
Appendix

YKY39_Living with Water Enhancement Case

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YorkshireWater

Navigating this document



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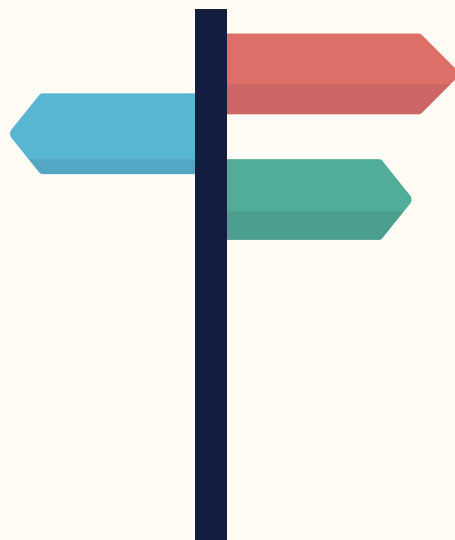
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Business plan links

This icon can be clicked on to go to the main Yorkshire Water Business Plan document where more information can be found.



More detail on this subject can be found in [Chapter 8 Part 2: What our plan will deliver](#)



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1. Living with Water Enhancement Case

- Investment of £26.3m in measures to increase flood resilience in Hull and surrounding areas as part of a long-term partnership plan to achieve a flood risk resilience improvement of 80% (based on 1 in 5-year internal property flooding in 2080).
- Hull and surrounding areas are completely reliant on the combined sewer network for drainage. 88% of all water that falls in the catchment, including several watercourses, is drained via Yorkshire Water's terminal pumping station, meaning that in this unique circumstance, we play a critical role in the regions flood resilience.
- Climate change means that the number of properties at risk of regular internal flooding (1 in 5 years) will increase by 250% by 2080. The impact of climate change is outside of management control, and it is essential that the coming period allows the Living with Water Partnership to build on existing momentum to facilitating long-term sustained investment. Any delay will exacerbate the costs and the consequences for this climate vulnerable location. The AMP8 proposal seeks to deliver adaptation measures to one of the most flood vulnerable areas of the UK.
- The AMP8 proposals builds on the existing AMP7 partnership programme of work to deliver flood risk reduction across the city. The AMP8 activity will set the foundations for a long-term approach to create several new surface water networks across the catchment which will relieve capacity in the combined sewer network. The investment of £26.3m will create significant enabling infrastructure in the 'west network', one of the most vulnerable areas of the city. The AMP8 investment will result in a flood resilience benefit of 2%.
- The Blue Green Plan is a low/no regrets approach as it is modular and therefore all elements complement each other but can also be deployed in isolation. This facilitates both a long-term strategic approach and supports opportunistic interventions.
- The long-term approach focusses on a balance of blue-green and grey infrastructure.
- The majority of customers found our business plan with this scheme included at £26.3m to be acceptable – 78% (following Ofwat's affordability and acceptability testing approach)
- Multiple tools have been used to assess the benefits of the AMP8 investment including our six capitals approach alongside best practice external tools such as CIRIA B£st tool and the Flood Damages Avoided Tool as set out in the EA's Flood and Coastal Erosion Risk Management Appraisal Technical Guidance.
- We used the best available industry data to benchmark our Sustainable Urban Drainage Systems (SuDS) costs to ensure we are delivering an efficient unit cost per hectare.
- The expected partnership funding will improve resilience for customers and communities, but the partners will incur their costs in activities outside of our statutory responsibility.
- Customers will be protected through a Price Control Deliverable (PCD). Whilst our expenditure for LWW is below the 1% materiality threshold, we propose to implement a PCD due to the low oversight of project delivery from other regulated bodies. The PCD will safeguard customers against under-delivery of our flood mitigation programme.

1.1 Driver: Wastewater Resilience

1.1.1 Requested Investment:

Table 1.1: Living with Water AMP8 Expenditure

	£m	Table Line Ref.
Enhancement Expenditure Capex	25.00	CWW3.181
Enhancement Expenditure Opex	1.25	CWW3.182
Base Expenditure Capex	N/A	
DPC value	N/A	
Total	26.25	

Associated Reporting lines in Data Table 1.2: CWW3 Reporting Lines

Reporting line	Line Description
CWW3.181	Living with Water capex
CWW3.182	Living with Water opex

1.2 High Level Driver description:

Hull and the surrounding area is at risk from extreme flood events and the communities here are *amongst the most vulnerable to climate risks in the UK (Coulthard 2007)*. In June 2007, very high rainfall led to surface water flooding in Hull which damaged approximately 8,600 residential properties, 1,300 businesses and 91 schools. The national economic impact of the 2007 floods was £3.2bn, Hull and East Riding were two of the four local authority areas in Yorkshire which suffered major damage and disruption.

In Hull 88% of all surface water drains into the combined sewer system, this includes a number of small water courses, and the city is completely reliant on pumping (at Yorkshire Water’s (YW’s) terminal sewage treatment works). In addition to a complex drainage network, the geography and topography of the region exacerbate the challenges of flood resilience.

The unique challenges faced in the Hull catchment underpin the essential need for Risk Management Authorities (RMA) to work together. The Living with Water Partnership (LWW) is a collaboration between YW, Hull City Council, East Riding of Yorkshire Council and the EA who each have responsibilities for managing different aspects of flood risk in the area. The University of Hull is LWW’s academic partner and have a position on the Board.

The aspiration of the LWW partnership is to create a city that thrives with water. Key to achieving this is the introduction of sustainable solutions that manage water visibly on the surface. The long-term ambition of LWW is to deliver holistic, integrated solutions that balance blue-green and grey infrastructure to manage surface water in the city alongside wider local priorities. The most optimal solution for the communities that live here is one which is co-developed and co-delivered to ensure best value and maximise wider benefits for customers and communities.

Our approach has been to work collectively across multiple disciplines within the partnership to develop the Living with Water Blue Green Plan. This is a 25-year strategy to address flood risk in Hull through investment in infrastructure, adaptation, and policy change, underpinned by a cultural alignment across the partners to deliver a shared vision.

The Living with Water Blue Green Plan proposes a catchment scale approach for surface water management in Hull and the surrounding area. The inputs into the sewer network include land drainage, water courses, road and property drainage - as such the responsibility for management spans the partnership. The aim of the Blue Green Plan is to work holistically to address the challenges that the current drainage network poses, in partnership.

The Plan has been developed with LWW partners and wider stakeholders. Over 70 members of the partner organisations attended two LWW Blue Green Plan charette's which enabled key stakeholders to understand the challenge and help shape the plan for the future. Three councillor engagement sessions have provided the opportunity for over 30 council members to input into the Blue Green Plan's creation. 48 young people attended a Hull Youth Parliament which collected views and feedback on Hull's Blue Green Plan for the future. Eight key local businesses attended a Business Breakfast event to understand the direction of the Blue Green Plan and how local business leaders can support this.

The Blue Green Plan proposes a series of measures over the short, medium and longer term focussed on source control and surface water disconnection. The estimated costs of implementing the full long-term solution are in the region of £1.5billion. Co-investing and co-delivering alongside other local priorities would lower this cost estimate.

In AMP7 LWW is delivering a significant portfolio of Blue-Green Infrastructure projects in line with the LWW Performance Commitment (PC). This has enabled extensive learnings which will be embedded into future programmes; the project has pushed the boundaries of partnership working, retro-fitting SuDS and complex modelling and has identified significant challenges around timescales, resource requirements, funding and competing policies and processes set by funders and regulators. The knowledge and experience gained in AMP7 has ensured a measured level of ambition for the programme in AMP8.

1.3 Need for investment

1.3.1 The Need for the Proposed Investment

Hull is the second biggest flood risk in the UK, there is a compelling need for risk management authorities to work together to address this risk now and into the future. For Yorkshire Water, this means working collaboratively as part of Living with Water to improve our service to customers whilst supporting our partners to co-deliver and co-invest to manage surface water holistically within the catchment.

Set out below are the following:

- the evidence base
- the expectation of government bodies
- the customer and stakeholder support.

Living with Water utilises a comprehensive 2D model which has been enhanced over a number of AMPs with significant upgrades made in AMP7 to incorporate a series of global updates associated with the investment programme – survey data (including topographic information), as built information from previous Lead Local Flood Authority schemes, improved ground water modelling and improved watercourse modelling.

This modelling identifies the extent of surface water flood risk within current conditions and with the impact of climate change. Using advanced modelling techniques, we have identified that the number of properties at risk of regular internal flooding (1 in 5 year) will increase by over 250% by 2080 and those properties at risk from severe storms (1 in 75 year) will almost double. The most recent and comprehensive modelling for Hull has been independently audited by Sutlow Dobbs and the Environment Agency. Hull suffered catastrophic flooding in 2007 and this has been used to verify the model.

Table 1.3: Internal Property Flood Risk Counts (Living with Water Hydraulic Model)

Model Name	1 in 5 yr. (20%)	1 in 20 yr. (5%)	1 in 30 yr. (3.3%)	1 in 75 yr. (1.3%)
Baseline - 2025	1,942	6,617	8,585	14,325
Baseline - 2080	5,131	14,508	18,013	26,511

The LWW approach aligns to both the Government’s ‘water industry strategic environmental requirements’ (WISER) and the 2022 National Infrastructure Commission (NIC) report: ‘reducing the risk of surface water flooding’.



Read more about WISER at www.gov.uk/government/publications/developing-the-environmental-resilience-and-flood-risk-actions-for-the-price-review-2024/water-industry-strategic-environmental-requirements-wiser

WISER outlines that making sure water company infrastructure is fit for the country’s long-term needs is a vital part of ensuring resilient places and communities.

The requirements state:

The government’s long-term ambition is to create a nation more resilient to future flood, coastal erosion, and extreme weather and to reduce the risk of harm to people, the environment, and the economy. The National Flood and Coastal Erosion Risk Management Strategy for England describes what needs to be done by all risk management authorities involved in flood and coastal erosion risk management for the benefit of people and places.

Water companies should have a clear understanding of the full range of risks related to the services they provide, both now and in the future. Water companies should use adaptive approaches to maintain a focus on the long term and work with others to take a systems view to analyse risks and identify, develop, fund and deliver schemes to improve resilience and deliver wider benefits.

Water companies should:

- *strengthen the resilience of the water supply and waste water and drainage services provided to customers, as well as the resilience of natural assets (such as soils, freshwaters, coasts, estuaries, seas and species) to risks posed by extreme droughts and floods, climate change and population growth*
- *help create climate resilient places and improve the resilience of communities to droughts, floods, and coastal change by implementing cost-effective, co-funded solutions*

The NIC report focusses on the impact of climate change and surface water flooding, noting that ‘The various components of a drainage system are designed to achieve different levels of performance, based upon sector specific codes of practice and standards, rather than to achieve a common outcome in terms of risk reduction’. Working collaboratively to focus on creating the most appropriate solution to serve communities, LWW is attempting to address this.



Read more about the NIC report at <https://nic.org.uk/studies-reports/reducing-the-risks-of-surface-water-flooding/surface-water-flooding-final-report/>

Of water companies, the NIC report suggests:

‘Water and sewerage company assets will have a key role to play in reducing the risk of surface water flooding in future, through both improvements to below ground drainage systems, and delivering further above ground interventions that can relieve pressure on pipes and sewers.

However, water and sewerage companies are currently not encouraged to address surface water flooding, and water and sewerage company investment has typically focussed on pipes and sewers, rather than above ground interventions. The analysis for this study shows that there will need to be significant enhancements to the capacity of below and above ground drainage infrastructure to reduce the risk of surface water flooding over the next 30 years. A large part of this investment will need to come from water and sewerage companies to ensure their infrastructure keeps pace with external pressures.¹

As well as a compelling evidence base and alignment to Government policy and recommendations, the LWW approach is also well supported by customers and key stakeholders.

The Blue Green Plan has been developed with LWW partners and wider stakeholders. Over 70 members of the partner organisations attended two LWW Blue Green Plan charette's which enabled key stakeholders to understand the need and help shape the plan for the future. Three councillor engagement sessions have provided the opportunity for over 30 council members to input into the Blue Green Plan's creation. 48 young people attended a Hull Youth Parliament which collected views and feedback on Hull's Blue Green Plan for the future. Eight key local businesses attended a Business Breakfast event to understand the direction of the Blue Green Plan and how local business leaders can support this.

1.3.2 The Scale and Timing of the Investment

The investment for the period 2025 to 2030, has been developed using the Blue Green Plan – a long-term strategy developed and co-funded by the partnership (see High Level Driver Description for more detail).

Hull and the surrounding area are completely reliant upon the combined sewer network for drainage, which takes around 88% of all water that falls in the catchment, including several watercourses. This system is unique and requires an innovative and coordinated approach to manage the impact of climate change. The Blue Green Plan focuses on managing the impact of climate change in this part of our region, focussing on a 2080 scenario.

The impacts of climate change are stark and there needs to be long term sustained investment to provide the mitigation required. The Blue Green Plan identifies costs between £1bn and £1.6bn to create the resilience that the city requires by 2080. To achieve this, the Blue Green Plan focuses on creating several new networks across the catchment, to create new surface water systems which relieve capacity on the combined sewer network and reconnect water to the Humber. These new surface water systems will focus on blue-green engineering which accommodates the topography of the area and supports regeneration of this deprived region.

Whilst the need for action is pressing, we recognise that the Blue Green Plan is underpinned by people and culture and based upon our AMP7 experiences we know that retro-fitting of SuDS still feels very new, therefore we have focussed on creating a delivery plan for AMP8 which is at a pace that will allow significant engagement with local communities as well as engagement across multiple departments within the partner organisations. In future AMPs we anticipate rate of delivery will increase significantly to be able to meet the needs of the future climate, as nature-based solutions, including SuDS become more common place and the impacts of climate change become more frequent.

The £26.3m investment planned for AMP8 will create significant enabling infrastructure in the 'West Network'. This location has been selected by the partnership because it is one of the most vulnerable areas of the city. This enabling activity will include: the first phase of a large pumping station to create capacity within an existing water course; length of new blue-green corridors which act like a surface water network but divert water down long vegetated channels; a small pumping stations and installation of property and road based source control (assets such as water butts, raingardens, planters, swales and bio-retention areas). Further details of the assets are described in the section 'Options Considered'.

1. ¹ NIC 'Reducing the risk of surface water flooding' Nov 2022 <https://nic.org.uk/studies-reports/reducing-the-risks-of-surface-water-flooding/surface-water-flooding-final-report/>

1.3.3 Interactions with Base Expenditure

We confirm this enhancement case is in addition to any implicit allowance for sewer flooding activity allowed through the base econometric modelling.

1.3.4 Activities Funded in Previous Price Reviews

Yorkshire Water is currently investing £23m in LWW in AMP7, this is governed by a bespoke LWW Performance Commitment. The current investment must deliver flood resilience to a specified number of properties across three different return periods (including climate change).

The Blue Green Plan which has been developed to support our AMP8 (and future AMP) investment uses a baseline which is inclusive of AMP7 notional schemes which achieve the numbers defined by the performance commitment, therefore any future investment acknowledges and does not double count properties protected by this previous investment.

1.3.5 Long-term Delivery Strategy Alignment

The AMP8 investment for LWW has been defined by the Blue Green Plan, a long-term strategy developed and co-funded by the partnership.

As presented at COP26 by LWW, we must decide what we want the future to look like and make changes now to make it happen. Our vision is to live with and embrace water in a green and climate adaptive place. We can do this:

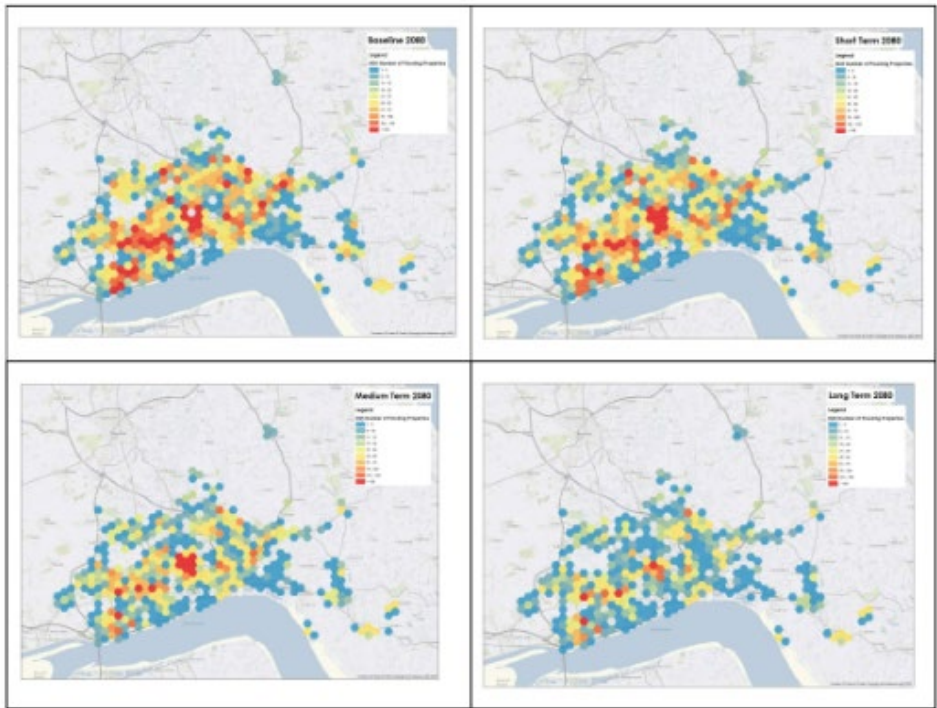
- Through effective place making in urban and rural locations. We will enable sustainable and healthy lifestyles and provide attractive places to live and work.
- By embedding managed change through our public and private partnerships that align our needs and delivery plans.
- Improving flood resilience by safely managing, storing, moving and reusing water to benefit our communities, the environment and society.

More detail on the vision and supporting pillars of the Blue Green Plan can be found in Annex 1.A at the bottom of this document.

The plan shows that it is possible to radically increase flood resilience whilst enhancing and improving spaces and places for our communities. The plan can help transform our urban areas to better utilise green spaces, store surface water locally, move surface water and reuse the surface water. The plan though recognises that water does not sit in isolation, but is an integral part of other services, sectors, growth and change within Hull and Haltemprice. It seeks to work with others to co-plan, co-create, co-fund and co-deliver schemes that create multiple benefits whilst reducing the cost to deliver. So how we manage and plan for change that happens around us is critical to implementing the plan. This plan helps us combat climate change whilst enhancing our city and the wellbeing of our communities.

A primary aim of the plan is to demonstrate the change in flood resilience. These images show the severity of the flood risk in the future, and when we implement the plan, how the flood risk can significantly reduce. Our plan considers some broad timescales. We look to the future to plan for predicted changes in rainfall, population growth and permeable surface being paved over. Our plan considers three stages of implementation over a 25-year period starting in 2025. The short-term period is 2025-2035, the medium-term is 2035-2045 and the long-term is 2045-2055.

Figure 1.1: Spatial Representation of the Model Flood Risk Showing Flood Risk Improvements Over Time as the Blue Green Plan is Implemented



The blue green plan will be geographically spread across Hull and Haltemprice and will facilitate the vision, “to live with and embrace water in a green and climate adaptive place”. This master plan shows locations of the blue green corridors to convey surface water through the city, areas that will be adapted to provide pathways into the blue green corridors, widespread source control, smart controls used to optimise the systems, and potential locations for managed change to further promote resilience.

Our long-term delivery strategy is structured around four primary enhancement investment areas, each of which is underpinned by one or more strategic planning areas. The table below demonstrates how each investment area will contribute to achieving our long-term outcomes for customers.

Table 1.4: LTDS Investment Areas

Investment area	Strategic planning area	Outcome					
		Secure, safe, clean water supplies	First-class customer service	Bills everyone can afford	Modern and resilient infrastructure	Net zero carbon emissions	A healthy, natural environment
Clean water	Water industry natural environment programme (clean) Water resources management plan Drinking water quality						
Wastewater	Water industry natural environment programme (waste) Drainage and wastewater management plan Bioresources						
Resilience	Clean water resilience Clean water security Wastewater resilience Wastewater security Living with Water						
Net zero	Carbon and energy						

 [Read more about the LTDS at Long Term Delivery Strategy](#)

1.3.6 Customer and Stakeholder Support

We know from our Drainage and Wastewater Management Plan ([DWMP customer research](#)) and [climate change customer research](#) that mitigating the effects of climate change must remain firmly on our agenda. Customers are aware that climate change will create more extreme rainfall and increase the likelihood of flooding that is more frequent and extreme if adaptation measures are not implemented, and this is especially the case in areas of our region which are more prone to flooding. Even in this economic climate, customers were not prepared to push forward the spend on this, 91% agreed climate change was a prominent issue.

To learn more about our customer and stakeholder engagement, see Chapter 6 of our main business plan.



More detail on this subject can be found in [Chapter 6: Customer and Stakeholder Engagement](#)

This was also said for population growth, where customers could see the extent and rate of housing development and loss of land as a result - and could therefore see the impact of this on flooding during heavy rainfall.

'A lot of drains are not built for the amount of houses going up. It's going to come to a head.' (DWMP Research, NHH, Water Dependent)

'There's more runoff with more houses because you are covering over the grass and then we flood more.' (DWMP Research, NHH, Water Dependent)

Research undertaken with key regional stakeholders in the summer of 2021 highlighted that reducing the impact of flooding was their number one priority, followed in second place by achieving net zero [Confidential Stakeholder Engagement Research, June 2021 – available on request], both of which contribute to this enhancement case. Given the position of Hull as a low-lying city, the plight of Hull is unfavourable unless significant measures are taken. Stakeholders within this research praised our approach to partnership working to tackle flooding in Hull and hoped to build similar partnerships in their own areas of the region.

"Individual authorities have been working with Yorkshire Water, but we need much more of a joined up regional approach. We're learning from Hull because they've been really good at that" Stakeholder Engagement Research, Summer 2021.

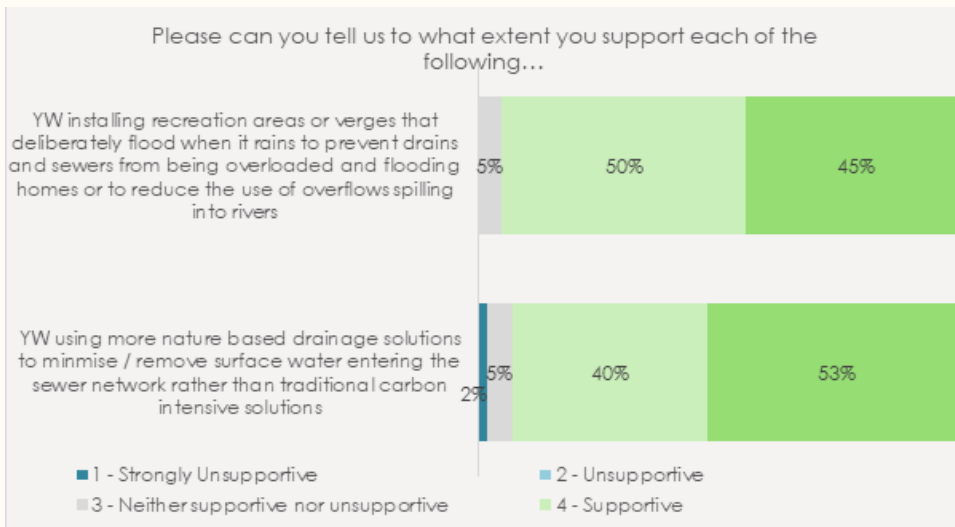
We asked customers in our [Exploring Views on Climate Change study](#) about the best approach to tackling climate change – mitigation or adaptation. Although it's felt to be a shared responsibility, customers felt that there is more room for individual customers to get involved with mitigation activities such as reducing emissions whilst companies, governments, groups etc are more prominent in both, but especially adaptation activities such as protecting against flooding.

When it comes to how best to reduce surface water flooding and the risk of, we know from several of our studies that customers are supportive of natural blue/green solutions to deliver this. In our [DWMP research](#), tackling failures and improving infrastructure were immediate priorities but in the mid-to long run, the focus should be on improvements and adapting to future challenges and this should be done in conjunction with partners to be more effective. Customers suggested the following priorities to deliver this:

- Improve the sewage network using a combination of Sustainable Urban Drainage Systems (SuDS) and tried and tested /carbon intensive methods i.e., building bigger tanks, and sewers.
- Work with developers to use new ways to deal with excess run off.
- Use Government legislation with developers so they use SuDS.
- Continuing to change customers' mindsets, both household and business, and behaviour towards taking personal responsibility for surface run off.
- Reduce the amount of river pollution incidents.

To confirm, the chart below highlights that the vast majority of customers in our DWMP research were in support of SuDS based initiatives which this is a key focus of delivery for this enhancement case in Hull.

Figure 1.2: DWMP Research Customer Support



Regarding partnership schemes, joint funding and future maintenance of schemes delivered in partnership – we know our customers believe that Yorkshire Water should be funded to work on partnership schemes and should also have ongoing funding to manage new assets beyond simply delivery – this was seen as one of the most tangible approaches to solving climate change challenges and the huge challenge of controlling surface water flooding – councils and developers should be party to these ongoing plans.

“There appears to be a case for a more defined approach to the regulation of the water industry, so that companies are able to prioritise investment and meet objectives.”
[Customer Research - Understanding Customer views on Positioning Papers: Strategic Priority Statement & Accountability](#)

In addition, in our [qualitative Affordability & Acceptability testing](#) we positioned the LWW investment as an ‘optional extra’ and asked customers if they would like to include the LWW initiative in their final plan (an early view of this scheme included £59million investment for a cost of £0.61pence per year). Almost half of customers supported including this initiative, given the other evidence collected regarding support for reducing the impact of flooding we felt confident to include this in our business plan. Since then, the scope of the programme has reduced. Included in our final proposed plan tested in [affordability and acceptability testing \(following Ofwat guidelines\)](#) was £26million at a cost of £0.30pence per year. Our plan was supported by customers including this enhancement, 78% found our plan acceptable.

Finally, our enhancement case for Living with Water is supported by the Yorkshire Leaders Board (you can read more about the Yorkshire Leaders Board in [Chapter 6 of our main plan](#)) in their [letter of support](#) of our plan.

Partnership working is crucial to reducing flood risk. We are pleased that Yorkshire Water has recognised this in its business plan following our expression of concern last year.

The Living with Water (LWW) partnership in Hull and the East Riding was formed in 2017 and includes Yorkshire Water, Hull City Council, East Riding of Yorkshire Council and the Environment Agency. The partnership has developed detailed plans to improve flood resilience in the region.

We support investment proposals of approximately £25 million within Yorkshire Water’s business plan which supports the ambitions of the LWW partnership, including

investment in the partnerships' blue-green plan. (Yorkshire Leaders Board, Letter of Support, 12th September 2023)

Our enhancement case for LWW is further supported by the Yorkshire Regional Flood and Coastal Committee (here is a link to the RFCC [Letters of support](#))

The YRFCC oversees investment in Flood and Coastal Risk management across Yorkshire region - a task that is highly dependent on collaboration between the Environment Agency, local authorities and other Risk Management Authorities. Yorkshire Water is a crucial partner and the Committee has both encouraged, and been impressed by, the Living with Water and, more recently, the Connected by Water partnerships in East and South Yorkshire respectively. These partnerships are widely recognised as national exemplars in tackling integrated flood risk. Their work is characterised by a layered and strategic approach - delivering new and innovative infrastructure alongside optimising existing assets. Extensive community engagement has been critical to the work - increasing awareness, enabling the co-creation of schemes with strong local buy-in, and promoting personal flood resilience.

It is pleasing that the AMP8 submission signals a commitment to building further on the work already being delivered through AMP7, whilst also providing a basis for rolling out a similar approach in West and North Yorkshire. The YRFCC strongly endorses such aspirations and representatives of Yorkshire Water are active, and welcome, attendees at YRFCC meetings and its component sub-committees.

A key aspect of the Committee's remit is to encourage all Risk Management Authorities to work in partnership, both to align objectives and to deliver more efficiently. One of the lessons learned through AMP7 delivery is the importance of the closest possible alignment - of policies, processes and schemes – when addressing all sources of flood risk in order to ensure that we make the most effective use of all available funding, not least investment in nature-based solutions that address flood risk, alongside (rather than separate from) water quality and biodiversity. (Yorkshire RFCC, Letter of Support, 21st September 2023)

1.3.7 Factors Outside of Management Control

Many local authorities in England have now declared a Climate Emergency, and as our understanding, knowledge and ability to model the impacts of climate change increases we must take action to mitigate the challenges that we face. The Blue Green Plan for Living with Water ensures a long term, sustained approach that seeks to manage the impact of climate change on surface water flooding. Building upon the partnerships work in the current period which has created awareness within the city and beyond of the risk of surface water flooding and the need to manage water differently in the future; our AMP8 investment ensures that we continue the momentum with communities and key stakeholders to continue to implement retro-fit SuDS at scale.

Our AMP8 investment has been carefully planned to ensure it is aligned to programmes which focus on education and engagement as well as policy and process changes within all organisations to better facilitate both partnership working and retro-fitting SuDS. It is essential that the coming period allows the partnerships activity to build on existing momentum to facilitate long term sustained investment, any delay in investment will only exacerbate the costs and consequences of climate change.

1.4 Best Option for Customers

1.4.1 Options Considered

The Blue Green Plan is a long term (25-50yr) plan to build flood resilience across Hull and Haltemprice, while enhancing the area using SuDS and other blue-green infrastructure. Overall, this plan involves requires approximately £1bn to £1.6bn of investment (lower and upper estimates), from which approximately £2.7bn of benefits will be realised, including a flood risk resilience improvement of 80% (based on 1 in 5yr internal property flooding in 2080).

The plan is divided into a several networks that provide slow-the-flow measures across the city, combined with new surface water drainage pathways that link to existing water courses such as the Holderness Drain and the Fleet Drain. In this way, surface water runoff will be gradually separated from the combined sewer network, reducing surcharge levels in the combined sewers over time, and reducing flood risk accordingly.

We have selected the drainage network in the west of Hull (known as the West Network) as the place to start our implementation of the Blue Green Plan. This is because there is some recently constructed drainage infrastructure in this area (e.g., WADFAS, AEEFAS) and the Blue Green Plan provides an opportunity to separate paved areas by connecting into this infrastructure, enhancing the overall drainage pathway conveying surface water from the north of the area into the Fleet Drain in the south. Completion of the West Network would improve overall flood resilience in the city by up to approximately 20%.

It is not possible to deliver the full West Network in AMP8 due to the scale and cost of the work that would be required. We also acknowledge that large-scale blue-green solutions are still relatively unknown within the city, and that it will take time for residents to acclimatise to the type of solutions being proposed, particularly blue-green corridors, which will reduce road space available while providing green channels for surface water conveyance, as well as facilitating active travel.

Consequently, we propose to deliver the West Network over a 15-year period as summarised in the table below:

Table 1.5: Proposed 15-Year Plan

Period	Flood Resilience Benefit (Cumulative)	Cost Total (£m)	Cost YW only (£m)	Focus / Rationale
AMP8	1-2%	40.5	26.3	Deliver essential enabling assets (surface water pumping stations). Deliver distributed roadside SuDS (e.g., raingardens) at scale to normalise these measures within the community and pave the way for further large-scale SuDS deployment in the future. Introduce the concept of blue-green corridors by installing small sections as part of the overall solution to demonstrate their efficacy.
AMP9	8-10%	130.0	73.5	Upscaled delivery of distributed roadside SuDS over a wider area of the West Network. Deliver blue-green corridors at larger scale as community acceptance of the strategy increases.
AMP10	20%	300.0	158.0	Maintain widespread delivery of distributed roadside SuDS across the remainder of the West Network. Delivery of the majority of the blue-green corridors in the network as strategy becomes normalised and road-usage habits change.

We identified four options for AMP8 delivery of surface water separation and conveyance in the West Network. All of these options require a new surface water pumping station at the outlet of the Fleet Drain into the Humber estuary. This will allow the Fleet Drain to discharge into the estuary irrespective of the tide level, thus increasing the availability and capacity of the Fleet Drain. Please note that the solutions developed are focussed on the holistic management of surface water within the catchment and span the responsibilities of all Living with Water Partners (please refer to section 1.4.6 which discusses the co-funding model for the investment).

Table 1.6 provides an overview of the options considered:

Table 1.6: Overview of Options

Option Name & Description	Key Elements
<p>Adaptive Green 20 Manages (separates) surface water runoff across 20km of residential road (approx. 27ha of paved area) using green roadside SuDSs to slow the flow, and blue-green corridors to collect and convey surface water into existing drainage infrastructure.</p>	<ul style="list-style-type: none"> • Fleet Drain Surface Water (tidal) Pumping Station • Blue-green corridors along Willerby Road, Anlaby Road, Anlaby Common and Anlaby Park Road • Deep pipe on Springhead Lane and surface water pumping station in Anlaby Common to facilitate the separation of surface water runoff north of Anlaby Road. • Approx. 20km of new surface water sewer, connected to approx. 430 roadside SuDS devices (e.g., raingardens) to collect runoff and direct it away from the combined sewer network. • Water butts (or similar downpipe attenuation measures) installed across approximately 3300 residential and non-residential properties in the area.
<p>Adaptive Green 7 Reduced scope version of Adaptive Green 20 which omits potentially complex and disruptive blue-green corridor installations along Willerby Road and Anlaby Road. Manages (separates) 7 km of residential road (approx. 10ha of paved area)</p>	<ul style="list-style-type: none"> • Fleet Drain Surface Water (tidal) Pumping Station • Blue-green corridors along Anlaby Common and Anlaby Park Road only • Deep pipe on Springhead Lane and surface water pumping station in Anlaby Common to facilitate the separation of surface water runoff north of Anlaby Road. • Approx. 7.5km of new surface water sewer, connected to approx. 160 roadside SuDS devices to collect runoff and direct it away from the combined sewer network. • Water butts (or similar downpipe attenuation measures) installed across approximately 3300 residential and non-residential properties in the area.
<p>Adaptive Grey 20 Manages (separates) surface water runoff across 20km of residential road (approx. 27ha of paved area) using geocellular storage to slow the flow, and large pipework to collect and convey surface water into existing drainage infrastructure.</p>	<ul style="list-style-type: none"> • Fleet Drain Surface Water (tidal) Pumping Station • Large pipes along Willerby Road, Anlaby Road, Anlaby Common and Anlaby Park Road to collect flow from separated areas. • Deep pipe on Springhead Lane and surface water pumping station in Anlaby Common to facilitate the separation of surface water runoff north of Anlaby Road. • Approx. 20km of new surface water sewer, connected to distributed geocellular storage modules to collect runoff and direct it away from the combined sewer network. • Water butts (or similar downpipe attenuation measures) installed across approximately 3300 residential and non-residential properties in the area.
<p>Adaptive Grey 7 Reduced scope version of Adaptive Grey 20 which omits potentially complex and disruptive pipe installations along Willerby Road and Anlaby Road. Manages (separates) 7 km of residential road (approx. 10ha of paved area)</p>	<ul style="list-style-type: none"> • Fleet Drain Surface Water (tidal) Pumping Station. • Large pipes along Anlaby Common and Anlaby Park Road only. • Deep pipe on Springhead Lane and surface water pumping station in Anlaby Common to facilitate the separation of surface water runoff north of Anlaby Road. • Approx. 7.5km of new surface water sewer, connected to distributed geocellular storage modules to collect runoff and direct it away from the combined sewer network. • Water butts (or similar downpipe attenuation measures) installed across approximately 3300 residential and non-residential properties in the area.

Each of the options identified are designed so that they can be deployed in a modular manner. As such, this is an adaptive approach that will allow us to respond to delivery opportunities such as collaboration with existing highway maintenance plans and community preferences.

The grey options have been developed such that certain elements (such as geocellular storage) can be used in place of the green options in locations where there is minimal grass verge available, and where loss of parking spaces cannot be accommodated by residents.

1.4.2 Cost-Benefit Appraisal

For each of the four shortlisted options assessed, we considered benefits using six capitals approach. The Ciria B£ST tool (a SuDS assessment tool supported by water companies, consultants and agencies throughout the UK) and Flooding Damages Avoided (using the Multi-Coloured Manual) to calculate the benefits in line with the EA’s Flood and Coastal Erosion Risk Management Appraisal Technical Guidance². Categories that where benefits were assessed included: air quality, amenity, biodiversity & ecology, carbon reduction & sequestration, education, flooding, health, traffic calming, and water quantity

The total calculated benefits are summarised in the table below, this value has been derived using the Ciria B£ST tool and the Multi-Colour Manual:

Table 1.7: Benefits

Option	Benefit
Adaptive Green 20	35.6
Adaptive Green 7	22.4
Adaptive Grey 20	26.9
Adaptive Grey 7	18.3

Although not included in the above table, an additional assessment has been undertaken to consider the wider economic benefits associated with the proposed work. This assessment calculated a total of approximately £30m and £60m of temporary construction benefit for the Green/Grey 7 and Green/Grey 20 options respectively. This includes for potential direct temporary construction jobs and the associated economic activity generated during the construction phase of the project.

The following key assumptions have been made for the benefits assessment:

- Benefits assessment period up to 2100 with benefits assumed to accrue from 2028 (operational costs were assessed over the same period)
- 3 trees assumed for every 10m of blue green corridor

A summary of costs for the four shortlisted options is shown in the table below (**please note that these are the total scheme costs, not YW only costs**):

Table 1.8: Option Summary

Option	Enabling Measures	Slow the flow measures	Total
Adaptive Green 20			
Capex (£m)	29.4	49.7	79
Opex (£m)	0.3	1.1	1.4
Total (£m)	29.7	50.8	80.4
Adaptive Green 7			

²

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1065570/fcerm-appraisal-technical-guidance.pdf
 YKY39_Living with Water Enhancement Case

Option	Enabling Measures	Slow the flow measures	Total
Capex (£m)	19.3	20.3	39.6
Opex (£m)	0.3	0.6	0.9
Total (£m)	19.6	20.9	40.5
Adaptive Grey 20			
Capex (£m)	24	50.8	74.8
Opex (£m)	0.3	0.8	1.06
Total (£m)	24.3	51.6	75.86
Adaptive Grey 7			
Capex (£m)	18.5	20.3	38.7
Opex (£m)	0.3	1.6	1.8
Total (£m)	18.8	21.9	40.5

The capex cost build-up for each of the four options considered is shown below (please note that these are the total scheme costs, not YW only costs)

Table 1.9: Proposed Capex for Each Option

Category	Adaptive Green 20 (£m)	Adaptive Green 7 (£m)	Adaptive Grey 20 (£m)	Adaptive Grey 7 (£m)
Slow the flow measures (roof) Water butts	0.72	0.72	0.72	0.72
Slow the flow measures (road) Local SW sewers, raingardens, geocellular storage	49.02	19.5	50.1	19.5
Surface water pipes/corridors as required on Springhead Ln, Anlaby Way, Willerby Rd	12.44	2.41	7.96	2.41
Surface water trunk sewers and connections In Anlaby Common and Anlaby Park Road (Grey options only)	0.00	0.00	3.73	3.73
Blue-Green corridors In Anlaby Common and Anlaby Park Road (Green options only)	4.57	4.57	0.00	0.00
Anlaby Common pumping station	1.71	1.71	1.71	1.71
Fleet Drain pumping station	10.6	10.6	10.6	10.6
Total Capex (£m)	79.06	39.51	74.8	38.67

The cost of slow the flow measures such as raingardens, water butts and geocellular devices is based on the cost estimates developed for these devices within the Blue Green Plan, but also informed by our AMP7 SuDS delivery experience. Further cost insight from the wider industry

experience was provided by Stantec and will increase in confidence as the industry in general develop our understanding of source control SuDS delivery.

Blue-Green corridor unit costs have been taken from the Blue Green Plan which used a bottom-up approach to estimate the cost of delivery. As mentioned previously, this is a comparatively new concept and there is little experience in the industry of delivering this sort of infrastructure within urban areas. It should be noted that blue-green corridors represent a relatively small proportion of the overall cost of the options presented (e.g., around 12% of the total cost of the Adaptive Green 7 option).

The other elements within each option were costed using our in-house cost models.

1.4.3 Carbon impact and best value

Carbon impact for each option considered was estimated using the EA's Carbon Modelling Tool. In cases where assets included in the shortlisted option were not included in the tool (e.g., raingardens and blue-green corridors), we carried out bottom-up estimates of the capital carbon impact. The results of the assessment are shown in the table below.

Table 1.10: Carbon Impact

Option	Whole Life Carbon Impact (tCO2e)
Adaptive Green 20	14,600
Adaptive Green 7	11,100
Adaptive Grey 20	33,700
Adaptive Grey 7	19,500

1.4.4 Impact Quantification

Due to the delivery profile of the AMP8 investment, there is no impact of this investment on performance commitments in AMP8. As previously stated, we expect to improve the flood resilience of the West Hull drainage network by up to 20% over the next 15 years. We calculated benefits over a long-term horizon to 2100 to reflect the time it takes to develop and establish our blue green plan.

The AMP8 investment largely focusses on managing the long-term impact of climate change, however as the region is already significantly vulnerable to flooding, there will be a benefit to performance commitments for Internal Sewer Flooding and External Sewer Flooding from AMP9 onwards.

1.4.5 Cost and Benefit Uncertainties

Throughout our AMP7 experience of retro-fitting SuDS within Hull and the surrounding area, a key concern has been the impact of existing services, which due to ground conditions are often not at the expected depth or anticipated location. The presence of services has required significant re-design. We have built this learning into our feasibility stage for the AMP8 delivery programme, to try and minimise the future impact but delivering in a densely populated environment means that this is an unavoidable risk. As a result, whilst we will seek to opt for green SuDS wherever feasible, we have alternative grey measures available to mitigate risks when appropriate.

The same approach will be used to mitigate challenges from local communities who are unable to tolerate loss of parking for example.

The LWW Blue Green Plan approach is modular and therefore all elements complement each other but can also be deployed in isolation. As such, we have proposed a PCD which ensures

delivery for customers but maintains flexibility to ensure best value decisions can be made as challenges to delivery arise.

1.4.6 Third Party Funding

In response to our query regarding partnership contributions Ofwat stated that: “Benchmarking will only take into account contributions made by third parties to enhancement schemes proposed by companies which are consistent with the proper carrying out of statutory functions. These third-party contributions would pay for costs that customers would otherwise have to pay for.”

For Living with Water, we anticipate a partnership contribution of ~£15m for the AMP8 phase of investment. It is anticipated that the main source of this funding will be the Environment Agency’s Flood Defence Grant in Aid, this funding is associated with managing flood risk beyond the responsibility of Yorkshire Water, therefore we have not accounted for this funding within our reporting.

This ratio of funding is consistent with our AMP7 approach. To ensure that the LWW schemes represent best value for each of the partner organisations we have used a number of tools to appropriately apportion cost and benefit:

- Utilisation of the Living with Water hydraulic model to identify the inputs into the combined sewer
- Categorisation and apportionment of inputs across the Risk Management Authorities (RMA) e.g., roof, road and land drainage
- Calculation of benefits to each partner using their own cost-benefit analysis tool (e.g., YW assesses the benefits to their customers only to ensure viability; the EA process assesses Outcome Measures associated with their FCERM approach)
- Calculation of available investment to each partner using their own cost-benefit analysis tool (e.g., the value partners invest into creating flood resilience varies per property due to differing drivers and governance)

Due to the differing nature of cost-benefit analysis and classification of benefits across the different partners, costs may not always be shared equally. This approach is scrutinised by the EA’s Flood and Coastal Erosion Risk Management (FCERM) Appraisal Process when schemes are submitted for match funding).

1.4.7 Customer Views

We have not carried out specific customer engagement in relation to solution options, however as part of our Living with water engagement strategy, schemes are co-created with the community area we are working in, and we intend to continue with this approach.

Our Living with Water partnership has been ongoing since 2017, and we have built up a wealth of support from our partnership group (East Riding of Yorkshire Council, Hull City Council, the Environment Agency, The University of Hull and Yorkshire Water.)

We have a comprehensive engagement strategy as part of our Living with Water programme which has been running throughout AMP7. Our engagement for any scheme within the Living with Water programme follows a four-stage approach:

1. **Raise awareness of SUDs and nature-based flood prevention solutions:** We are mindful that to understand customer views on blue-green flood alleviation schemes, we need to carry out educational awareness first and foremost.
2. **Targeted community engagement:** Alongside our partners, which includes East Riding of Yorkshire Council, Hull City Council, the Environment Agency, The University of Hull and Yorkshire Water, we co-create schemes by engaging with the community on what is most feasible and acceptable in an area.
3. **Delivery:** After the co-creation activity, we deliver the scheme alongside our partners.
4. **Ongoing engagement:** To ensure a positive future legacy of any scheme, we continue with ongoing engagement with partners, offering value-add services (i.e., water butts and other water efficiency offerings) where possible.

Examples of our engagement work can be found on the Living with Water website; this includes a short video which explains the concept of SuDS; a game which gives insight into customer opinions of SuDS type and placement within communities; educational resources and much more.



See the video at <https://livingwithwater.co.uk/projects/sustainable-drainage-systems-suds>



Play the game at <https://livingwithwater.co.uk/news/hulls-flood-resilient-future-brought-to-life-with-living-with-water-game>

To put into context the level of community engagement we carry out as part of our Living with Water programme, our recent engagement at Rosmead Street consulted with over 420 people, across a total of 356 engagement hours. This included activities such as attending councillor meetings, school events, CEO site visits, resident drop ins and many more.

Image 1.1: Engagement activity event for Rosmead Street



We will continue to take a comprehensive approach to customer engagement throughout AMP8, ensuring that as solutions are developed into a detailed design, customer views are incorporated to ensure the long-term sustainability of assets which will be based within communities.

1.4.8 Direct Procurement for Customers (DPC)

For more information on the process followed and the cases that were ultimately judged as suitable for DPC please see [section 6.3](#) in Introduction to Enhancement Cases. duction to Enhancement Cases.



Read more about this at [Introduction to Enhancement Cases](#)

1.5 Cost Efficiency

This section outlines how our overall approach to cost estimation and cost efficiency, as outlined in [section 7.3](#) in Introduction to Enhancement Cases, has been applied to this enhancement case. Table 1.1 at the beginning of this document summarises the costs associated with this enhancement case:

1.5.1 Cost estimate for our preferred option

We are proposing £26.25m (2022/23 price base) of enhancement expenditure in AMP8 to deliver schemes as part of the Living with Water Partnership. As outlined in our best option section, we are proposing a mixture of blue green and grey schemes for delivery in AMP8. The table below summarises the schemes and the total cost for each scheme and the solution type:

Table 1.11: Cost of Solutions

Solution Type	Scheme Name	Cost Total	Cost YW
Water butts, raingardens, road-side SuDS	Slow the Flow	20.22	13.43
Blue Green Corridors	Blue Green Corridors	4.57	2.97
Pumping Station	Small Pumping Station	1.71	1.71
Pumping Station	Large Pumping Station Phase 1	10.6	6.89
Opex measures	Opex measures	1.8	1.25

We have used different costing approach depending on the solution type. We describe the approach for each solution below.

Grey solution

To cost the grey solutions, we have used the following approaches:

- We used a SuDS tool developed by a consultancy partner to estimate the costs for geocellular storage and cross checked this with our cost estimates.
- An estimate was used, based on agreed AMP7 LWW projects, for water butts in domestic properties across the catchment area.
- Costs provided by the Environment Agency for a similarly sized and situated pumping station, currently in delivery have been used to cost the large pumping station.
- Where no suitable cost models were identified in our Unit Cost Database (UCD), we utilised information held in the national water industry costing database where applicable (TR61 v14). Adjustments are required to this data to account for differences in methodology and to account for Yorkshire Water design costs. We used this approach for the 20km of surface water sewers.
- For the rest of the scope, sewerage cost models from the UCD were deployed (sewers, chambers, smaller submersible pumping station, kiosk, power upgrade, emergency generator, telemetry outstation).

Blue Green option

To cost the green solutions, we have used the following approaches:

- For the roadside rain gardens, we used costs from Stantec and Aqua Consultants for the scope of work on the verge and in the road. The costs were crosschecked against our internal estimates for consistency.
- For the Blue Green corridors, we used estimates provided by Aqua Consultants, the unit rates were benchmarked by Stantec.
- A combination of models from our UCD was used to cost the large tidal pumping station in the absence of a single model to cover the scope of a civil structure in the estuary.

- Where no suitable cost models were identified in our Unit Cost Database, we utilised information held in the national water industry costing database where applicable (TR61 v14). Adjustments are required to this data to account for differences in methodology and to account for Yorkshire Water design costs. We used this approach for the 20km of surface water sewers.
- For the rest of the scope, sewerage cost models from the UCD were deployed (sewers, chambers, smaller submersible pumping station, kiosk, power upgrade, emergency generator, telemetry outstation).

1.5.2 Efficiency of our cost estimate

[Section 7.3](#) in Introduction to Enhancement Cases outlines our approach to cost efficiency in enhancement cases, and how our internal process and delivery decisions are designed with efficiency in mind. This section outlines the application of this approach to this specific enhancement case.

We have used the best available data to benchmark our SuDS costs against the industry to ensure we are delivering an efficient unit costs per hectare, utilising our consultants to do this who work across the water sector. Please note that delivery of large-scale retro-fit SuDS schemes are still new to the industry, as such YW are supporting and contributing to the 'UKWIR -Understanding the long-term costs and wider benefits of surface water removal using Sustainable Drainage Systems (SuDS) to tackle sewer flooding and storm overflow operation' project. The research recognises:

'understanding what the costs (capital and operational) and carbon are to implement such approaches to create the wider and hydraulic benefits in the sewer network have been debated for the retrofit situation. Furthermore, the delivery timescales tend to be longer than traditional solutions due to the necessary interaction of retrofit solutions with the public realm, collaboration with partners and stakeholders (including co-funding) and the need for community involvement and engagement.'

1.5.3 Need for enhancement model adjustment

Without a view of the Ofwat approach to setting cost allowances to each driver, anticipating any model adjustment requirements is challenging.

Due to the nature of this enhancement expenditure being a YW specific resilience case, it is unlikely that a comparable industry-wide data set will be available. We therefore anticipate that Ofwat would assess these costs through a deep dive approach.

1.6 External assurance

For information on Assurance please see [section 7.4](#) in Introduction to Enhancement Cases.

1.7 Customer Protection

For information on the methodology we have used and the central assumptions we have applied for our Price Control Deliverables (PCDs) please see [section 8.2](#) in Introduction to Enhancement Cases.

Whilst our expenditure on Living with Water initiatives is below the 1% materiality threshold for PCDWW35, we propose to implement a Price Control Deliverable due to the low oversight of project delivery from other regulatory bodies. This Price Control Deliverable will safeguard customers against under-delivery of our flood risk mitigation programmes.

We also considered whether additional customer protection mechanisms were in existence or should be introduced to complement the PCD.

1.7.1 Price Control Deliverable

We set out our PCD parameters and payment rates in the following tables.

Table 1.12: PCD Parameters

PCD Delivery Expectation	
Description	<p>The Living with Water partnership is a collaboration between Yorkshire Water, Hull City Council, East Riding of Yorkshire Council and the Environment Agency to manage flood risk in the area. Hull University is the academic partner of Living with Water.</p> <p>The network in Hull and the surrounding East Riding is very complex, with the combined sewer network managing 88% of all surface water within the catchment. Due to the geography and topography of the area, the catchment is entirely reliant upon pumping (using Yorkshire Water infrastructure).</p> <p>Working collaboratively, the company will support the partnership to continue to improve flood resilience (focusing on a climate horizon of 2080) in Hull and the surrounding area by 2% through the installation of blue-green and grey infrastructure in AMP8.</p> <p>During this period the partnership will collaborate to install key enabling infrastructure for a new surface water network which will reduce reliance upon the combined network for city drainage, this will allow for further infrastructure to be installed in future AMPs significantly increasing the resilience of the catchment. The partnership will also continue to carry out detailed customer engagement to increase understanding and support for nature-based solutions in a very urban environment and build this learning into our business as usual and sharing our progress with the industry.</p> <p>This work will be carried out alongside wider Living with Water programmes which focus on education, engagement and knowledge sharing.</p>
Output measurement and reporting	<p>The percentage of spend incurred on the Living with Water programme, reported to two decimal places. The company will report in parallel with the APR.</p> <p>The company will measure and report spend incurred on qualifying activities under the Living with Water programme. Qualifying activities are set out in the Living with Water document 'Blue Green Plan Technical Appendix: Outline Design Aspects'.</p>
Assurance	<p>The company must commission an independent, third-party assurer, with a duty of care to Ofwat, to assure, to our satisfaction, that the conditions below have been met and the outputs of the scheme set out below have been delivered. As part of the assurance, the company will provide its submissions to and decisions from the EA's Flooding and Coastal Risk Management Grant-in-Aid programme.</p>
Conditions on Scheme	<p>The drainage network in the west of Hull (known as the West Network) is the planned initial implementation of the Blue Green Plan. This location has been agreed by the partners due to the level of flood risk in this location and because there is some recently constructed drainage infrastructure in this area (e.g., WADFAS, AEEFAS) and the Blue Green Plan provides an opportunity to separate paved areas by connecting into this infrastructure. However, if there is partnership interest in an alternative drainage network, the company will substitute the drainage network where it can maximise the flood resilience achieved for Hull.</p> <p>All of our investment is subject to being able to secure matched funding from partners and other stakeholders. The LWW solutions are holistic and address sewer and surface water flooding at the same time, this ensures that the solutions minimise disruption during construction, are more sustainable, deliver wider benefits but most essentially are financially viable as tackling multi-source flood resilience is more efficient and gives access to multiple sources of funding. If no match funding is available the costs associated with managing sewer flooding only would increase disproportionately, becoming unaffordable for YW to deliver in isolation.</p>

Consistent with the RAPID gated process for developing new water resource option, we have proposed a percentage of spend PCD to reflect the design and early development process. Most of the investment and benefit of the West Network development will occur from AMP9 once we complete enabling works.

We considered whether we could define a more tangible output for the PCD. Partnerships and collaboration can take multiple years to establish and agree solutions, which may vary from those identified for PR24. Accordingly, we are unable to specify the exact solutions we will implement.

We have instead aimed for simplicity and an appropriate regulatory burden for the materiality of this enhancement funding. Alongside this, we consider we have a robust base for measurement, tracking and assurance against the Living with Water Objectives. We will be able to:

1. Define the qualifying activities upfront as per our Living with Water technical appendix.
2. Provide evidence of submissions³ and feedback from the FCERM GiA programme where applicable, which is central government funding administered by the EA for projects to manage flood risk.
3. Provide invoices of works performed across qualifying activities.

We propose a delivery profile that allows time for partnerships to be established and designs to be agreed, before we work to deliver enabling works by the end of AMP8.

Table 1.13: Forecast Deliverables

Deliverable	Unit	Forecast Deliverables (cumulative)				
		2025/26	2026/27	2027/28	2028/29	2029/30
Cost incurred on Living with Water	% (cumul)	5	15	30	80	100

We propose to return all unspent funds to customers. The PCD payment will be calculated at the end of AMP8 based on the actual cost incurred on relevant activities at the end of March 2030.

Table 1.14: PCD Payment Rate

Deliverable	Unit payment (£m)
% of spend	Calculated based on totex allowance at PR24 and the totex incurred to 31 March 2030. The PCD payment only applies to Yorkshire Water’s allowed funding, the totex of £26.25m.

1.7.2 Associated Performance Commitments

There is no performance commitment and associated ODI impact for this enhancement totex.

1.7.3 Annualised time delivery incentive

We do not propose a time incentive because this case does not meet the 1% materiality threshold to establish a PCD.

³ <https://www.gov.uk/government/publications/capital-grants-for-local-authorities-and-internal-drainage-boards>

1.7.4 Third Party Funding or Delivery Arrangements

We have only specified the customer protection for the elements that will be delivered by Yorkshire Water and funded by customers. As stated earlier in the enhancement case, the expected partnership funding will improve resilience for customers and community, but the partners will incur their costs on activities outside of our statutory responsibility.

Annex

Annex 1.A: Blue Green Plan