.0
Whole Life Value	13.1	16.9	15.2	17.8	77.2	29.9
Whole Life Cost	5.5	5.8	6.7	6.2	0.2	0.6
Cost Benefit Ratio	**2.39**	**2.92**	**2.28**	**2.86**	**393.54**	**52.85**

Source: Windermere gated submission two cost benefit analysis

5.3.11 For most schemes, the largest of the benefits valued are associated with **reducing phosphorus in Windermere**, which reduces the risk of eutrophication and algal blooms. We have valued phosphorus reductions using UUW's research to inform the Wonderful Windermere Outcome Delivery Incentive (ODI) (as set out in our business plan supplementary document UUW31). This research collated and triangulated the various sources of phosphorus valuation which ranged from £2.0- £25.4k per kg. We applied a systematic and robust approach to triangulating evidence to determine a marginal benefit rate of £13.6k per kg of phosphorus removed.[9]

5.3.12 The four FujiClean sites also deliver **improvements in BOD, suspended solids and ammonia**, for which we do not have applicable valuations. As a proxy, we have estimated the benefits associated with compliance with the tighter permits at each of the sites as a result of the investments, valued using the PR19 ODI triangulated customer research valuation for permit compliance.[10] This reflects the broad value to the natural environment over time of these interventions, and acts as a proxy for direct valuation of improvements in BOD, suspended solids and ammonia. While this may also reflect some of the benefits associated with phosphorus reduction, the majority of package one schemes are cost-beneficial based on the benefits associated with phosphorus reduction alone. Therefore any uncertainty over the allocation of these benefits between phosphorus and sanitary outputs does not affect the overall outcome of the analysis.

5.3.13 The investments will improve the performance of each treatment works to meet future tighter permits, reducing the impact and likelihood of permit failures and reducing the risk of pollution incidents. To avoid the risk of double-counting, this measure has not been included in the analysis in Table 9 above. However, the benefit is real and reinforces the benefits case reflected in the best value assessment.

[8] A sensitivity assessment was conducted on the carbon valuations. Low, central, and high valuations were taken from the Green Book, and the impacts both directly to carbon and to the projects at large were analysed. Carbon valuations varied between a range of -50 per cent to +50 per cent of the central estimate. This caused no material changes to cost benefit ratios for any of the projects assessed

[9] UUW 31, Customer research triangulation, October 2023, para 3.2.31

[10] See Performance commitments technical document, page 164. We have used PR19 valuations instead of the PR24 ODI rate. PR19 quantitative customer research provides the most robust and recent bottom-up customer valuations for this performance area, including views on environmental and societal value. In contrast, PR24 ODIs were set using a top-down RoRE approach, which weakens the link between customer valuations and the rewards or penalties applied.

5.3.14 We have also valued consequential carbon impacts, avoided customer complaints and health and safety impacts as part of this analysis, all of which make a relatively small contribution to the overall assessment.

Evidence of wider societal value of investment at Windermere

5.3.15 There is a wide range of evidence supporting the value of investment at Windermere. While these values overlap with the benefits valued above and cannot be applied in addition, together the evidence underlines the significant value attached to environmental improvements in the Windermere catchment.

Recreational value – in the context of the Windermere catchment as a tourist hotspot with exceptionally high levels of recreational activity

5.3.16 There are many approaches to capturing recreational value, although many do not appropriately account for specific locations. The most widely used approach is the University of Exeter's tool "ORVal", which is funded by Defra and was used as part of the AMP7 Natural Capital ODI.[11] ORVal suggests a present value of £48.6m across the Windermere catchment based on 750,000 visits per year. However as Love Windermere research suggests that actual visitor numbers could be closer to seven million per year, the recreational value could be significantly higher.

Tourism value

5.3.17 As well as a recreational hotspot, Windermere and the surrounding towns provide crucial economic value to the region through tourism. The EA and Cumbria Tourism's report "Windermere Catchment: Tourism Value, March 2021"[12] estimates the indirect and direct economic impact of tourism across the Windermere Catchment is £753m. It also estimates that between £24m and £122m of this could be lost due to deteriorating water quality. This economic value supports an estimated 9,315 jobs, between 303 and 2,304 of which could be put at risk due to deterioration in water quality.

Impact on the local housing market

5.3.18 There are numerous studies which link local environmental quality with property values. The B£ST Tool[13] makes use of a study from the Royal Institute of Chartered Surveyors (RICS) on the Urban Parks, Open Space and Residential Property Values, which when inflated to 2025 values, places a value of £6,533 per home benefitting from improved natural environment and £1,064 per business benefitting from improved natural environment. We estimate that there are around 12,600 unique addresses in the Windermere catchment, leading to a valuation of between £13.4m and £82.3m for a one-off increase in property values.

Non-use value

5.3.19 In environmental economics, "non-use" value refers to the intrinsic worth or significance that individuals attribute to goods or services, regardless of direct engagement with them. This is likely to be significant for Windermere, which has an iconic status, embedded into the cultural heritage of Cumbria and the UK. Although no relevant willingness to pay study exists, given the importance of the lake across the UK, Windermere's non-use value could easily be in the region of tens of millions of pounds.

[11] https://leep.exeter.ac.uk/orval/

[12] Windermere Catchment: Tourism Value March 2021

[13] www.ciriabest.com

6. Programme and Planning

6.1 Introduction

6.1.1 This section summarises the programme for the package one schemes, including for third party approvals and consents. It also provides an update on the key risks faced on the package one projects.

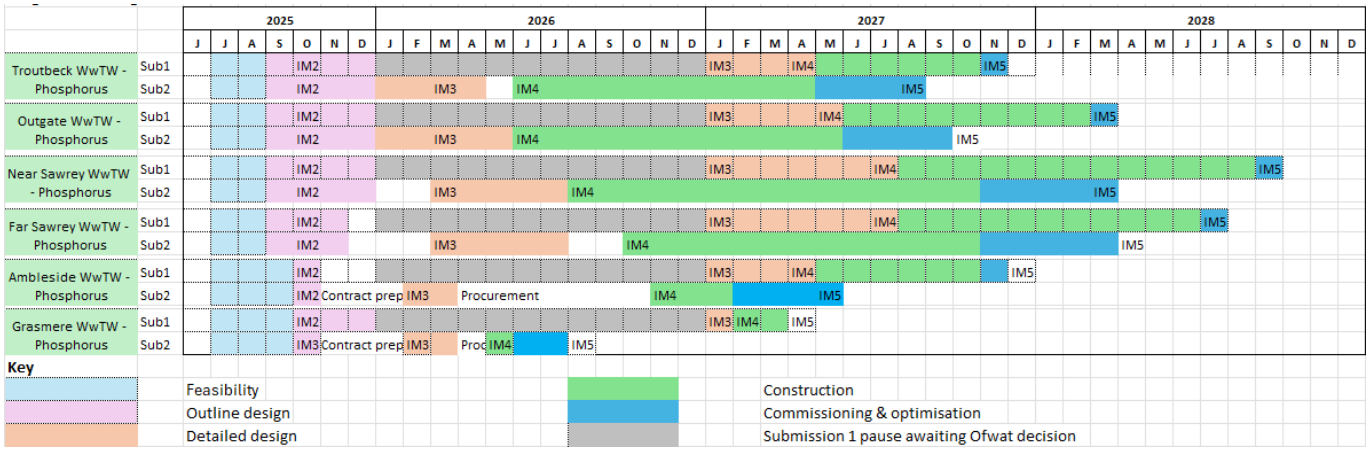
6.1.2 To support the information provided in this section we have provided;

- A detailed programme and risk register for each scheme, as part of the scheme-specific supporting documents UUWLGS_P1S2_14 to UUWLGS_P1S2_19 inclusive; and
- A finalised delivery plan, in the format required by Ofwat's delivery plan guidance as part of UUWLGS_P1S2_10.

6.2 Summary of programmes

6.2.1 We continue to use Primavera P6 to maintain programmes for each scheme. All schemes in package one are now close to the end of the definition phase and will proceed to delivery in early 2026. This is 12 months earlier than reflected in submission one as UUW has confirmed its plans to proceed to delivery prior to funding for the schemes being finalised through the 2026 cost change process to deliver benefits to customers as early as possible. The high-level changes in programmes are shown in Figure 3.

Figure 3: Summary of programme changes



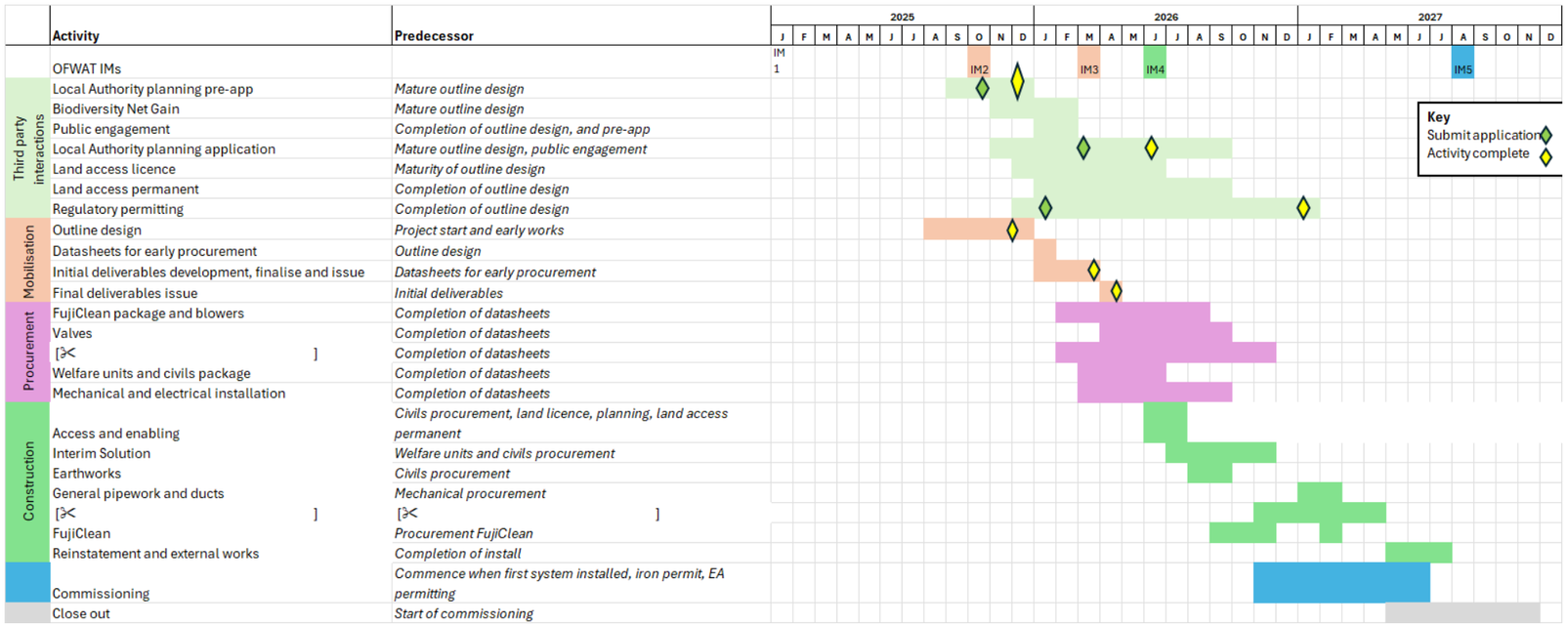
Source: UUW systems. IM6 is in March 2030 for all projects.

6.2.2 More detailed summary programmes for each of the six package one schemes are set out in Figure 4 to Figure 9. These programmes set out key milestones for each solution over the delivery phase, including key activities (third-party interactions, design, site surveys, mobilisation activities, procurement, construction and commissioning) to achieve output in use and deliver the benefits for each scheme.

6.2.3 Full planning has been included in the P6 programmes for Near Sawrey, Outgate and Troutbeck WwTW. From full submission, the programmes allow one week for submission acknowledgement, followed by thirteen weeks for planning determination. An additional seven weeks has been included in the programme to provide a time risk allowance.

6.2.4 As well as a much greater level of detail, the programmes are aligned with changes in scope since submission one, which have also been reflected in cost estimates. IM5 dates have been brought forward by three to six months across the projects, reflecting the 12 month earlier start of the delivery phase described above, offset by increased programme durations driven by increased time allowed for construction as a result of the power resilience improvements set out in section 3 and increased time allowed for commissioning reflecting an evolving understanding of the FujiClean and Flocell technologies. Programmes also now include an appropriate time risk allowance for key activities.

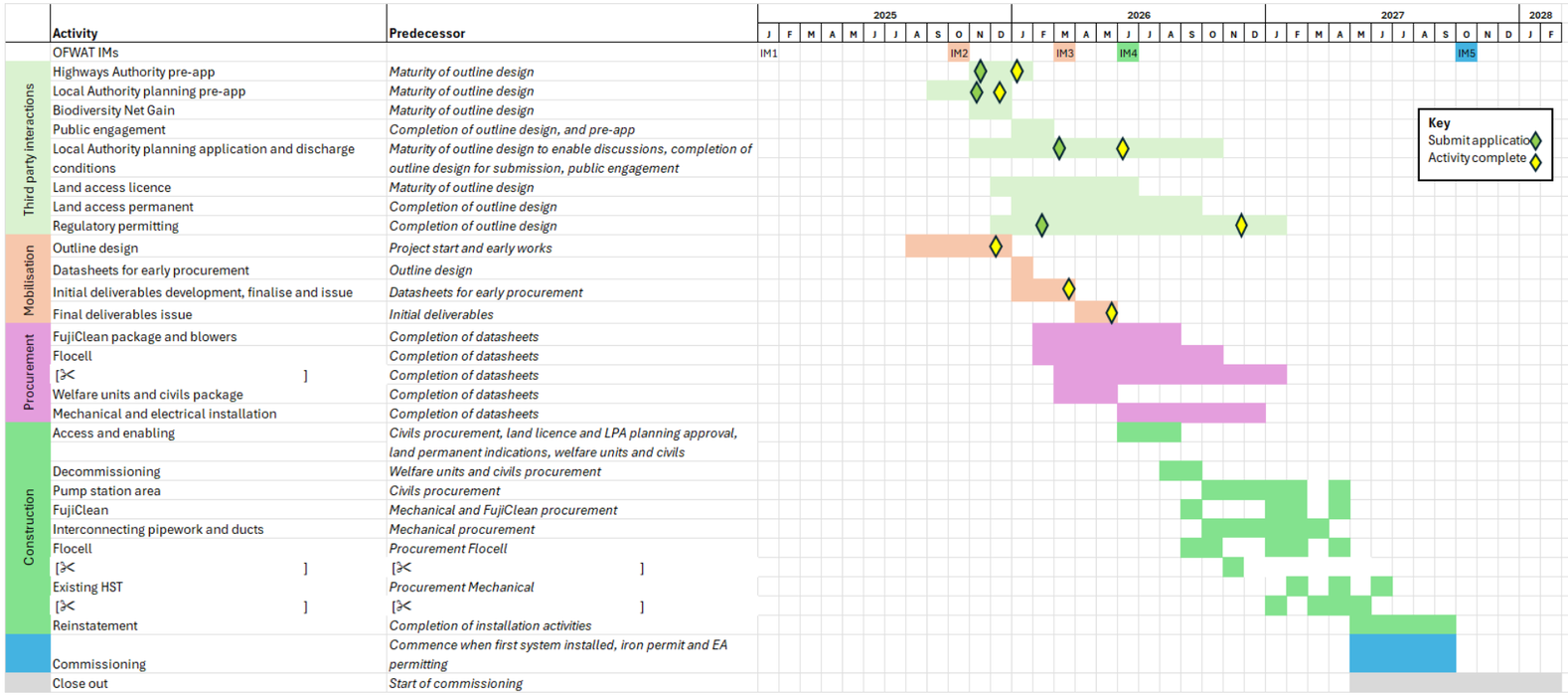
Figure 4: Troutbeck – high-level programme summary



	Activity	Predecessor
	OFWAT IMs	
Third party interactions	Local Authority planning pre-app	*Mature outline design*
	Biodiversity Net Gain	*Mature outline design*
	Public engagement	*Completion of outline design, and pre-app*
	Local Authority planning application	*Mature outline design, public engagement*
	Land access licence	*Maturity of outline design*
	Land access permanent	*Completion of outline design*
	Regulatory permitting	*Completion of outline design*
Mobilisation	Outline design	*Project start and early works*
	Datasheets for early procurement	*Outline design*
	Initial deliverables development, finalise and issue	*Datasheets for early procurement*
	Final deliverables issue	*Initial deliverables*
Procurement	FujiClean package and blowers	*Completion of datasheets*
	Valves	*Completion of datasheets*
	[✂]	*Completion of datasheets*
	Welfare units and civils package	*Completion of datasheets*
	Mechanical and electrical installation	*Completion of datasheets*
Construction	Access and enabling	*Civils procurement, land licence, planning, land access permanent*
	Interim Solution	*Welfare units and civils procurement*
	Earthworks	*Civils procurement*
	General pipework and ducts	*Mechanical procurement*
	[✂]	[✂]
	FujiClean	*Procurement FujiClean*
	Reinstatement and external works	*Completion of install*
	Commissioning	*Commence when first system installed, iron permit, EA permitting*
	Close out	*Start of commissioning*

Source: UUW systems. IM6 is in March 2030 .

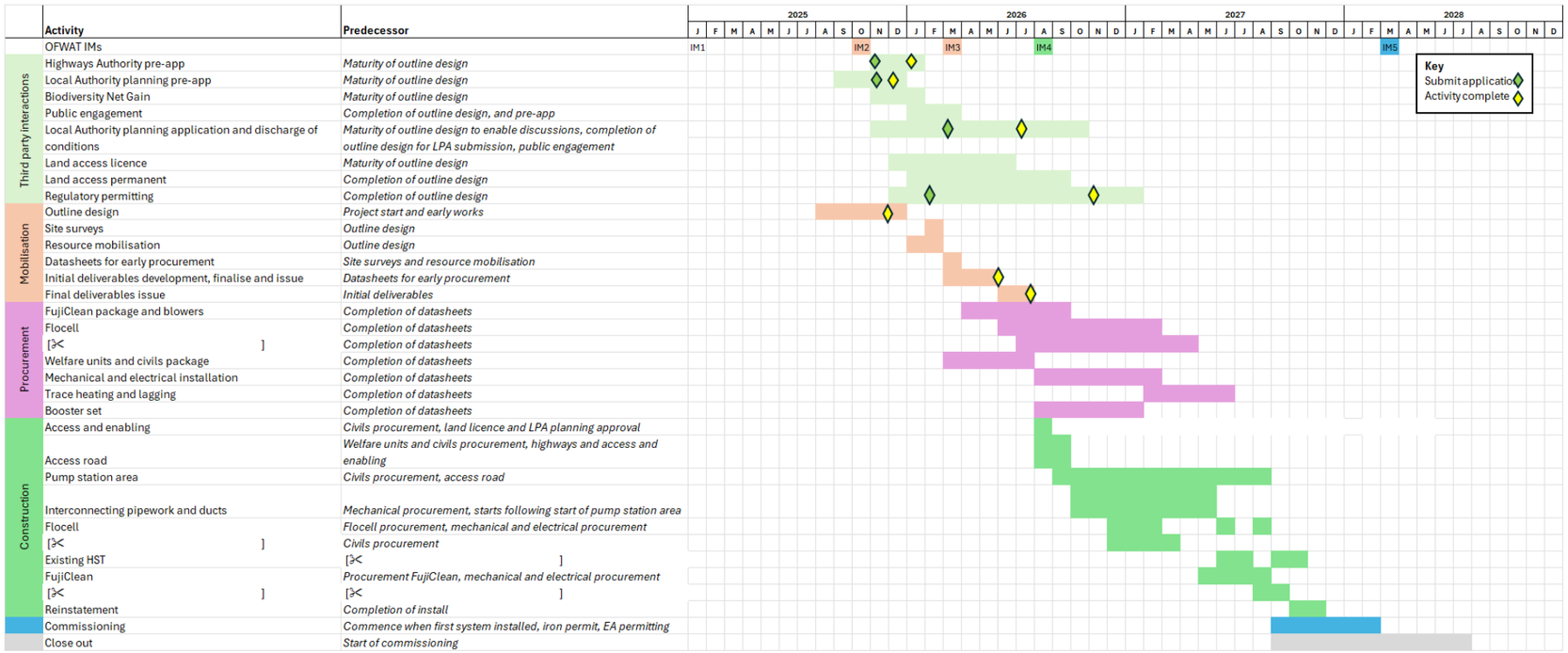
Figure 5: Outgate – high-level programme summary



	Activity	Predecessor
	OFWAT IMs	
Third party interactions	Highways Authority pre-app	*Maturity of outline design*
	Local Authority planning pre-app	*Maturity of outline design*
	Biodiversity Net Gain	*Maturity of outline design*
	Public engagement	*Completion of outline design, and pre-app*
	Local Authority planning application and discharge conditions	*Maturity of outline design to enable discussions, completion of outline design for submission, public engagement*
	Land access licence	*Maturity of outline design*
	Land access permanent	*Completion of outline design*
	Regulatory permitting	*Completion of outline design*
Mobilisation	Outline design	*Project start and early works*
	Datasheets for early procurement	*Outline design*
	Initial deliverables development, finalise and issue	*Datasheets for early procurement*
	Final deliverables issue	*Initial deliverables*
Procurement	FujiClean package and blowers	*Completion of datasheets*
	Flocell	*Completion of datasheets*
	[✂]	*Completion of datasheets*
	Welfare units and civils package	*Completion of datasheets*
	Mechanical and electrical installation	*Completion of datasheets*
Construction	Access and enabling	*Civils procurement, land licence and LPA planning approval, land permanent indications, welfare units and civils*
	Decommissioning	*Welfare units and civils procurement*
	Pump station area	*Civils procurement*
	FujiClean	*Mechanical and FujiClean procurement*
	Interconnecting pipework and ducts	*Mechanical procurement*
	Flocell	*Procurement Flocell*
	[✂]	[✂]
	Existing HST	*Procurement Mechanical*
	[✂]	[✂]
	Reinstatement	*Completion of installation activities*
	Commissioning	*Commence when first system installed, iron permit and EA permitting*
	Close out	*Start of commissioning*

Source: UUW systems. IM6 is in March 2030 .

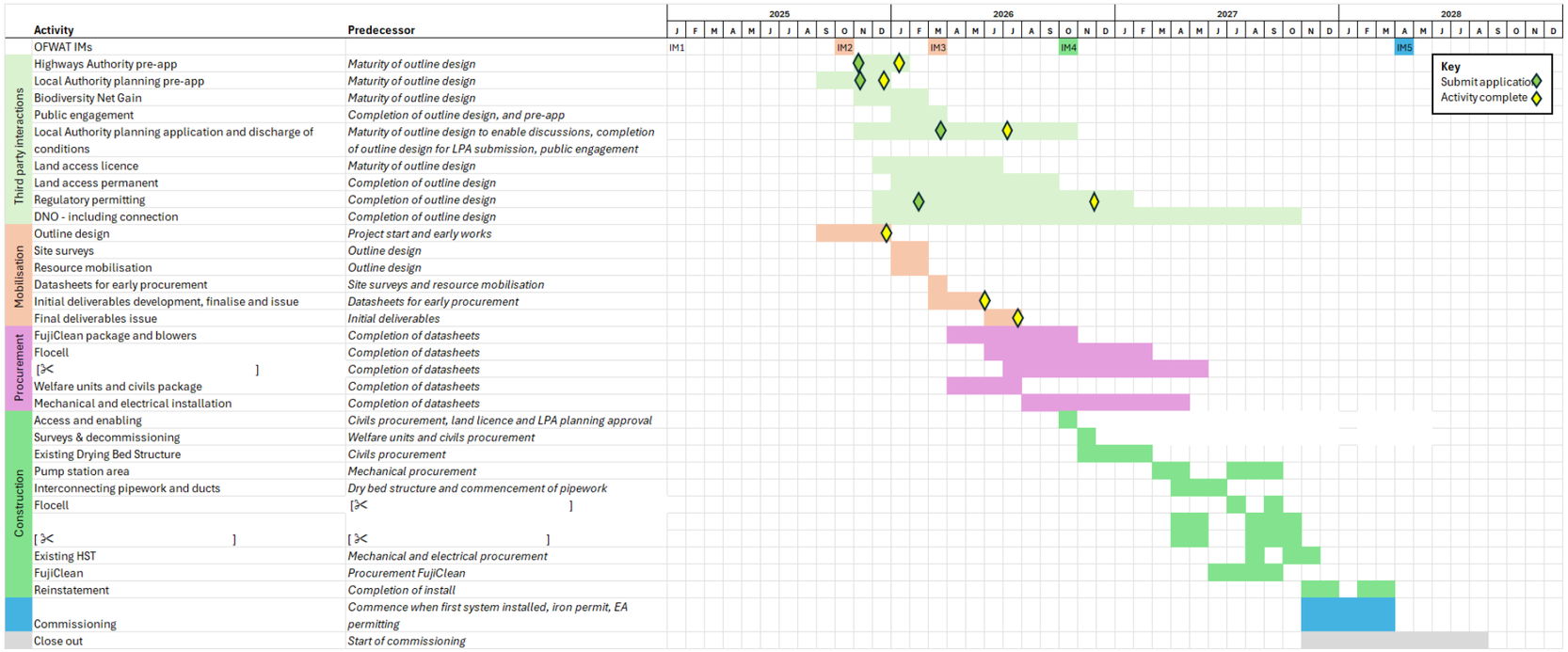
Figure 6: Near Sawrey – high-level programme summary



	Activity	Predecessor
	OFWAT IMs	
Third party interactions	Highways Authority pre-app	*Maturity of outline design*
	Local Authority planning pre-app	*Maturity of outline design*
	Biodiversity Net Gain	*Maturity of outline design*
	Public engagement	*Completion of outline design, and pre-app*
	Local Authority planning application and discharge of conditions	*Maturity of outline design to enable discussions, completion of outline design for LPA submission, public engagement*
	Land access licence	*Maturity of outline design*
	Land access permanent	*Completion of outline design*
	Regulatory permitting	*Completion of outline design*
Mobilisation	Outline design	*Project start and early works*
	Site surveys	*Outline design*
	Resource mobilisation	*Outline design*
	Datasheets for early procurement	*Site surveys and resource mobilisation*
	Initial deliverables development, finalise and issue	*Datasheets for early procurement*
	Final deliverables issue	*Initial deliverables*
Procurement	FujiClean package and blowers	*Completion of datasheets*
	Flocell	*Completion of datasheets*
	[✂]	*Completion of datasheets*
	Welfare units and civils package	*Completion of datasheets*
	Mechanical and electrical installation	*Completion of datasheets*
	Trace heating and lagging	*Completion of datasheets*
	Booster set	*Completion of datasheets*
Construction	Access and enabling	*Civils procurement, land licence and LPA planning approval*
	Access road	*Welfare units and civils procurement, highways and access and enabling*
	Pump station area	*Civils procurement, access road*
	Interconnecting pipework and ducts	*Mechanical procurement, starts following start of pump station area*
	Flocell	*Flocell procurement, mechanical and electrical procurement*
	[✂]	*Civils procurement*
	Existing HST	[✂]
	FujiClean	*Procurement FujiClean, mechanical and electrical procurement*
	[✂]	[✂]
	Reinstatement	*Completion of install*
	Commissioning	*Commence when first system installed, iron permit, EA permitting*
	Close out	*Start of commissioning*

Source: UUW systems. IM6 is in March 2030 .

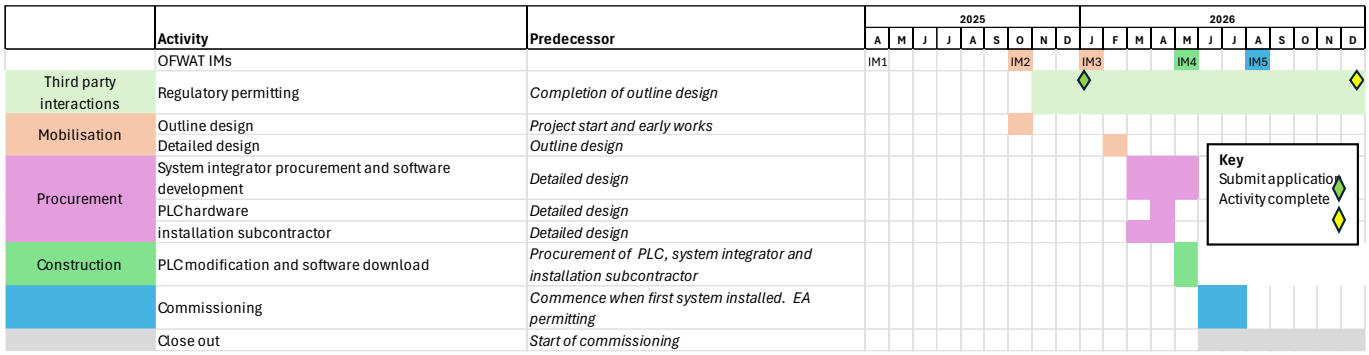
Figure 7: Far Sawrey – high-level programme summary



	Activity	Predecessor
	OFWAT IMs	
Third party interactions	Highways Authority pre-app	*Maturity of outline design*
	Local Authority planning pre-app	*Maturity of outline design*
	Biodiversity Net Gain	*Maturity of outline design*
	Public engagement	*Completion of outline design, and pre-app*
	Local Authority planning application and discharge of conditions	*Maturity of outline design to enable discussions, completion of outline design for LPA submission, public engagement*
	Land access licence	*Maturity of outline design*
	Land access permanent	*Completion of outline design*
	Regulatory permitting	*Completion of outline design*
	DNO - including connection	*Completion of outline design*
Mobilisation	Outline design	*Project start and early works*
	Site surveys	*Outline design*
	Resource mobilisation	*Outline design*
	Datasheets for early procurement	*Site surveys and resource mobilisation*
	Initial deliverables development, finalise and issue	*Datasheets for early procurement*
	Final deliverables issue	*Initial deliverables*
Procurement	FujiClean package and blowers	*Completion of datasheets*
	Flocell	*Completion of datasheets*
	[✂]	*Completion of datasheets*
	Welfare units and civils package	*Completion of datasheets*
	Mechanical and electrical installation	*Completion of datasheets*
Construction	Access and enabling	*Civils procurement, land licence and LPA planning approval*
	Surveys & decommissioning	*Welfare units and civils procurement*
	Existing Drying Bed Structure	*Civils procurement*
	Pump station area	*Mechanical procurement*
	Interconnecting pipework and ducts	*Dry bed structure and commencement of pipework*
	Flocell	[✂]
	[✂]	[✂]
	Existing HST	*Mechanical and electrical procurement*
	FujiClean	*Procurement FujiClean*
	Reinstatement	*Completion of install*
	Commissioning	*Commence when first system installed, iron permit, EA permitting*
	Close out	*Start of commissioning*

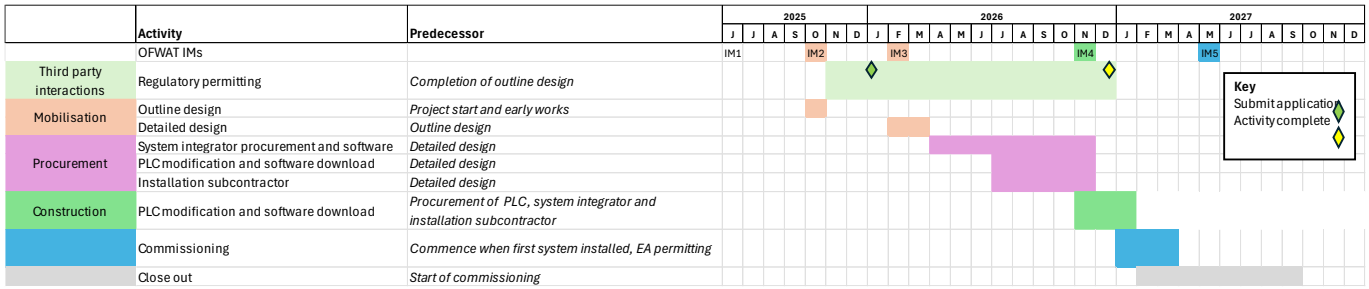
Source: UUW systems. IM6 is in March 2030

Figure 8: Grasmere – high-level programme summary



Source: UUW systems. IM6 is in March 2030.

Figure 9: Ambleside – high-level programme summary



Source: UUW systems. IM6 is in March 2030 .

6.3 Risk

6.3.1 Risks are managed in line with UUW's risk management procedure. The risk registers are now mature and fully aligned to the cost estimates and programmes included in this submission. Since submission one, the project teams have undertaken detailed risk workshops to identify all current project risks and assign probability and three-point price and programme impacts (minimum, most likely and maximum). As appropriate for the project value and complexity, we have included an estimated weighted average risk value in cost estimates.[14] This is broken down by scheme and risk category in Table 10.

Table 10: Risk breakdown by scheme and risk category (£m, 2022/23 CPIH prices)

Description	Troutbeck	Far Sawrey	Outgate	Near Sawrey	Grasmere	Ambleside
Land acquisition and access	0.046	0.001	0.010	0.005	0.000	0.000
Planning, control and consents	0.060	0.127	0.040	0.047	0.000	0.000
Environmental and weather	0.059	0.039	0.072	0.036	0.000	0.000
Infrastructure, operational and supporting services	0.007	0.000	0.000	0.006	0.000	0.000
Ground conditions	0.047	0.056	0.047	0.023	0.000	0.000
Technical performance	0.025	0.025	0.025	0.001	0.018	0.048
Commercial, procurement and contractor performance	0.020	0.018	0.018	0.020	0.004	0.002

[14] We have applied the PERT method to the minimum, maximum and most likely risk values to generate an estimated weighted average value for exposure.

Description	Troutbeck	Far Sawrey	Outgate	Near Sawrey	Grasmere	Ambleside
Project and programme management	0.007	0.000	0.000	0.000	0.000	0.000
Customer, public and other stakeholder	0.000	0.013	0.000	0.019	0.000	0.000
Total	**0.270**	**0.280**	**0.211**	**0.157**	**0.022**	**0.050**

Source: Risk registers for each scheme

6.3.2 The key categories of risk and how these risks have changed since submission one is described below.

Design risk

6.3.3 We have updated design risks in line with progression of the schemes through the definition phase .

Planning, control and consents

6.3.4 Design development has resulted in requirements for additional land,[15] as well as planning permission at Troutbeck and Outgate, which was identified as a risk in submission one and has now been incorporated into the programmes and cost estimates. The risks of extended approval times on planning applications, or that the planning conditions are more restrictive than assumed now apply to more schemes (three of four FujiClean schemes). We continue to engage closely with planning authorities and stakeholders to mitigate any delays or additional costs, including using pre-applications, as described in section 9.2.

Technical performance

6.3.5 In submission one we identified a risk around the outcome of flow surveys, and flow monitoring data has now been used as part of the design process. Given that flow data has been collected from August, the likelihood of this risk is reducing, and to mitigate any potential impact, modelling and design is based on a 1 in 30 year storm event.

Constructability risk

6.3.6 We described a series of constructability risks in submission one, which have been reviewed and updated in the light of further design work.

Land acquisition

6.3.7 Troutbeck , Outgate, Near Sawrey and Far Sawrey WwTW have limited land availability on the existing sites. Since submission one power resilience assets have been added to the solutions to avoid pollution risk. This has also led to the acquisition of additional land outside the site boundaries. We have engaged early with landowners (including the National Trust) where land purchase or lease is unavoidable to mitigate the risk of delay.

Access

6.3.8 Access for construction is limited at many of the sites as described in section 3. Where access is particularly challenging, we are working with stakeholders (including landowners) to mitigate the risk of delay. For Outgate there is no access road to the site, hence a new permanent access is required. In addition to negotiations for land to facilitate the access road, particularly boggy ground conditions need to be accommodated through design, for example drainage.

Environmental

6.3.9 Project sites may require special protections for environmental habitats which will require assessment for relocation, avoidance and potentially set-up of new habitats, which could lead to additional cost and time. On all sites we have undertaken ecology surveys to understand these requirements; surveys will remain ongoing before start on site and therefore a low/medium likelihood risk remains.

[15] See section 3for further details.

Power

6.3.10 For each of the sites the available power is inadequate for the design requirements for the new equipment, as set out in submission one. For example, a power upgrade is required at Far Sawrey which is “end of line” on the distribution grid. To mitigate this risk, we have requested new power connections from the DNO, and allowed for generators to be used (where required) until power supplies are in place. [✂

].

Construction risk

6.3.11 We described a series of construction risks in submission one which remain valid. The restricted nature of each of the sites has been exacerbated with the inclusion of additional power resilience assets, which has led to construction activities needing to be carried out in sequence rather than in parallel, and added time and cost as described in section 5.

Weather

6.3.12 Weather conditions in the Lake District can be particularly challenging and will be a factor throughout construction. Construction may be impacted by weather conditions, leading to delays and additional costs. To mitigate this, we will start on site during the drier months.

Ground conditions

6.3.13 Unforeseen or bad ground conditions could be encountered, resulting in difficulties during construction, increased programme delay and construction costs. To manage this risk. we have undertaken ground investigation surveys and the information has been used to inform design development and cost estimates. Further surveys are ongoing where permanent access routes are planned, such as Outgate.

Customer, public and other stakeholder

6.3.14 Farmers, landowners or other third-party stakeholders could be adversely affected by the construction. Near Sawrey WwTW is located close to the National Trust property Hill Top, Beatrix Potter’s farmhouse, which experiences large volumes of tourist traffic and is accessed by narrow lanes. Far Sawrey WwTW is located close to ancient woodland and Troutbeck WwTW has an existing public right of way and is located close to homes and holiday properties. We are engaging closely with local stakeholders and making plans to mitigate the impact of construction (e.g. traffic management planning for Near Sawrey).

6.3.15 Campaigners and or protesters could cause delays to the projects, which we have identified as a particular risk at Near Sawrey. This could also pose both a security and health and safety risk to the site and staff and could impact the project cost, schedule and reputation. We are monitoring activity around the sites, maintaining a high level of site security and engaging with the community.

7. Customer protection

7.1 Introduction

7.1.1 To safeguard customers and uphold confidence in delivering the Windermere enhancement schemes, we have proposed a set of Price Control Deliverables (PCDs) aligned with Ofwat's PR24 final determinations for similar areas of expenditure. The proposed PCDs will compensate customers if we fail to deliver or are late delivering our committed improvements. This section is supported by an Excel workbook (UUWLGS_P1S2_07 PCD workbook) which uses the structure and format of the PR24 FD UUW PCDs.

7.2 Approach

7.2.1 Following feedback from Ofwat on our submission one PCD proposals, we have changed the structure of our PCD proposals for submission and are now proposing to create two new discrete "Windermere" PCDs. These are:

- Phosphorus removal (PCDWW10_UUWLGS); and
- Sanitary Parameters (PCDWW12_UUWLGS).

7.2.2 The Phosphorus removal PCD (PCDWW10_UUWLGS) contains six schemes and the Sanitary Parameters PCD (PCDWW12_UUWLGS) contains four schemes.

7.2.3 We plan to consolidate the PCDs for all Windermere schemes in the final "Windermere" PCDs and not create separate PCDs for each package. Accordingly, we will propose updating these "Windermere" PCDs to incorporate the schemes from package two and subsequently package three.

7.2.4 The structure and requirements of the proposed large gated scheme PCDs follow those of comparable PCDs included in the PR24 final determination. For Phosphorus, PCDWW10_UUWLGS, therefore we propose that the PCD follows PCDWW10 set out in section 4.3 of "PR24 final determinations: Price control deliverables appendix".[16] For Sanitary Parameters, PCDWW12_UUWLGS, we propose that this follows PCDWW12 set out in section 4.5 of the same appendix.

7.2.5 Where the scheme is part of an expenditure area where Ofwat has applied time incentives in PR24 final determinations we have also proposed time incentives for the new large gated scheme PCD. This applies to the Phosphorus PCD only in package one submission two . The timing incentive rates are calculated in line with the FD:

- The timing underperformance rate is based on the company wholesale weighted average cost of capital (WACC) of 3.97%, multiplied by the unit allowance. For example, for phosphorus removal, the unit allowance is "Population Equivalent".
- The timing outperformance rate is set as one third of the underperformance rate, multiplied by minus 1.

7.2.6 We have provided an accompanying Excel workbook (UUWLGS_P1S2_07 PCD workbook). This follows the same structure as the final determination PCD "Wastewater scheme level" excel files[17]. For

[16] PR24 final determinations: Price control deliverables appendix, Ofwat, December 2024, https://www.ofwat.gov.uk/wp-content/uploads/2025/01/9.6-PR24-final-determinations-Price-control-deliverables-appendix_Redacted-1.pdf

[17] Available here: https://www.ofwat.gov.uk/wp-content/uploads/2025/06/PR24PCD113-Wastewater-Scheme-level-PCDs-v3.xlsx

reference, we have used the PCD workbooks published by Ofwat as of 13 June 2025. For this submission we have only included schemes in the Excel workbook relating to package one.

7.2.7 There is one line per site. Some sites have expenditure related to both PCDs; they are therefore added on to both PCDs in the Excel workbook with the relevant proposed cost allowance for that PCD. For simplicity, we have included our proposed totex estimate (£m) in the Excel workbook in the standard PCD column headed “Reconciled post adjustments and FS and RPEs allowance (£m)” but have not renamed the column header. Our proposed totex allowance has undergone an appropriate cost estimation process for the level of maturity of each scheme, detailed in section 5.2 of this document, which is equivalent in rigour to the methodology used by Ofwat to determine its "Reconciled post adjustments and FS and RPEs allowance (£m)" figures.

7.2.8 For this submission we have only included schemes in the Excel workbook relating to package one.

7.2.9 This proposal ensures customers remain protected against non- or late-delivery and provides regulatory alignment and clear and accountable reporting.

7.3 Proposed final PCDs

Phosphorus Removal

Approach to deliverable

7.3.1 The PCD proposed is in line with that applied in PR24 final determinations for similar areas of expenditure, related to achieving enhanced permits (consents) for phosphorus removal schemes (the relevant PR24 FD PCD is PCDWW10). The PCD will track delivery at the scheme level for the six phosphorus projects in package one and claw back allowed investment in the event of non-delivery, in line with the payment calculations set out in the FD Price Control Deliverables appendix.

7.3.2 We have included the proposed cost allowance for each scheme in the PCD, on a separate line for each scheme, excluding any development allowance already included in the FD PCD for that scheme. The PCD will hold UUW to delivering the schemes included in package one to meet tightened permit conditions (consents) for the enhanced permit of phosphorus removal schemes.

Flexibility across deliverables

7.3.3 We intend to deliver the proposed schemes. If we identify the need to substitute any of the agreed schemes, we will obtain the approval of the EA for this substitution and explain the reasons for any significant substitutions in our annual regulatory reporting. Regular programme updates will also be provided to Ofwat in our delivery plan submissions and quarterly large schemes meetings.

Time incentives

7.3.4 We propose time incentives on the cumulative PE (population equivalent) served consistently with the approach adopted in the PR24 final determination, i.e. applied at an aggregate level across the whole large gated scheme programme. This is shown in the accompanying Excel spreadsheet UUWLGS_P1S2_07 PCD workbook, line 17.

7.3.5 We propose a delivery profile for the PCD that reflects the planned timing of the Windermere schemes, all with delivery dates of 31 March 2030. Ofwat’s PR24 final determination applied a standardised profile for phosphorus schemes, assuming around two-thirds of cumulative Population Equivalent (PE) served would be delivered by year 4 (2028–29). This assumption is not appropriate for Windermere, where schemes will start later than most AMP8 phosphorus programmes due to Windermere’s inclusion in the gated process and where the six schemes are not part of the wider FD Phosphorus PCD, removing delivery flexibility.

7.3.6 Accordingly, we propose a Windermere-specific delivery profile, detailed in the accompanying Excel spreadsheet UUWLGS_P1S2_07 PCD workbook, line 20.

Sanitary parameters

Approach to deliverable

7.3.7 The proposed PCD is in line with that applied in PR24 final determinations for similar areas of expenditure, related to delivery of sanitary parameters enhancement schemes (the relevant PR24 FD PCD is PCDWW12). The PCD will track delivery at the scheme level for the four sanitary projects in package one and claw back allowed investment in the event of non-delivery, in line with the payment calculations set out in the FD Price Control Deliverables appendix.

7.3.8 We have included the proposed cost allowance for each scheme in the PCD, on a separate line for each scheme, excluding any development allowance already included in the FD PCD for that scheme. The PCD will hold UUW to delivering the schemes included in package one to tightened permit conditions for one or more sanitary parameters.

7.3.9 Development allowances for three of the schemes are already included in the FD PCD PCDWW12 (Excel cells I37, I40 and I41). As noted by Ofwat in the "PR24 final determinations: Price control deliverables appendix", this PCD is for tracking delivery of schemes. It does not track the delivery of the parameters in those schemes, unlike other PCDs, such as the Phosphorus Removal PCD. The schemes and the individual scheme parameters are therefore listed in both the FD PCD and this proposed PCD. However, the FD PCD is tracking delivery of the development allowance of the three schemes only. This proposed PCD is tracking delivery of the scheme itself.

7.3.10 The Outgate scheme, was not included in the FD Sanitary parameters PCDWW12. We have therefore added this scheme to the bottom of the proposed PCD for submission two.

Flexibility across deliverables

7.3.11 We intend to deliver all the proposed schemes. If we identify the need to substitute any of the agreed schemes, we will obtain the approval of the EA for this substitution and explain the reasons for any significant substitutions in our annual regulatory reporting. Regular programme updates will also be provided to Ofwat in our Delivery Plan submissions and quarterly large schemes meetings.

Time incentives

7.3.12 We do not propose time incentives for these schemes. This is in line with the comparable FD PCD, PCDWW12.

8. Procurement and operation model

8.1 Introduction

8.1.1 This section sets out the procurement strategy and approach to identifying a supply chain partner for the package one schemes, with a focus on the four larger FujiClean schemes. The assets will not be operated by a third party and will be operated by UUW as part of its wider operations.

8.2 Overview of procurement strategy

8.2.1 UUW refreshed its project delivery model and commercial contracts for AMP8 to include several "runways", and is using the "Enterprise" model for the Windermere programme.[18] Runways are different approaches to delivery including design and build, or build only, with delivery partners selected to suit projects of different complexity and size. The "Enterprise" forms one runway: it brought together eight industry-leading partners to deliver crucial environmental and infrastructure projects as part of AMP8. Enterprise partners work with UUW as one team, bringing together expertise in design, engineering, and construction to deliver projects safely, efficiently, and sustainably.

[18] For further details see UUW (2023), "UUW47 Deliverability – Capital Delivery and Supply Chain" and UUW (2024), "UUWR_82 – Area of representation: Other – Deliverability (Capital Delivery and Supply Chain"

8.2.2 We selected the Enterprise runway to allow the Windermere gated programme to be managed holistically, in order to ensure a consistent approach to project delivery and stakeholder management. We estimate that using the Enterprise approach has potentially generated a range of efficiencies, with an estimated value of up to £1.8 million relative to separately tendering each project, which is reflected in current cost estimates:

- Firstly, using the Enterprise model has allowed a range of technical experts, including supply chain partners, to be engaged throughout the design process;
- Using a single contract and delivery partner has also allowed both the contractor and UUW to drive efficiencies in their resources by sharing the same resources across the projects (for example sharing project managers), with an efficiency of up to £0.7 million;
- Finally, the combined approach has also generated potential efficiencies in design, by allowing extensive work on one site (Near Sawrey WwTW) on design options (different size units, above/below ground etc), to be used on the other schemes (Outgate, Far Sawrey and Troutbeck), evidenced by the lower cost to date on these three projects relative to Near Sawrey.

8.3 Identification of supply chain partner

8.3.1 Through its Enterprise runway described above, UUW has identified a supplier (C2V) to deliver the four FujiClean schemes in package one, providing a high level of capacity and capability.[19] C2V brings the combined strength of Jacobs and VolkerStevin, backed by more than 700 specialists in the northwest and direct access to a wider global workforce. It has delivered over £600 million of capital works for UUW across AMP6 and AMP7, demonstrating consistent performance in complex water and wastewater projects. Its team includes more than 70 MEICA, process and commissioning engineers, supported by a large multidisciplinary design capability covering civil, mechanical, electrical, ICA and process engineering, as well as geotechnical, environmental and carbon expertise. This depth of technical resource allows C2V to manage full design-and-build delivery, from early optioneering through to system integration and optimisation at takeover.

8.3.2 As an appointed AMP8 Enterprise Partner, this capability has already been externally verified through UUWs rigorous procurement process. C2V brings proven experience in treatment process upgrades, network resilience, pumping systems, bioresources, storage and energy schemes, underpinned by strong digital engineering, BIM modelling and whole-life asset thinking. Its track record includes the successful deployment of innovative solutions such as Nereda, IFAS, MBBR, UV treatment and modular construction to reduce cost, carbon and programme risk. This combination of specialist resource, mature delivery systems and long-standing performance for UUW gives confidence in C2V's ability to deliver the Windermere FujiClean programme efficiently and safely. C2V has been allocated these schemes and is preparing to deliver them.

[19] The Ambleside and Grasmere phosphorus schemes will be delivered by a different supplier (RSE Control Systems (TCS)) given the nature and size of the schemes.

9. Stakeholder and customer engagement

9.1 Introduction

9.1.1 This section describes engagement with relevant statutory bodies, the latest status of planning applications and discussions with the EA and our wider stakeholder and customer engagement approach. This reflects a high level of engagement with all relevant stakeholders, underpinned by regular engagement between stakeholder and project teams to ensure accurate communications and timely flow of information. We provide the Customer and Stakeholder Engagement Plan (CSEP) as a supporting document (UUWLGS_P1S2_07).

9.2 Pre-planning investigations and planning applications

9.2.1 At submission one we anticipated that planning permission would be required at Near Sawrey WwTW and for the access road at Outgate WwTW. However, during final outline design, it was confirmed that planning permission is required to extend the existing WwTW at Troutbeck, Outgate and Near Sawrey to accommodate the additional power resilience assets and ensure space is available for safe operation and maintenance. At Far Sawrey, final outline design identified the need for an additional compound area to facilitate safe construction. This compound is not adjacent to the site so will require planning approval.

9.2.2 All package one schemes have been reviewed by the LDNP, the local planning authority, and our current view of planning permissions required is included in Table 11 and reflected in the programmes set out in section 6. A planning pre-application was submitted for Near Sawrey WwTW prior to submission one and feedback has supported design development, particularly with the semi-submerged solution. Since submission one pre-applications have been submitted for Troutbeck and Outgate WwTW.

9.2.3 Pre-application advice has been received for Troutbeck and Near Sawrey WwTW which endorsed our approach to the designs and assessments. For Outgate WwTW we are expecting a similar response.

Table 11: Package one projects planning permission summary

Project	Planning Permission Summary
Troutbeck WwTW	Pre- application advice submitted and response received Dec 2025 Planning permission required for WwTW extension. To be submitted March 2026
Outgate WwTW	Pre-application advice requested and a response expected early in 2026 Planning permission for WwTW extension and new access to be submitted March 2026
Near Sawrey WwTW	Pre-application advice received. Planning permission required for WwTW extension. To be submitted March 2026
Far Sawrey WwTW	Formal pre-application advice not required Planning permission required for the temporary compound area only. To be submitted early 2026
Grasmere WwTW	Planning application not required
Ambleside WwTW	Planning application not required

Source: UUW summary

9.2.4 At Near Sawrey WwTW the National Trust is a key stakeholder and design review meetings have been held to secure its inputs, in particular from a heritage and landscape perspective (for example with respect to the colour and materials for the control kiosks/buildings).

9.2.5 As outlined in Section 4.2 all schemes have been discussed with Natural England through our programme wide Discretionary Advice Service Agreement. This has informed the design and assessment process. HRAs will accompany the planning applications at Outgate and Near Sawrey WwTW.

9.2.6 In addition to the formal pre-application process we have engaged with local communities, parish councils and groups such as Friends of the Lake District as outlined in section 9.3. Wider public consultation, including parish council engagement and public consultation events, is planned in conjunction with the Stakeholder and Customer team and is detailed in the CSEP.

9.3 Environment Agency engagement

9.3.1 We have maintained our engagement with the EA, meeting with the Integrated Environment Planning Team approximately fortnightly to provide updates on solution development and finalise key areas such as sanitary requirements at Outgate WwTW.

9.3.2 Through this engagement we have shared and discussed key information for package one projects, such as single solution papers for all sites and trial data associated with FujiClean technology. We have also worked closely with the EA to identify remaining sanitary requirements at Outgate WwTW and have formalised these into the WINEP (as set out in UUWLGS_P1S2_10). With all requirements reflected in the WINEP we can progress permitting of package one projects through processes such as permit variations, which can offer a more efficient route to secure permits.

9.3.3 Our engagement with the EA has covered the full Windermere gated programme, including later package three projects, to ensure a robust and efficient outcome regarding solutions and sign off.

9.3.4 As set out in UUWLGS_P1S2_13, single solution papers have been shared with the EA through our engagement and the EA is supportive of the works planned to achieve improvements. We will continue to engage the EA regularly as we progress through future packages and into scheme delivery.

9.4 Stakeholder and customer engagement

9.4.1 United Utilities has a clear stakeholder and community engagement plan and dedicated resources within the community to execute that engagement across the Windermere catchment, with the objective of being a trusted partner, demonstrating it is delivering on the community's priorities, understands the community's needs and expectations and is keeping them informed. The objective is to work effectively and constructively with others to mitigate the impact of any activities, support and undertake the necessary consultation as part of the planning process and help ensure the feedback from that engagement is reflected to avoid objections and delays. This engagement plan has been in place prior to business plan submission and will underpin delivery throughout AMP8.

9.4.2 This section outlines the approach to stakeholder and customer engagement for the Windermere programme. In support of the overview provided in this section, a detailed list of the interactions across customer, stakeholder, third party liaison and alignment with the planning process are captured in this plan. The Customer and Stakeholder Engagement Plan (CSEP) has been updated since submission one and is set out in UUWLGS_P1S2_08.

Principles for engagement

9.4.3 Customers across the northwest supported UUW's PR24 business plan proposals and where it had strengthened its commitments in issues of high concern, such as pollution. Notwithstanding that support and its importance to delivering on those improvements in Windermere for communities and visitors, it is important we can deliver on those commitments in a way which minimises the disruption to the daily lives of all who live, work or visit the catchment. Demonstrating progress against those plans and benefits being realised is also key. Therefore, core principles which underpin the engagement strategy overall and through the lifecycle of each project include:

- Raising awareness of what we are planning and are doing among the community and how this will support their priorities in terms of the service they expect and pay for from United Utilities and how improvements will contribute to the broader health and wellbeing of Windermere;
- Undertaking pre-application discussions with statutory bodies, such as Lake District National Park, Natural England, the Environment Agency and Westmorland and Furness Council's Highways team and building their requirements into our designs from an early stage;
- Supporting those customers and communities throughout the lifecycle of a project with help and information and opportunities for them to raise their concerns and issues directly with us;
- Executing a proactive programme of contact with key stakeholders, community campaigners and the local MP;
- Being visible among the community, through our physical presence with an information centre in Windermere, at community events and through open access for them to come and see for themselves how we treat and manage wastewater at our site; and
- Gathering feedback to adapt and improve what we do and how we do it, underpinned by a Windermere specific brand survey conducted on a quarterly basis with households and businesses in the catchment to track and measure sentiment.

9.4.4 The team leading that engagement includes a dedicated area engagement lead who manages stakeholder relationships with key local authorities, MPs and other strategic bodies across Cumbria and in Windermere; a Windermere specific catchment manager responsible for the liaison and consultation with regulators; and a third party and communications team who work within the local communities where we are making the investment and carrying out the work to consult, inform, support and help mitigate any risks caused by that work. This team works closely with broader colleagues accountable for planning and land management and the capital delivery and construction teams to ensure there is a cohesive and proactive programme of engagement. Specific community engagement to support Windermere package one schemes

9.4.5 When it comes to executing our engagement with those affected by site specific plans and activity, more detailed stakeholder mapping is undertaken to ensure we are liaising with all those affected or interested in a particular location. This includes reaching out to existing stakeholders and community groups to confirm we are including everyone that will have an interest. That engagement is helping us to shape and adapt our plans and mitigate the impact on the community or sensitive locations.

9.4.6 The below reflects examples of the most recent engagement in relation to each of the schemes in package one and is an update of similar information provided in submission one.

Troutbeck

9.4.7 There is ongoing and regular engagement with the community of Troutbeck, both about the upgrade to the treatment works in the village, part of this package 1 submission, and because of wider interest from this community in connecting to the mains sewer system through the first-time sewerage process.

9.4.8 A well-attended public event was held in October at which both the investment and work at the treatment site was discussed alongside information and an update on how to apply for connection to the mains sewer given the level of interest in the village. UUW has established regular contact with this community, through direct information to customers, through the route of the elected parish councillor and via a representative of the broader community who helps share updates and news to the community.

9.4.9 A further public session was held on 15 December. A film has been made of the installation of a temporary FujiClean unit on this site which took place in October, which will be used in communications to the community, helping to demonstrate the technology and how it is helping improve treatment standards, as well as how it can help overcome the difficulties of engineering activity in a sensitive location with small roads and tricky access conditions.

Outgate

9.4.10 In support of enabling works needed on this site, which also has challenging access conditions, there has been direct engagement with landowners, their tenants, the parish council and customers about what was needed and to understand and support any concerns. These discussions involve identifying what might be the best route to create a new access road which would facilitate the improvements needed at the site and access resilience in the longer-term, especially during winter.

9.4.11 The next milestones will be a public session in January as part of the parish council meeting, and specific individual engagement with landowners as part of the consultation to support for the required planning application.

Near and Far Sawrey

9.4.12 Updates have been provided to the parish council which have included progress on work to improve power resilience and activity including the need for peat surveys. We have also consulted specific landowners, including the National Trust and a major estate, on the detail around the spill reduction aspect of the improvement work (not part of the gated programme) and the plans for sustainable urban drainage and surface water separation at Near Sawrey. Wider public consultation will begin in early March ahead of a formal planning application.

Grasmere:

9.4.13 Public interest in terms of Grasmere is more generally focused on the outcome of the work which will reduce spills from the storm overflow and remove surface water infiltration, given the wider focus in the community on the area's longer-term flood resilience. To date, in more general engagement we have focused on the overall solutions for Grasmere – so outlining both the spills driver focused investment and the upgrade to the treatment works to further reduce phosphorus, which will ultimately benefit water quality in Windermere. This has included updates in the community newsletter, highlighting activity such as ecology surveys or network surveys which would be visible to residents while the work at the treatment works itself is not.

9.4.14 We also took the opportunity to update the community at an event in the village in early December which, while focused on flood resilience and involving other organisations such as the EA and Natural England, meant we could discuss the immediate work to improve treatment standards at the works, as well as discuss the later phase to reduce spills and remove surface water infiltration of the sewer network.

Ambleside

9.4.15 Similar to Grasmere, while the plans in package one relates to the upgrade to the treatment works to meet phosphorus drivers, the community's interest has been in the investment overall which involves creating extra stormwater storage capacity (not part of the Windermere gated programme). Building on the previous engagement highlighted in submission one, the relationships we have developed within the community have continued through a number of regular meetings to keep in touch, share progress and answer any queries.

9.4.16 Updates have also been provided to the local Liberal Democrat councillor, then shared more widely with broader councillors and members of Westmorland and Furness Council, as well as with the area's MP.

9.4.17 UUW meets regularly with an active citizen science group, Ambleside Action for a Future, with a keen interest in understanding how water quality in Ambleside and the Windermere catchment can improved. At the most recent meeting in October, UUW shared an update on the work at Ambleside which received a positive response.

9.4.18 While not part of the gated programme, the parish council has indicated it has no objections to UUW's plan for an above ground solution for stormwater storage on the site, which is testament to the positive work to engage the community on what was required and its benefits overall. Examples of all the recent engagement are within the CSEP.

9.5 Engaging our communities

9.5.1 The approach to engaging the community across the Windermere catchment and those with a particular interest in Windermere is driven by an 'always on' element to our wider communications – so alongside having a physical presence in Windermere where updates and information are available we produce a regular newsletter which is issued to residents, highlighting our ongoing work and future plans, as well as demonstrating examples of how we are working with others to improve water quality. The 'always on' activity includes regular attendance at community led events across the calendar year where there is an opportunity to engage with the public, alongside use of other channels, such as social media, to share regular updates and information. We use partner channels to expand the reach, for example, we use the Love Windermere partnership which has representatives from organisations such as Westmorland and Furness Council, the Lake District National Park Authority, Cumbria Tourism, businesses, the National Trust and Lake District Foundation to help inform, update and gather feedback.

9.5.2 In terms of wider community stakeholder engagement, there is an ongoing schedule of updates and meetings held with key organisations, elected members and officials and the local MP where we can consult on and discuss the investment plan, its intended outcomes and its proposed solutions and timelines.

9.5.3 Engagement also extends to interested community bodies and campaigning groups, such as Love Windermere (of which UUW is a member), Save Windermere and Ambleside Action for a Future and groups like the Lake District Hoteliers Association and a business sub-group of the Love Windermere partnership with whom we have had regular meetings.

10. Assurance

10.1.1 This section summarises UUW's approach to assuring this submission and the outcomes of the third party assurance. It is supported by UUWLGS_P1S2_02 Technical Assurance Report, UUWLGS_P1S2_03 Commercial Assurance Report, and UUWLGS_P1S2_04 Benefits Report, our third party assurance reports.

10.1.2 Ofwat requires gated submissions to include a third-party assurance report in line with the requirements set out in PR24 final determinations: Expenditure allowances - assurance requirements for delivery of enhancement schemes appendix. This includes technical and commercial assurance across the content of the gated submission, including assurance of material change included in the change log.

10.1.3 Since confirmation of the gated submission requirements in the June 2025 large schemes guidance (refined in August 2025), UUW has developed an approach to meeting these requirements and assuring each element of the submission. This includes risk assessing each chapter of the submission and each supporting document to determine assurance requirements. We are following our standard three lines of assurance approach to produce, review and sign off each element of the gated submission. The third line assurance has been provided by Jacobs in line with Ofwat's requirement for a third party assurance report.

10.1.4 Jacobs has provided three final reports covering technical, commercial and cost-benefit assurance, with no material issues raised. Key findings include:

- Technical assurance: Jacobs considers that the completed designs continue to address the risks identified at PR24, the increase in scope for power resilience since submission one is appropriate to address power issues in the area, and that an appropriate PCD has been designed.
- Commercial assurance: Jacobs concludes that the final scheme costs are appropriate and the costs for the selected solutions are efficient.
- Cost-benefit assurance: Jacobs concludes that UUW has applied a valid methodology and the schemes audited demonstrate a positive benefit cost analysis.

10.1.5 Further details of Jacob's approach and findings can be found in UUWLGS_P1S2_02 Technical Assurance Report, UUWLGS_P1S2_03 Commercial Assurance Report, and UUWLGS_P1S2_04 Benefits Report

11. Efficiency of expenditure to date

11.1 Introduction

11.1.1 This section sets out a breakdown of costs incurred in respect of package one, split between submission one and two. We provide an aggregated view of cost across all six package one projects to date and a forecast of the development costs we will incur before commencement of scheme delivery. We go on to compare this expenditure to the development allowance for package one.

11.2 Actual and forecast expenditure

11.2.1 Table 12 shows our development costs for package one, disaggregated to show submission one, submission two and forecast costs to the end of the definition phase. To ensure no overlap between the reported costs for submission one and submission two – given submission one was a progress update on the same workstreams that have fed in to submission two, all expenditure prior to August 2025 month end is recorded against submission one, and all expenditure during September and October is recorded against package two, with expenditure between November and the start of the delivery phase recorded in the forecast.

Table 12: Actual and forecast development costs aggregated across all six package one projects (£m, 2022/23 CPIH prices)

Ref	Scope item	Scope description	Submission 1 costs	Submission 2 costs	Forecast costs	Total
1	Main Contractor (Direct)	Contractor costs to complete project feasibility work to date	0.65	0.01	0.56[20]	1.22
2	Resource	UUW staff costs to complete project feasibility work to date	0.48	0.13	0.16	0.77
3	Surveys	Surveys to determine the solution e.g. ground investigation and ecology surveys	0.07	-0.01[21]	0.00	0.06
4	Third party (other)	Planning / licences and legal fees (etc)	0.01	0.00	0.00	0.01
	Total		**1.21**	**0.14**	**0.72**	**2.07**

Source: Actuals - UUW finance data, forecasts - UUW estimating data

11.3 Comparison against development allowance

11.3.1 UUW's costs up to submission two of £1.35m (£1.21m for submission one and £0.14m for submission two) exceed the total development allowance for package one of £0.81m, and including costs to the end of the development phase are likely to be more than double the development allowance. However, this expenditure is captured within the overall totex estimate for package one, which as described in section 5.2 are below Ofwat's cost models overall. Furthermore, following development of the schemes, package one costs have increased since the six per cent development allowance was calculated at final determinations.

11.3.2 The high proportion of development costs relative to package one totex reflects that there is a fixed element of project development costs that does not vary with the size of the project, and package one projects are small relative to other projects in the Windermere programme (e.g. the larger package two projects).

11.3.3 As at submission one, the combined development costs for packages one and two were forecast to remain within the combined development allowance following submission two for each package. Submission two for package two will be made in spring 2026, and will include an update on this position.

[20] A significant proportion of forecast main contractor costs reflect costs incurred prior to making this submission but after the data cut-off

[21] The negative survey cost for submission two reflect the replacement of an accrual with actual costs.

12. Conclusion and recommendations

12.1.1 UUW has developed the preferred option for each of the package one schemes as described in this submission, reaching a final outline design for each scheme. Designs consider solution resilience, access, maintenance, commissioning, handover and operability of the new assets, and have allowed the development of detailed programmes and cost estimates. Given the maturity of development of the package one schemes we propose all now progress to delivery following this submission, which we have prepared to support Ofwat's package one funding decision as part of the 2026 cost change process.

12.1.2 This submission reflects developed outline designs, robust and detailed programmes and cost estimates, and mature risk registers. To protect customers from non-delivery, we have proposed Windermere-specific PCDs following Ofwat feedback on submission one. We have worked to mitigate risks as far as possible, and remaining risks relate to outstanding planning permissions, power requirements, and construction risks:

- Planning – we are engaging regularly with planning authorities to mitigate the risk that planning conditions are imposed which are more onerous than we currently anticipate, now that we have established there is a need for planning on three of the six sites;
- Power- to mitigate risks around power requirements, we are engaging with Electricity North West and putting in place[✂] to avoid any delay in proceeding to construction; and
- Construction – given the location of the sites, there is a risk that adverse weather conditions delay or extend construction and lead to additional costs. We are addressing these risks by planning to begin construction in drier months. However, for Near Sawrey in particular, this leads to a risk around traffic management due to tourist volume, which we will manage using traffic management planning and stakeholder engagement where required.

12.1.3 The next stage in the project lifecycle is detailed design, which we expect to complete for Troutbeck and Outgate in May, and for Near and Far Sawrey in August 2026. We expect to start on site first at Troutbeck and Outgate, both in June 2026. The Grasmere and Ambleside projects will also both start on site in 2026, in Q2 and Q4 respectively. In parallel to delivery, we will continue to engage with stakeholders and progress the required planning applications in early 2026.

12.1.4 There continues to be a wider strategic risk around the political and campaign focus on Windermere, and the potential for longer term goals to distract from the short-term benefits being delivered by these projects. UUW is committed to the government's "only rainwater" vision. However, given this will take significantly longer to deliver than the more immediate improvements described in this submission we strongly believe the package one schemes need to go ahead as quickly as possible. This will maximise benefits for residents, businesses and visitors to Windermere while longer term plans are formed.

12.1.5 There is also the potential for current or future first time sewerage schemes to interact with the improvements described in this submission; again we believe that waiting for the outcome of these applications and the potential receipt of future applications will delay the realisation of benefits around Windermere to the detriment of local communities, businesses and residents. On this basis, we propose to proceed to deliver the package one projects at the earliest opportunity.

13. Supporting Documentation

13.1.1 To support this submission, we are providing several documents as indicated in the chapters above.

- A glossary (UUWLGS_P1S2_09 Glossary of terms);
- Schemes included within package one of the Windermere gated programme (UUWLGS_P1S2_10 Included Schemes);
- An EA letter of support (UUWLGS_P1S2_12 EA Letter);
- Change log covering all package one projects (UUWLGS_P1S2_06 Change Log);
- A set of data tables (UUWLGS_P1S2_11 Data tables); comprising:
  - Final delivery plan covering all package one projects
  - CWW19; and
  - ADD17.
- A data tables commentary (UUWLGS_P1S2_12_Data table commentary).
- PCD workbook covering package one (UUWLGS_P1S2_07 PCD workbook);
- Customer and stakeholder engagement plan covering all package one projects (UUWLGS_P1S2_08 Engagement Plan);
- Third party assurance reports (UUWLGS_P1S2_02 Technical Assurance Report, UUWLGS_P1S2_03 Commercial Assurance Report and UUWLGS_P1S2_04 Benefits Report), and letter of reliance (UUWLGW_P1S2_05 Letter of reliance); and
- A package of site-specific documents for each scheme (Troutbeck, Outgate, Near Sawrey, Far Sawrey, Grasmere and Ambleside) comprising:
  - Single solution paper;
  - Cost estimate;
  - Risk register;
  - P6 programme.

United Utilities Water Limited
Haweswater House
Lingley Mere Business Park
Lingley Green Avenue
Great Sankey
Warrington
WA5 3LP

unitedutilities.com

United Utilities

Water for the North West