

Catchment Strategic Plan

Part of our Drainage and Wastewater Management Plan (DWMP)



Co-creating
resilient wastewater
catchments

A long-term Strategic
Plan for the **Beckton** System

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Foreword



Thames Water has been making considerable progress to bring to fruition their drainage and wastewater management plan (DWMP). The DWMP vision is to co-create a 25-year plan

for drainage and wastewater that benefits communities and the natural environment in London and the Thames Valley. We can all agree that planning to adapt to the growing critical pressures facing the water industry, such as climate change, a growing population and urbanisation, is of paramount importance and it has been very good to see that these challenges have been faced head on in the development of this plan.

Thames Water’s commitment to achieve the DWMP vision through a collaborative process is one of the most important and admirable themes of this plan. Working alongside stakeholders and customers, including the Thames Regional Flood and Coastal Committee, ensures that the plan is reflective of our combined views and optimises overall efficacy and acceptability.

I have thoroughly enjoyed being part of this process and have been impressed by the extent of engagement that Thames Water has managed to undertake despite the challenging conditions of the coronavirus pandemic. As a result, I believe that the DWMP offers a significant step forward in planning for drainage and wastewater in our region.

Of course, the real changes will only happen once the plan is implemented on the ground, but the joined-up work and co-creation of the DWMP plan so far promises significant improvements for customers, communities and the natural environment across London and the Thames Valley. Continued focus on maintaining a tight relationship with all stakeholders is essential in moving forward to ensure Thames Water reaches their ambitious goals.

Professor Robert Van de Noort
Chair, Thames Regional Flood and Coastal Committee

Preface

Our DWMP progress and enhancements since our draft plan

We're proud of our first DWMP, and encouraged by the level of positive feedback we've received. By engaging and working collaboratively with around 2,000 of our customers and stakeholders, we've been able to deepen our shared understanding as well as develop new ways to approach drainage and wastewater management across our region.

We'd like to say a big thank you to everyone who got involved and collaborated with us in the development of our shared plan. We're really happy it's having a positive impact already, and encouraged by the shared benefits we can deliver in the future as we continue to move forward together.

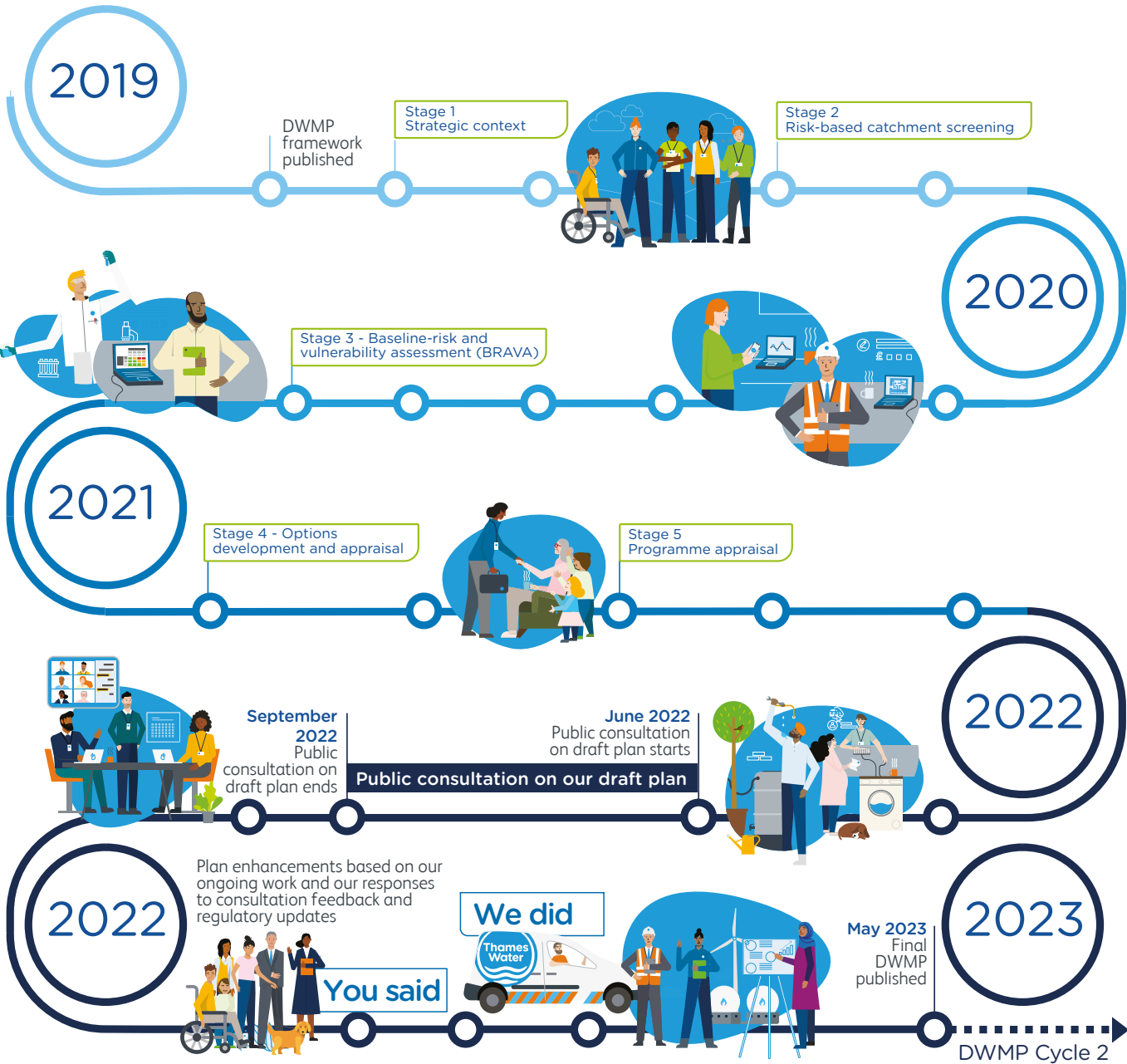
Our plan aligns with wider industry strategic plans and delivery programmes, such as the Water Industry National Environment Programme (WINEP) and the Long-Term Delivery Strategy (LTDS), and we'll make sure it continues to do so as we tackle current pressures and future challenges.

Over the past four years, we've developed, tested and enhanced our DWMP by engaging with customers and stakeholders and working with their valuable input and feedback to create a final plan we can all support. It's been almost a year since we first published our draft DWMP, and we've made some great progress since then. As customer and stakeholder requirements have evolved over time, our plan has evolved too.

We've enhanced our adaptive planning to increase the resilience of our final DWMP. We've also been testing its sensitivity against a range of alternative plans, risks and uncertainties to make sure our final plan is flexible to different potential futures. This approach will help us to make more proactive, adaptable and informed choices over time. It will also make sure that our interventions are set up for the future and can add the best value while providing ongoing opportunities for us to develop innovative solutions and ways of working.

The rest of this document summarises our final plan for this specific Catchment Strategic Plan (CSP) area, including the progress we've made from draft to final. We look forward to building on this progress and our collaborative approach as we implement our shared plan and evolve into DWMP Cycle 2.

DWMP Cycle 1



Preface

What you told us about the draft DWMP for our region

We published our draft DWMP for public consultation in June 2022, and asked our customers and stakeholders for their feedback on it. We received around 1,400 responses from a wide range of local, regional and national stakeholder groups, including responses from every CSP area across our region.

We received lots of positive comments on the quality and ambition of our draft plan as well as useful ideas for making our final DWMP even stronger.

The consultation feedback had six main themes, as outlined below. We’ve listened carefully and responded wherever possible within our final plan*.

This valuable feedback has further enhanced our DWMP and will help our customers, communities and the natural environment in our region to thrive now and in the future.

You said



You supported

- Our preferred plan with the majority of our customers and stakeholders agreeing with this choice
- Our proposed solution types from nature-based solutions to using the latest technologies to increase capacity in our sewer system
- Our partnership-working approach with our 200+ local authorities, organisations, action groups, catchment partnerships and national stakeholders

You challenged

- Our targets – you wanted amendments or some new ones to be added
- Our programme – you wanted quicker delivery in certain areas and were concerned about such an ambitious SuDS plan
- The cost – you were worried about the impact on customer bills

You offered ideas for

- New or amended solutions that we could consider including in our preferred plan
- Maximising the benefits of our preferred plan’s positive outcomes
- Enhancements to our stakeholder engagement approach and ongoing activities

You wanted more details on

- The resilience of our assets to flooding and power outage
- How our plan will be funded - by business-as-usual activities (base funding) or enhancement funds
- Adaptive planning scenarios to evidence how our plan could adapt to future influencing factors such as climate change

Feedback themes

**Protecting the environment**
Level of ambition and pace of delivery

**Evidencing best value**
Affordability and bill impact

**Delivering the plan**
Solutions and deliverability of the plan

**Enhancing the plan**
Technical clarifications and ease of navigation

**Working together**
Collaboration to achieve multiple benefits

**Valuing your input**
Stakeholder engagement

We did

We’ve used as much of your feedback as we could, together with the progress from our ongoing DWMP work and our responses to regulatory updates, to enhance our final plan including in the following ways:

**More** ambitious storm overflow target delivery to help protect the environment

**Increased** evidencing around best value and justification for our preferred plan

**Increased** alignment of DWMP to other strategies and delivery plans

**Increased** number of proposed solutions

**Rewritten** and restructured parts of the documents to be clearer and more accessible

**More** detailed content throughout, especially on strengthening partnership working and stakeholder engagement

**Additional** future scenario testing

**Increased** balancing of risk, ambition and deliverability

**Earlier** planned implementations

**New** dedicated technical appendices

* Some consultation feedback didn’t require further action or wasn’t relevant to the DWMP process. Other feedback was relevant to future DWMP planning cycles and will be used to inform this work.



This document focuses on the progress and updates we’ve made in our final DWMP for this specific CSP area.



Find out more about how we’ve addressed the wider consultation feedback in our [You said, We did](#) Technical appendix.

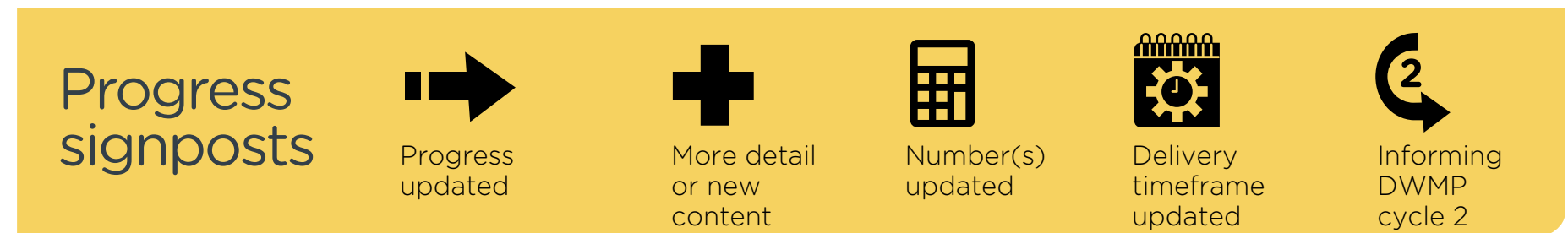
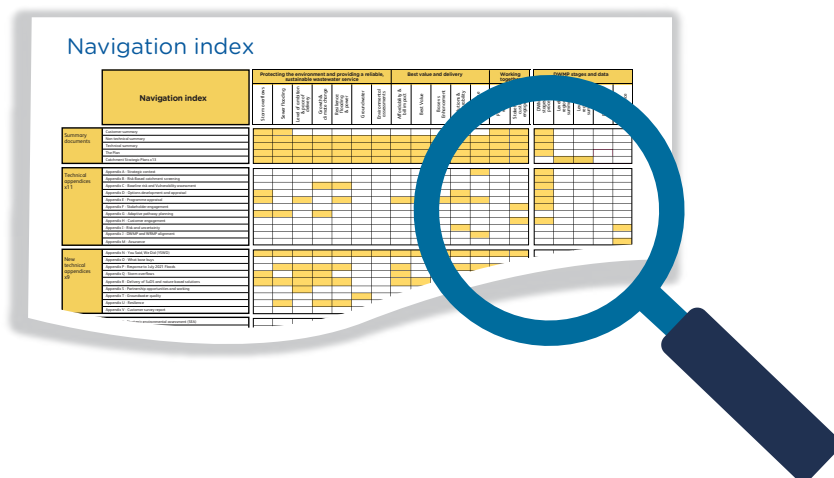
Preface

Navigating the final DWMP for our region

We've enhanced our final DWMP since we published it as a draft for public consultation in June 2022, and we want to make it easy for you to see what's changed.

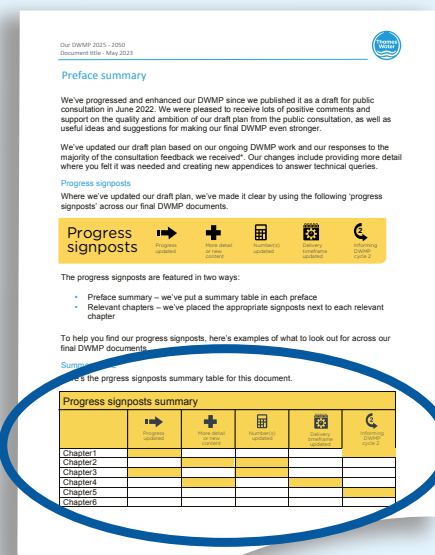
You can spot all the places we've updated our draft plan with our 'progress signposts', which we've used across all our final DWMP documents. Here's where they'll be:

- Preface summaries - We've put a summary table in each document's preface, excluding Summary documents and the Catchment Strategic Plans (CSPs)
- Relevant chapters - We've placed the appropriate signposts next to each relevant chapter, including Summary documents and the CSPs



To help you find our progress signposts, across our final DWMP documents, here are examples of what to look out for:

Preface summaries



Relevant chapters



If you need help navigating our final DWMP and locating key content, you can find a Navigation index at the back of this document.

Catchment strategic plan glossary

Term	Definition
1 in 30-year storm	A storm that has a 1 in 30 chance (3.33 % probability) of being equalled or exceeded in any given year. This does not mean that a 30-year flood will happen regularly every 30 years, or only once in 30 years.
1 in 50-year storm	A storm that has a 1 in 50 chance (2 % probability) of being equalled or exceeded in any given year. This does not mean that a 50-year flood will happen regularly every 50 years, or only once in 50 years.
Baseline Risk And Vulnerability Assessment (BRAVA)	Following Risk Based Catchment Screening (RBCS) detailed risk assessments on those catchments where we believed there was an adverse risk to performance over time, we modelled their performance for future epochs (2020, 2035 and 2050).
Combined Sewer	A combined sewer is a sewer designed to carry both wastewater and surface water from domestic and/or industrial sources to a treatment works in a single pipe.
Dry Weather Flow (DWF)	Dry Weather Flow (DWF) is the average daily flow to a Sewage Treatment Works (STW) during a period without rain.
EA Pollution Categories 1 to 3	Category 1 incidents have a serious, extensive or persistent impact on the environment, people or property. Category 2 incidents have a lesser, yet significant, impact. Category 3 incidents have a minor or minimal impact on the environment, people or property with only a limited or localised effect on water quality. Further guidance available here .
Event Duration Monitoring (EDM)	Event Duration Monitoring measures the frequency and duration of storm discharges to the environment from storm overflows.
Foul Sewer	A foul sewer is designed to carry domestic or commercial wastewater to a sewage works for treatment. Typically, it takes from sources including toilets, baths, showers, kitchen sinks, washing machines and dishwashers from residential and commercial premises.
Hydraulic Overload	When a sewer or system is unable to cope with a high flow.
L2 Area (Strategic Planning Area)	An aggregation of level 3 catchments (tactical planning units) into larger level 2 strategic planning areas. The level 2 strategic planning areas allow us to describe strategic drivers for change (relevant at the level 2 strategic planning area scale) as well as facilitating a more strategic level of planning above the detailed catchment assessments.

Term	Definition
L3 Catchment (Tactical Planning Unit)	Geographical area in which a wastewater network drains to a single sewage treatment works. Stakeholders may be specifically associated with this area. Includes for surface water sewerage that may exist which serves the wastewater geographical area but drains to a watercourse.
Lead Local Flood Authorities (LLFAs)	LLFAs are Risk Management Authorities as defined by the Flood and Water Management Act. They have statutory duties with respect to flood risk management, investigating flooding and the compilation of surface water management plans.
Risk Based Catchment Screening (RBCS)	A first pass screening exercise of catchment vulnerability against 17 different risk indicators to understand which catchments are low risk catchments and those that are likely to be at risk in the future if not supported by our long-term plan.
Sewage Treatment Works (STW)	A Sewage Treatment Works is a site where wastewater is received and treated to a standard legally agreed with the Environment Agency before it is released back into the environment.
Storm Overflow Discharges	Storm overflows are used to manage excess flows, which typically occur as a result of heavy rainfall. Excess flow that may otherwise have caused flooding is released through a designated outfall to a waterbody, land area or alternative drainage system.
Surface Water Sewer	A surface water sewer collects rainwater from domestic and commercial roofs, driveways, patios, etc to a local watercourse or suitable surface water drainage system.
Sustainable Drainage Systems (SuDS)	Drainage solutions for surface runoff that mimic natural drainage regimes and provide an alternative to a network of pipes and sewers.
Thames Regional Flood and Coastal Committee (TRFCC) Area	Thames Regional Flood and Coastal Committee (TRFCC) area was established by the Environment Agency under the Flood and Water Management Act 2010 that brings together members representing the Constituent Authority. Featured TRFCCs are listed here on our DWMP portal.

Introduction

Since 2019, we’ve been working with you, our stakeholders, to develop our first long-term strategy for wastewater and drainage issues within the Beckton system. This system covers the London boroughs of Kensington and Chelsea, Camden, Westminster, Islington, Hackney, Hammersmith and Fulham, Waltham Forest, Haringey, Tower Hamlets, Newham, Redbridge, Barking and Dagenham and the City of London.

We’re developing a strategy for the next 25 years to meet future challenges such as climate change, population growth and

urban creep which could impact the sewerage and drainage systems in our region.

We want to make sure we increase the resilience of our sewerage and drainage assets and network so that we can protect our customers, communities, and the environment from the impacts of these challenges. This long-term strategic plan outlines our shared vision for the future and details how, through working together, we can improve and enhance our wastewater and surface water services in this TRFCC area to achieve the following ambitious goals:

- In this document we’ll explain:
- How we’ve worked in partnership to develop our strategic plan
 - Our predictions of the future challenges we face in this region
 - How this plan is expected to address these challenges and who else needs to be involved
 - Our shared strategy for maintaining the safe and reliable delivery of wastewater and surface water services in the long-term

In this document we summarise our long-term plan for this catchment and also provide links to allow readers to investigate further into various risk zones. If you want to contact us or want to find out more about our DWMP and the set of documents it comprises, please use the following links:

DWMP@thameswater.co.uk

[Drainage and wastewater management plan](#)

Our Goals

95% of properties not at risk of flooding in a 1 in 50-year storm by 2050

Eliminate harm from storm overflows - no more than an average of 10 discharges per annum by 2045 at overflow locations

Enhancing resilience at Beckton sewage treatment works to ensure 100% permit compliance and protect river water quality

Our DWMP components

DWMP Framework

Strategic Context

Our DWMP




Technical Summary

The Plan

Technical Appendices

DWMP portal

Non-Technical Summary

Theme		How we will measure performance			
	Environment	Sewage treatment works quality compliance The ability of Sewage Treatment Works (STW) to treat and release treated sewage in line with the consented discharge permit quality conditions.	Sewage treatment works DWF compliance The ability of STWs to treat and discharge treated sewage in compliance with the flow discharge permit Dry Weather Flow (DWF) conditions.	Risk of pollution incidents The risk of polluting the environment through uncontrolled escape of sewage (classed as Category 1 to 3 by the Environment Agency) arising from either network or treatment sites.	Storm overflow performance The number of storm overflow discharges to the environment, both in the network and at the STWs.
	Property hydraulic sewer flooding	Internal hydraulic sewer flooding risk in a 1 in 30-year storm The risk of properties flooding internally as a result of hydraulic sewer overload.	External hydraulic sewer flooding risk in a 1 in 30-year storm The risk of sewer flooding to gardens and other land within the property curtilage as a result of hydraulic sewer overload.	Risk of hydraulic sewer flooding in a 1 in 50-year storm (resilience sewer flooding) The risk of residential properties experiencing sewer flooding as a result of hydraulic sewer overload based on a modelled assessment of the performance of our sewers in a storm that statistically occurs once every 50 years on average.	
	Asset health	Sewer collapses The risk of sewers collapsing or rising mains bursting that leads to a loss of / interruption to continued service.			

The Beckton system

Beckton sewage system serves a population of approximately 3 million in North and East London over a catchment area of 300 km², with over 18,000 km of sewer network and 224 pumping stations draining to the UK’s largest STW. This is a highly complex system with a wide variety of asset types. Parts of the system were built in the 1850s, so the system incorporates technologies originating from that period to the present. These include sewers made from brick, cast iron, glass reinforced plastic, concrete, pitch fibre pipe, clay and plastic.

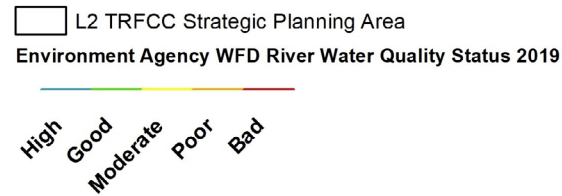
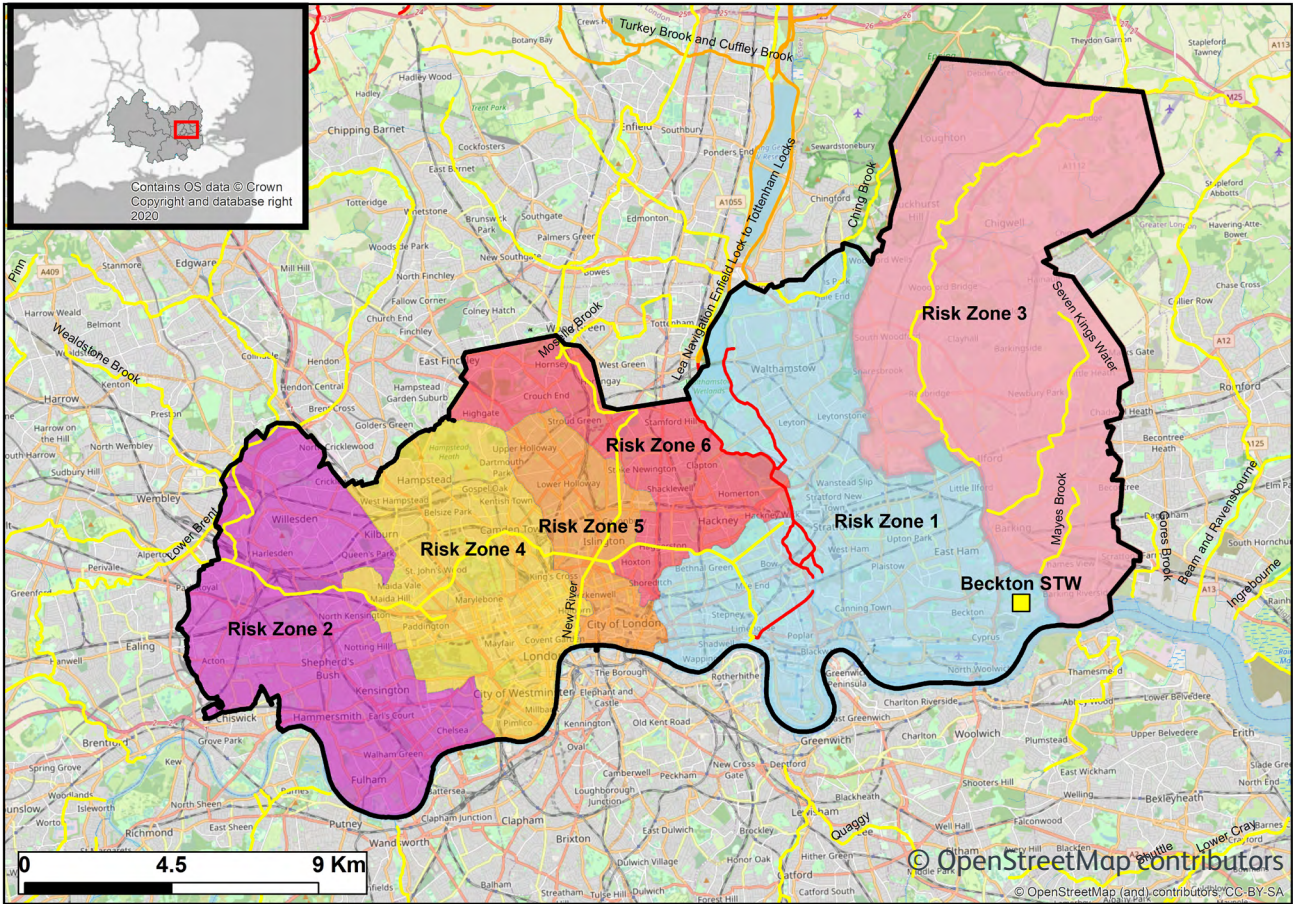
The catchment area extends from Hammersmith and Fulham in the west to Barking and Loughton in the east. South of the catchment area is defined by the River Thames and the northern border of the catchment passes through Cricklewood, Hampstead Heath, and Haringey.

The treated effluent from the sewage treatment works flows into the River Thames at Barking Creek.

Currently several combined storm sewer overflows discharge to the River Thames upstream of the STW. Soon, over 95 % of this storm sewer flow will be diverted to the Thames Tideway Tunnel which will convey it to Beckton STW for treatment.

The region overview map below highlights the watercourses and canals in this area. They are typically heavily modified and have water quality status ranging from bad to moderate.

The map also shows the sub-division of the Beckton system into 6 risk zones based on modelled catchments. The risk zones allow the DWMP process to be applied and better tailored to the smaller areas.



Our co-creators

Who our stakeholders are

It's not possible for all the benefits identified in the DWMPs to be developed by water companies alone. They are led by water companies but created collaboratively with other organisations and groups that, with Thames Water have a shared responsibility and/or interest in drainage, flooding and environmental protection. Active engagement with these stakeholders is vital for the consultation, planning and refinement of our DWMP.

Since 2019, we've been working with a wide variety of stakeholders from across this region to understand the local issues and opportunities so that we could create a long-term plan that provides the best outcome for everyone. In this region we've engaged and worked with stakeholders from the following organisations and groups:

London Borough of Barking and Dagenham, Brent Council, Camden Council, City of London Corporation, Consumer Council for Water, Department for Environment, Food and Rural Affairs (Defra), Ealing Council, Environment Agency, Greater London Authority, Transport for London, Essex County Council, Hackney Council, London Borough of Hammersmith and Fulham, Haringey Council, National Highways, Islington Council, Royal Borough of Kensington and Chelsea, Natural England, Newham Council, London Borough of Redbridge, Thames Regional Flood and Coastal Committee (TRFCC), Thames Flood Advisors, Thames Rivers Trust, Thames Water Customer Challenge Group (CCG), Thames21, Tower Hamlets Council, Waltham Forest Council and the City of Westminster.



The stakeholder feedback we've received

To ensure our stakeholders' views have been considered and are a fundamental part of our final DWMP, we've carried out a variety of stakeholder engagement activities.

From 2020 to 2022 much of the interaction was online due to coronavirus restrictions, but over the years they've included workshops, drop-in sessions, 1-2-1 calls, recorded webinar updates, newsletters, surveys, feedback forms as well as online discussions. From our engagement throughout each of the DWMP framework stages we know that our stakeholders want our strategic plan to deliver the following things in this region (see quotes on the right).

We've spoken to our stakeholders to identify their strategic management plans and policies that could interact with our DWMP. The strategic themes are displayed below and the following table records all of the plans and policies and how they align with the DWMP.

“

Include wider water management. Better understanding of our assets and how we can work together for drought and flood management.

”

“

Would appreciate recognition of cumulative cost of SuDS maintenance for councils & private land/property owners - currently only capital grants available, not revenue.

”



Partners' policies

Management Plan (Hyperlink)	Key aspects that align with the DWMP
Local Flood Risk Management Strategies	
Essex County Council, Local Flood Risk Management Strategy	<ul style="list-style-type: none"> “The ambition of the strategy is to ensure that Essex is a great place to live and work. We want to enhance the environment here, and create a place that is safe and sustainable. In terms of flooding, this means that you are informed about your flood risk, and understand why flooding is a problem for us all, and what is being done to manage it.”
London Borough of Barking and Dagenham, Local Flood Risk Management Strategy	<ul style="list-style-type: none"> Long-term vision to reduce the likelihood and detrimental consequences of flooding
London Borough of Waltham Forest, Local Flood Risk Management Strategy	<ul style="list-style-type: none"> Provides an overview of flood risk management work being undertaken and planned throughout the borough Outlines how we are working with partners to reduce flood risk Clearly sets out which organisations are responsible for different types of flooding in the borough
London Borough of Newham, Local Flood Risk Management Strategy	<ul style="list-style-type: none"> Specifies the roles/management functions of the different authorities that have responsibilities for managing flood risk in Newham Describes how Newham is working with partners to reduce flood risk Provides an overall assessment of local flood risk Sets out the objectives for managing local flood risk Outlines measures/actions to be taken to meet those objectives and how and when these measures/actions are expected to be implemented Sets out the costs and benefits of the measures, and how they are to be paid for Describes how the strategy contributes to the achievement of wider environmental objectives
Local Flood Risk Management Strategy, London Borough of Tower Hamlets London Borough of Hackney, Local Flood Risk Management Strategy Haringey London, Local Flood Risk Management Strategy	<ul style="list-style-type: none"> Improve knowledge and understanding of flood risk within the borough Maintain flood risk management and drainage assets Deliver sustainable drainage systems Ensure new developments reduce the risk of flooding Work with Risk Management Authorities and partners to manage flood risk Respond effectively to flooding emergencies

Management Plan (Hyperlink)	Key aspects that align with the DWMP
Managing Flood Risk in Camden, The London Borough of Camden Flood Risk Management Strategy	<ul style="list-style-type: none"> Understand and explain the level of risk affecting the residents and businesses of Camden Provides an action plan for areas in particular, businesses and residents in Camden should be taking to manage flood risk Take a sustainable and holistic approach to flood management, seeking to deliver wider environmental and social benefits
Local Flood Risk Management Strategy, City of Westminster	<ul style="list-style-type: none"> Better understand and explain the level of local flood risk affecting Westminster Take a sustainable, holistic approach to flood risk management in Westminster Managing the likelihood of flooding versus the risk of harm to people, economy and environment Promote preparedness and resilience to local flood risk Ensure that the planning process takes full account of local flood risk Adopt a collaborative approach to manage flood risk in Westminster with partners, businesses and residents
City of London Corporation, Local Flood Risk Management Strategy	<ul style="list-style-type: none"> Provides up to date information regarding the level of flood risk within the city taking account of emerging climate change impacts Reduce the vulnerability and cost to city businesses, residents and visitors of flood risk Respond effectively in the event of flooding providing emergency assistance to those in need Assist in recovery enabling the city residents and businesses to resume normal activities promptly Engage with other flood risk management authorities taking action to reduce flood risk through partnership working within and beyond the city's boundaries
Brent, Flood Risk Management Strategy	<ul style="list-style-type: none"> Improving the understanding of flooding risks in Brent Reducing the risk of flooding for people and businesses in Brent Provides clear information on the roles and responsibilities of everyone involved in flood risk management in Brent Ensuring that emergency plans and responses to flood incidents in Brent are effective To take a sustainable and holistic approach to flood management, seeking to deliver wider environmental and social benefits

Management Plan (Hyperlink)	Key aspects that align with the DWMP
London Borough of Ealing, Local Flood Risk Management Strategy	<ul style="list-style-type: none"> Develop and improve the understanding of flood risk across the borough Maintain and improve communication and cooperative working between strategic parties and flood risk management authorities Prevent the increase of flood risk from inappropriate development Develop community awareness of flood risk and ways of reducing the risk in the future Identify and implement flood mitigation measures where funding can be secured
Hammersmith & Fulham Council, Local Flood Risk Management Strategy	<ul style="list-style-type: none"> Understanding flood risk posed to the region and creating a method of capturing data Working with key stakeholders and other Risk Management Authorities Decreasing flood risks through the planning process Decreasing flood risks through other means Raising public awareness
Local Flood Risk Management Strategy, The Royal Borough of Kensington and Chelsea (Draft)	<ul style="list-style-type: none"> Coordinate the management of flooding from different sources (working in partnership with other flood risk authorities to ensure we are prepared for a flooding event and we can recover promptly) Communicate flood risk effectively amongst council departments, other flood risk authorities and the public Reduce flood risk and its consequences Gather information and undertake research about flood risk (which could aid a future policy review) Undertake a review of planning policies to ensure flood risk is fully addressed
Islington, Local Flood Risk Management Strategy	<ul style="list-style-type: none"> Improve flood risk understanding of properties, communities and infrastructure at risk of flooding from surface water, groundwater or ordinary watercourses Support sustainable growth and development by understanding the needs of all parties and ensuring the best evidence feeds into decision-making Maximise use of resources through targeted flood management and partnership working Improve local community preparedness for flooding events, and co-ordinate stakeholders involved in community flood risk management to ensure efficient warning and recovery

Management Plan (Hyperlink)	Key aspects that align with the DWMP
Surface Water Management Plans	
Essex County Council, Surface Water Management Plans	<ul style="list-style-type: none"> Aims to understand the risk from local flood sources and outline a long-term action plan to manage these risks
Surface Water Management Plans: London Borough of Waltham Forest London Borough of Newham London Borough of Tower Hamlets London Borough of Hackney London Borough of Haringey London Borough of Camden City of Westminster London Borough of Brent London Borough of Hammersmith and Fulham The Royal Borough of Kensington and Chelsea	<ul style="list-style-type: none"> These reports outline the preferred surface water management strategy for the boroughs. In this context, surface water flooding describes flooding from sewers, drains, groundwater, and runoff from land, small watercourses and ditches that occurs as a result of heavy rainfall. It establishes a long-term action plan to manage surface water and will influence future capital investment, maintenance, public engagement and understanding, land use planning, emergency planning and future developments.
Sustainability and Planning	
Thames Estuary TE2100 Plan, Environment Agency	<ul style="list-style-type: none"> Take an adaptive approach to managing the risk of flooding to people, property and the environment Protect the social, cultural and commercial value of the tidal Thames, tributaries and floodplain Ensure sustainable and resilient development in the floodplain Tackle the climate crisis by enhancing and restoring ecosystems and maximising benefits of natural floods
The London Plan	<ul style="list-style-type: none"> An integrated economic, environmental, transport and social framework for the development of London over the next 20-25 years

Management Plan (Hyperlink)	Key aspects that align with the DWMP
SuDS Design and Evaluation Guides	
The Sustainable Drainage Systems Design Guide for Essex	<ul style="list-style-type: none"> Guidance on the planning, design and delivery of attractive and high-quality SuDS schemes which should offer multiple benefits to the environment and community alike
Sustainable Drainage Design and Evaluation Guides: Newham London The Royal Borough of Kensington and Chelsea Hackney Haringey	<ul style="list-style-type: none"> Promotes the idea of integrating SuDS into the fabric of development using the available landscape spaces as well as the construction profile of buildings, to provide more interesting surroundings, cost benefits, and simplified future maintenance
SuDS Guidance, London Borough of Tower Hamlets	<ul style="list-style-type: none"> The inclusion of SuDS in developments across the borough
Green/Blue Infrastructure Plans	
Green and Blue Infrastructure, Waltham Forest Infrastructure Delivery Plan 2020	<ul style="list-style-type: none"> Green corridors that provide more walking and cycling routes Blue Infrastructure principles also plan to de-culvert and re-wild the borough's rivers, which will be protected as key routes for wildlife and recreation
Essex Green Infrastructure Strategy	<ul style="list-style-type: none"> Protect, create, and improve green infrastructure for biodiversity and people
Hackney Green Infrastructure Strategy	<ul style="list-style-type: none"> A framework for decision-making and resource allocation that will enable the transformation of neighbourhoods in Hackney that are resilient to the effects of climate change, provide a network for wildlife to thrive and support the physical health and mental wellbeing of residents
Epping Forest District Council, Green Infrastructure Strategy	<ul style="list-style-type: none"> Ensure that a coherent and complementary approach is taken to the district's Green Infrastructure provision and a holistic and strategic approach is taken

Management Plan (Hyperlink)	Key aspects that align with the DWMP
Haringey's Greenest Borough Strategy	<ul style="list-style-type: none"> Work together to tackle climate change and secure a clean, safe and environmentally sustainable future for everyone living, working, visiting or studying in Haringey
Climate Change Action Plans	
Newham London, Climate Emergency Action Plan	<ul style="list-style-type: none"> Greening the borough
2030: Climate and Ecology Strategy and Action Plan	<ul style="list-style-type: none"> A clean and sustainable future in which human activity works to the benefit of all people and the environment
Camden Climate Action Plan 2020-2025	<ul style="list-style-type: none"> Net zero carbon Camden by 2030
Essex County Council, Adapting to Climate Change Action Plan	<ul style="list-style-type: none"> Reduce carbon emissions Reduce flooding Create and enhance green infrastructure, including trees, meadows, marshes, parks, and gardens
London Borough of Redbridge, Climate Change Action Plan	<ul style="list-style-type: none"> Commitment to become carbon neutral by 2030 for those emissions in its direct control
The London Borough of Barking and Dagenham Climate Change Strategy and Action Plan	<ul style="list-style-type: none"> Carbon neutral by 2030
Waltham Forest LSP, Climate Change Strategy	<ul style="list-style-type: none"> Resource efficiency, emissions reduction and behavioural change to help reduce future climate change and to adapt to the climate change impacts which are already inevitable
London Borough of Tower Hamlets, Net Zero Carbon Plan	<ul style="list-style-type: none"> Net zero carbon by 2025
Haringey Climate Change Action Plan	<ul style="list-style-type: none"> Reducing carbon emissions in Haringey and raising awareness about climate change across our borough

Management Plan (Hyperlink)	Key aspects that align with the DWMP
Zero Carbon City 2040, Westminster Climate Emergency Action Plan	<ul style="list-style-type: none"> • Net zero emissions across the borough by 2040
City of London, Climate Action Strategy 2020-2027	<ul style="list-style-type: none"> • Net zero by 2027 in the City Corporation's operations • Net zero by 2040 across the City Corporation's full value chain • Net zero by 2040 in the Square Mile • Climate resilience in our buildings, public spaces and infrastructure
Brent Climate & Ecological Emergency Strategy 2021-2030	<ul style="list-style-type: none"> • Supporting communities • Nature and green space • Homes, buildings and the built environment
Ealing Council, Climate and Ecological Emergency Strategy	<ul style="list-style-type: none"> • Commitment to use our influence to reduce emissions emitted across the borough
The Royal Borough of Kensington and Chelsea, Air Quality and Climate Change	<ul style="list-style-type: none"> • Reduce emissions • Reduce exposure and increase resilience • Influence change
Epping Forest District Council Climate Change Action Plan	<ul style="list-style-type: none"> • Behaviour change • Natural environment • Climate change adaption
Vision 2030: Building a Net Zero Carbon Islington by 2030	<ul style="list-style-type: none"> • Improve the energy efficiency and reduce the level of carbon emissions of all buildings and infrastructure • Deliver on our net zero carbon target
Integrated Water Management Plans	
Isle of Dogs and South Poplar Integrated Water Management Plan	<ul style="list-style-type: none"> • Increasing resilience through provision of reliable water services and reducing the impact of flooding • Supporting the delivery of Net Gain and Urban Greening through making space for water • Providing sustainable drainage to minimise and reduce flood risk and improve water quality • Protecting and enhancing the water environment



Issues today

The initial [risk-based catchment screening](#) (RBCS) in this region, published in 2019, assessed system performance against a range of 17 indicators, using information from company reporting systems or from relevant stakeholders, to identify systems that are vulnerable to the risks of growth and climate change. We identified that this system warranted long-term planning with 11 of the 17 indicators being breached.

As part of optioneering we have then assessed the catchment against a series of planning metrics as shown in the table below.

This assessment shows that the risk is low in risk zones 4, 5 and 6. This process identified the highest risk for each metric in risk zones 1, 2 and 3 which have then progressed through optioneering, solution development and into the appraisal phases.

The DWMP process is iterative and will be repeated every 5 years, with the next version due in 2028. This will capture any changes in demands for this catchment, incorporate the outputs from the [review of the 2021 floods](#) and will look for opportunities to utilise future technologies and engineering solutions.

Risk							
Risk Zone	Storm Overflow Performance	Internal Sewer Flooding	External Sewer Flooding	Resilience (1 in 50-year storm)	Surcharging	STW Quality Compliance	STW DWF Compliance
(STW)	N/A	N/A	N/A	N/A	N/A	Yes	Yes
1	Yes	Yes	Yes	No	No	N/A	N/A
2	No	Yes	Yes	Yes	Yes	N/A	N/A
3	Yes	No	No	No	Yes	N/A	N/A
4	No	No	No	No	No	N/A	N/A
5	No	No	No	No	No	N/A	N/A
6	No	No	No	No	No	N/A	N/A

'N/A' indicates that a particular risk is not applicable/cannot be quantified either to/for the STW or risk zones



Our predictions for the future

We've modelled the entire system against future challenges, assessed targets and carried out discussions with local stakeholders and forecast that, if we do nothing and do not implement the DWMP, over the next 25 years there will be an increased risk of hydraulic sewer flooding and pollution from our sewerage systems.

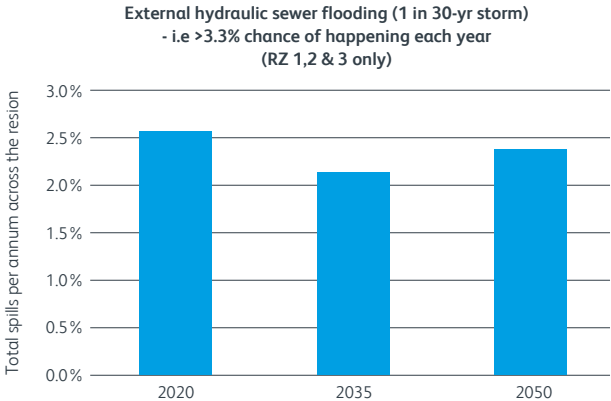
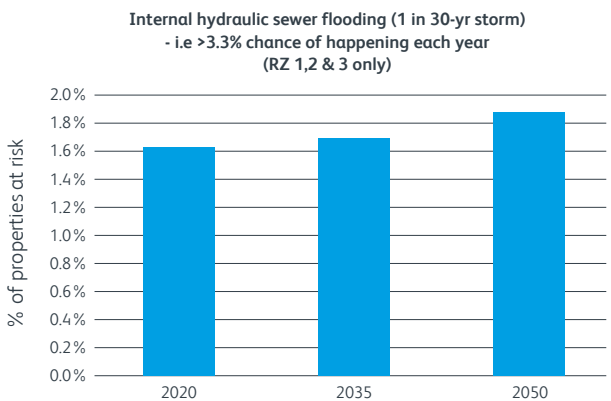
We modelled the impact of climate change, population growth and urban creep on flood risk, pipe capacity, treatment works compliance and storm overflow compliance from a 2020 baseline, which includes the Thames Tideway Tunnel, to 2050.

This has helped determine how risk will change over time due to these factors.

The ability of STW to treat and dispose of sewage in line with current water quality and dry weather flow (DWF) discharge permit conditions was assessed. The results presented below indicate that without improvements, DWF performance and water quality compliance will worsen over time. We are currently upgrading Beckton STW as the 2020 limits are above our target of being under 80 % of the permit limits.

Our forecast network performance metrics are summarised opposite. We forecast that by 2050, over 5 % of properties will be at risk of hydraulic sewer flooding from the sewerage system in a 1 in 50-year storm. The betterments in external sewer flooding seen in the bar charts in 2035 occurs because the model predicts that developments in brownfield sites will reduce demands on the sewerage network.

Change in risk if we do nothing and do not implement the DWMP



Beckton STW water quality and DWF compliance

	2020	2025	2030	2035	2040	2045	2050
Water Quality (SS* & BOD*)	94%	101%	104%	107%	109%	112%	114%
Water Quality (AmmN*)	87%	101%	104%	107%	109%	112%	114%
DWF	82%	85%	87%	87%	89%	92%	94%

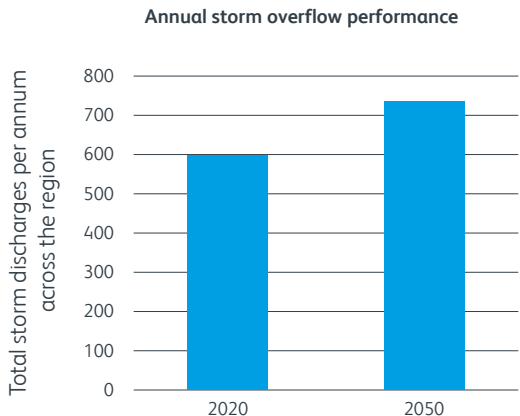
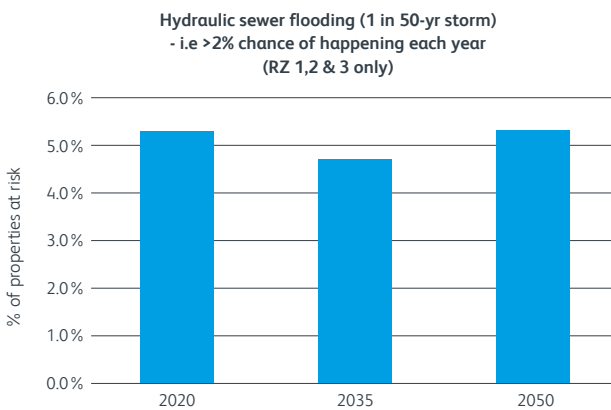
* Suspended Solids (SS)
* Biochemical Oxygen Demand (BOD)

* Ammoniacal Nitrogen (AmmN)

Based on our findings from modelling and from discussions with local stakeholders, we forecast that if we do nothing, over the next 25 years there will be an increased risk of hydraulic sewer flooding and pollution from our sewerage systems in this region. Therefore, there is an evident need for long-term planning and the implementation of the DWMP, to protect this region and support its future growth.

If you are a DWMP practitioner, further details can be found on our Practitioner portal.

[DWMP Practitioner portal](#)



2020 and 2050 modelled overflow data in DWMP catchments due to hydraulic incapacity

Sustainable solutions

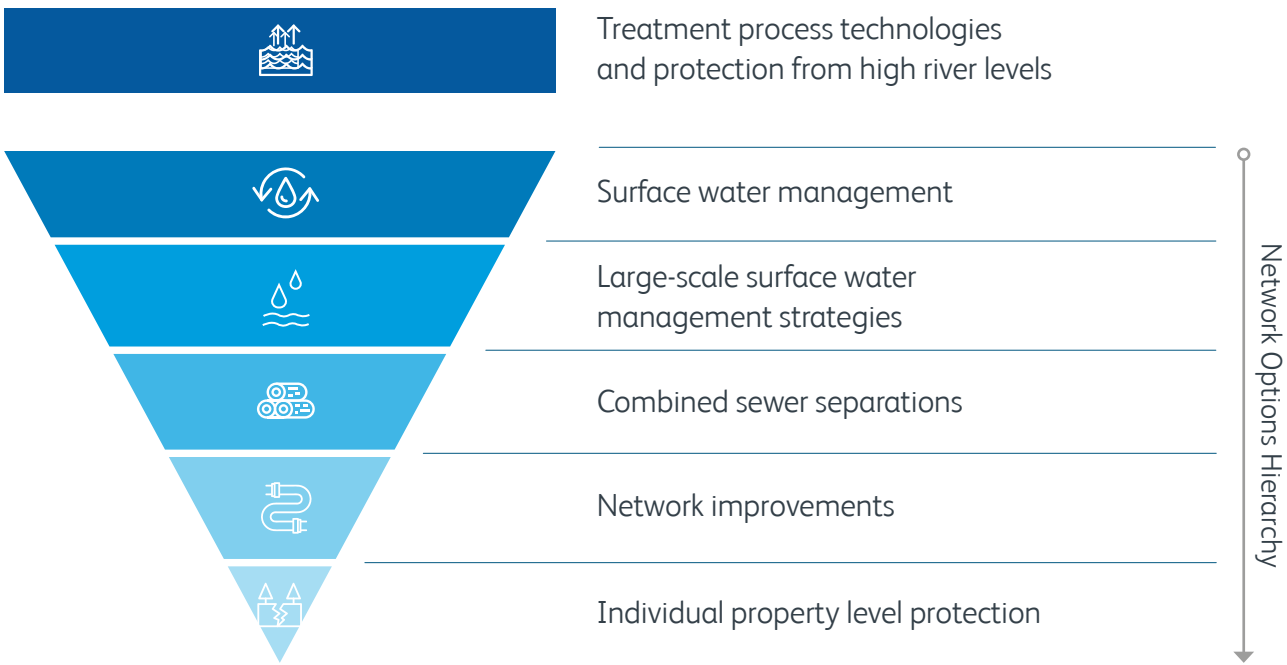
We've combined our knowledge of the catchments with the stakeholder feedback we've received to help us identify the solutions required to meet the future needs of this region. We've used a structured approach that started with over 40 generic solutions, to ensure broad thinking, and identified and assessed the feasibility of a wide range of potential interventions and the extent to which they resolve the area's future needs.

Our approach has followed the same method that has been developed and implemented successfully over many years for our Water Resources Management Plans (WRMP).






Our stakeholders, like us, want this DWMP to work in balance with the natural environment and make the best use of available land.

Our hierarchy of options follows this principle - it focuses first on maximising the efficient use of existing assets, then prioritising natural surface water management solutions over network improvements.

The sustainable solution options we've considered for this area are outlined below. To view our spatial analysis of the potential solutions that have been reviewed, scoped out or selected visit our [DWMP portal](#).



Solution options considered in optioneering

<h3>Surface water management</h3> <p>Surface water separation and the installation of features to collect, store and/or infiltrate surface water from buildings and impermeable areas, such as driveways and car parks as part of enhancing our surface water sewerage system. This option also looks to reinforce the fundamental basis of our sewerage systems being separate by addressing property misconnections of surface water into the foul sewer system or foul to surface water.</p> 	<h3>Large-scale surface water management strategies</h3> <p>Delivery of surface water management strategies across the risk zones to significantly reduce or remove the rainfall runoff entering the foul sewer system at these locations.</p> 	<h3>Combined sewer separations</h3> <p>Converting existing combined sewers to dedicated surface water and foul water sewers. The partitioning of the systems will provide capacity relief at times of high rainfall. Surface water can be conveyed on the surface using SuDS measures.</p> 	<h3>Network improvements</h3> <p>Managing the impact of surface water on the sewerage system through the identification of network improvements to address deficiencies in the sewerage network capacity, specifically in areas with deliverability constraints and a high risk of sewer flooding now or in the future. This includes the construction of large attenuation sewers, new surface water and foul water sewers.</p> 	<h3>Individual property level protection</h3> <p>Providing vulnerable homes with active and passive flood protection measures such as flood proof doors, self-sealing bath/shower systems (non-return valves) and installation of household pumping stations.</p> 	<h3>Treatment process technologies and protection from high river levels</h3> <p>Implementation of a range of different technologies identified to enhance the performance of the STW, through either retrofitting or new-build options. This will include the use of more intensive wastewater treatment processes which have the capacity to meet future demands and the construction of flood bunds to protect our assets from high river levels.</p> 
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Partnership working – case studies

Working in partnership with our stakeholders is a fundamental component of our plan. It can provide significant potential to support delivery of mutually beneficial outcomes, address multiple drivers and deliver multiple benefits. In this section we present a few examples of partnership working opportunities in this region.

Counter Creek Opportunities

We continue our partnership work with LLFAs London Borough (LB) of Hammersmith and Fulham and Royal Borough of Kensington and Chelsea in the Counters Creek catchment, where properties have experienced hydraulic sewer flooding following heavy rainfall. A number of key locations have been identified to develop collaborative schemes to help relieve the flood risk.

Examples of these locations include the Earls Court and Lillie Road area, a densely urbanised area where an investigation is proposed to explore the potential for measures such as SuDS to capture rainwater and slow the runoff of surface water entering the sewer network, whilst also providing additional environmental and social benefits.

The Holland and Addison Road area has also been identified for collaborative SuDS schemes to manage surface water runoff and reduce the risk of sewer flooding, and could also include working with Transport for London.

Fillebrook Opportunities

The Fillebrook is a lost urban river in the London Borough of Waltham Forest (LBWF). Its catchment has been identified as a Critical Drainage Area in LBWF’s Surface Water Management Strategy as a result of the number of properties at risk of flooding. A range of opportunities with a variety of stakeholders exist in the catchment to develop collaborative SuDS schemes that collectively can provide environmental and social benefits, through the addition of new green spaces which can also help to reduce flood risk in the catchment. These include:

Leyton Sixth Form College and Whipps Cross Hospital

Phase 1 of the scheme comprises of SuDS including detention basins and swales that will attenuate surface water on the Leyton Sixth Form College site. The future development of Whipps Cross Hospital provides a further unique collaboration opportunity to develop a Phase 2 of the scheme

to provide additional surface water attenuation in the upper reaches of the Fillebrook catchment.

This represents an opportunity for partnership funding with multiple partners that will benefit from the scheme including Leyton Sixth Form College, Barts Health NHS Trust, LBWF, the Environment Agency, TRFCC and Thames Water.

New Spitalfields Market

A masterplan for the New Spitalfields Market is currently being developed by LBWF, with the current market site due to be vacated when the market is moved to a new facility. This represents a longer term redevelopment opportunity within the Fillebrook catchment and the opportunity proposes an ecologically-rich, new public space organised around a de-culverting of the Dagenham Brook, and incorporation of SuDS features at an early planning stage.



Opportunity	Partners
New Spitalfields Market site	LBWF
Earls Court	LB of Hammersmith and Fulham and Royal Borough of Kensington and Chelsea
Holland Road	LB of Hammersmith and Fulham and Royal Borough of Kensington and Chelsea
Leyton Sixth Form College Flood Mitigation Project	Environment Agency (Local Levy funding), Thames RFCC 2021 – 2027 Flood programme (GiA funding) and Waltham Forest Council
South and West Hampstead Cluster	Environment Agency, Resident Groups and Transport Agencies
Fairhazel Gardens and Goldhurst Terrace	Camden Council
Willesden Green and Chamberlayne Road	Brent Council
Cross Lanes - Priory Park Flood Alleviation Scheme	Environment Agency
Westwood Recreation Ground – Environmental Improvement Scheme	Redbridge LLFA (supported by Metis Consultants) and Environment Agency
Junction of Osbaldeston Road with Northwold Road	Hackney Council
Junction of A10 (Stamford Hill) with Cazenove Road	Hackney Council

These opportunities have been identified following a detailed screening and prioritisation exercise with our partners. This approach is explained in the [Appendix S Partnership Opportunities and Working](#) report.

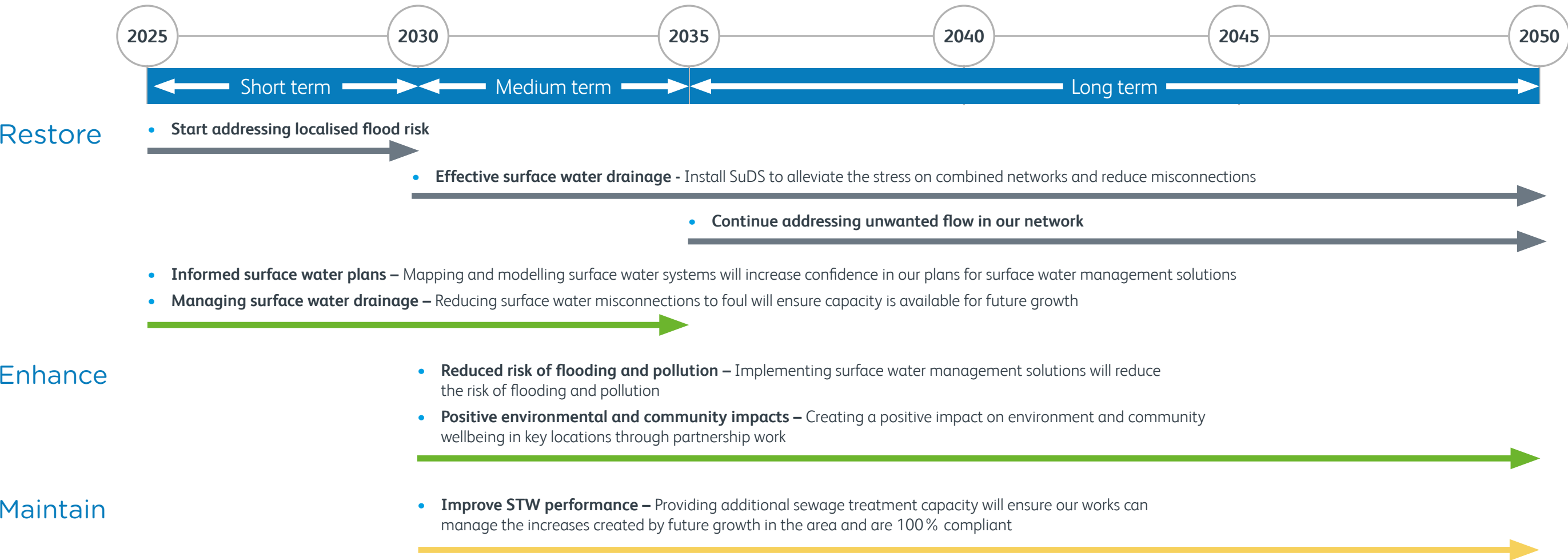
Our shared plan

Our shared long-term plan for the Beckton system has been formulated based on a balance of how deliverable and sustainable the proposed interventions are, and also how cost efficiently they can deliver multiple benefits. The challenges this region has presented us in delivering that balance have included:

- Population growth uncertainties
- Incomplete mapping of surface water systems e.g. sewer, highway or land drainage and the extent of our hydraulic surface water sewerage network model coverage
- Location of property level misconnections
- Ownership and maintenance of SuDS

We propose a phased plan for this region. We'll restore assets to their original purpose, for example we'll remove the misconnections of surface water to the foul water system and seal our manholes so that our foul water systems respond less to storms and are more resilient to climate change.

To enable this in the short and medium term we will start with the implementation of sustainable urban drainage measures to reduce unwanted flow into our sewers. The diagram below outlines the sequencing of our proposed interventions for this region.



Adaptive pathway planning at Beckton STW

Beckton is Thames Water’s largest sewage treatment works. We’ve developed different solution pathways to ensure it’s resilient to the demands of future growth and climate change.

The immediate issues

- There is sufficient biological capacity on site to cope with the current population, with scope for accepting a growing population, however, the site suffers from several deficiencies which affect our ability to unlock this capacity.
- The current planned AMP7 upgrades will provide treatment capacity to a 2030 design horizon with improved plant efficiency and refurbishment of existing processes.

Our solution pathways options

Lack of available land prevents site expansion, so we have the following future strategic options illustrated as an adaptive pathways map:

- Replace our second treatment stream Activated Sludge Process (ASP2) with new technology
- Decommission and rebuild ASP2

The drivers behind our different solution pathways are:

- Planning constraints on new plant
- Rate of population growth
- Environmental concerns
- Regional requirements for additional water
- Appetite for risk of Thames Water and customers

On-site intensive waste treatment technologies

We need more capacity to treat ammonia from 2030 onwards. We have considered three different technologies and an interim process (that is high on chemical consumption). We believe we can accommodate growth up to 2100 using various combinations of these technologies. The options considered are as follows:

Nereda®

A type of granular activated sludge process

Dissolved Air Flotation (DAF)

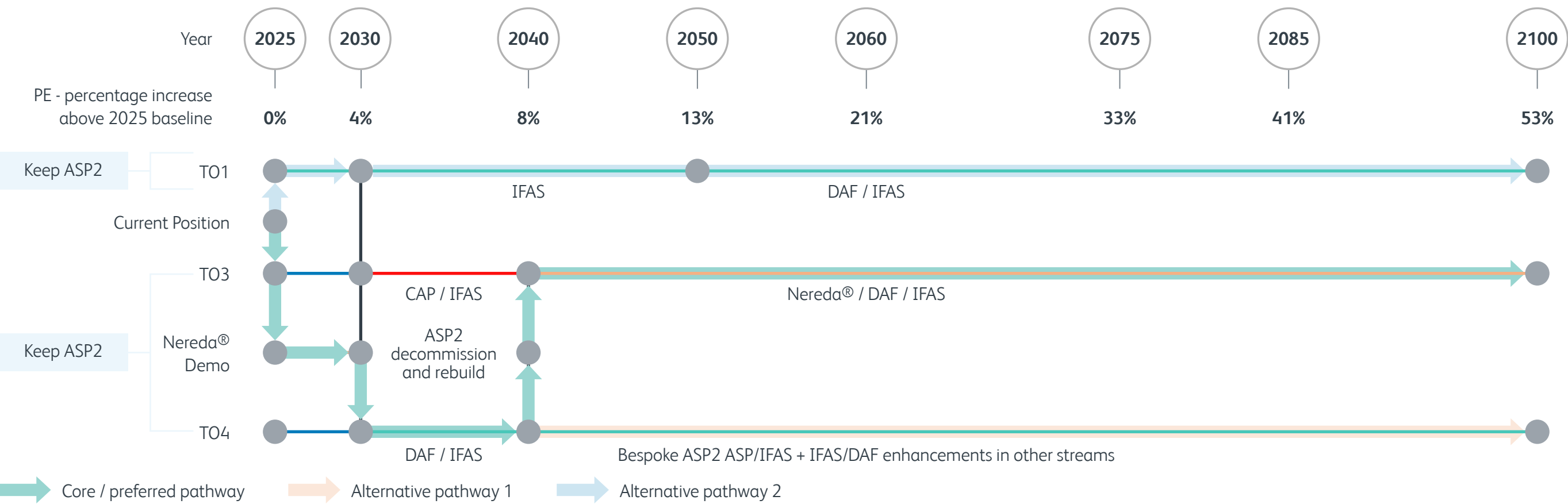
Replace some primary sedimentation tanks (or add additional DAF units)

Integrated Fixed film Activated Sludge plant (FAS)

Plastic media inserted into the activated sludge lanes to enhance ammonia removal

Chemically Aided Precipitation

Treatment in which chemicals are added to reduce solubility and generate sedimentable particles



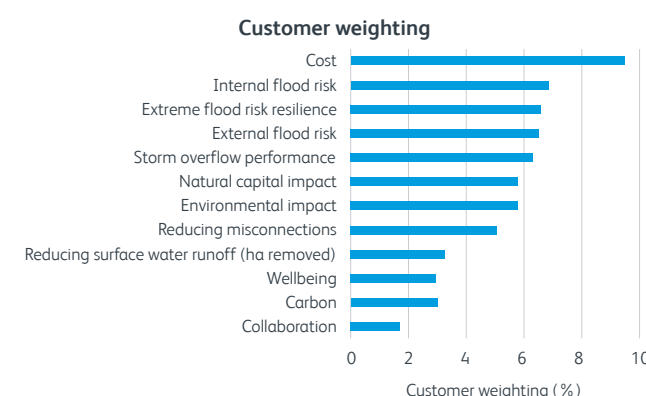
Developing our preferred plan for Beckton

Defining a best value framework

A best value framework is one that considers broader criteria than just economic cost. So our DWMP maximises outcomes for the communities it serves. Our criteria are based on the 12 planning objectives of the DWMP with additional criteria to capture broader environmental impact.

Defining what our customers and stakeholders value

We have used quantitative customer research to determine the relative priorities of the different criteria.



Agreeing scenarios with stakeholders

For our London catchments our approach has focused on a programme of storm discharge and flooding reduction that meets targets in each of the thirty-five risk zones. We identified and agreed scenarios to cover the range of our ambitions through discussion with our regional stakeholders.

Alternative plans and outcomes

Maintain flooding resilience - delivers the statutory storm discharge reduction requirements and maintains property flooding at 2025 levels

Maximum community benefit - meets our DWMP sewer flooding objectives and delivers our storm discharge reduction plan for high priority sites by 2035 and all sites by 2045 whilst also creating the most benefit to communities and the environment

Resilient - constrained - meets our sewer flooding planning objectives and delivers our storm discharge reduction plan for high priority sites by 2035 and all sites by 2045. Delivers a feasible level of surface water management within the first 10 years of the plan

Accelerated / deliver sooner - accelerates investment to deliver our performance outcome targets sooner, including our storm discharge reduction at all sites by 2035, reflecting views expressed by stakeholders in the public consultation

To avoid customer bill volatility, we also explored alternative investment profiles that define how quickly options are implemented. We also considered a better information plan that includes factors such as improvements in overflow and river monitoring data and improved accuracy in our hydraulic modelling to predict flood risk.

Scoring our options against our planning objectives

Scores have been generated for every option for each of our planning objectives and weighted based on our customer priorities. For example, DWMP with additional criteria to capture broader environmental impact.

Natural capital (NC) impact

We used data from Natural England on the existing NC in the catchment and assessed whether the option would improve or reduce this baseline based on additional green space generated. Surface water management schemes scored highly whilst new sewers and tanks scored lower.

Wellbeing impact

We used data on environmental factors in the catchment that influence population and human health, including improved access to recreation and the environment, and assessed whether the option would improve or reduce this baseline.

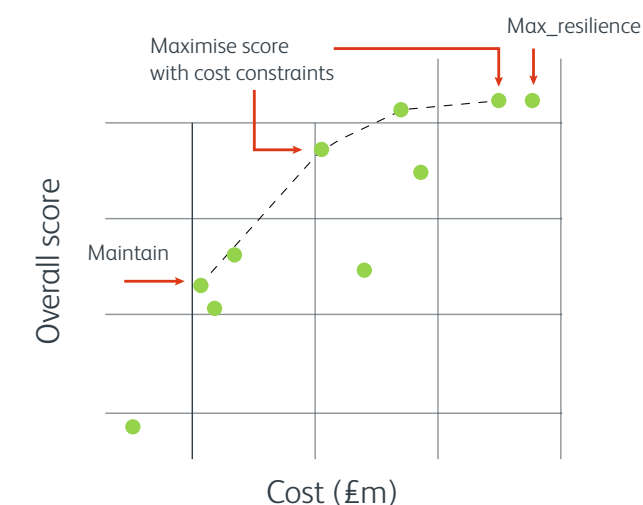
Reducing misconnections

We assessed the area to be disconnected from our foul and connected into our surface water systems as part of our options.

Assessing different scenarios

We used a decision support tool to optimise our plan based on our 'value criteria'. We tested multiple alternative plans to allow us to assess different scenarios and compare their outcomes.

Illustrative score vs cost



Determining our preferred plan

Our preferred plan has been developed by considering a range of factors including:

- affordability
- deliverability
- performance outcomes
- strategic environmental appraisal
- stakeholder feedback

This has allowed us to develop an adaptive plan that recognises areas of risk and uncertainty, where improved understanding will be used to prioritise interventions at key decision points over those that can be deferred. Our preferred plan balances our ambitions, our stakeholder and customer desires, our planning objectives and affordability.

Our preferred plan for Beckton

From the first iteration of our preferred plan for Beckton, we estimate that to tackle growth and climate change we need to invest an additional £3.8bn over the period 2025 to 2050, on top of our day-to-day maintenance activities.

We aim to reduce this cost requirement in subsequent iterations of our DWMP through partnership benefits, innovation and better targeting with enhanced surface water system knowledge.

Our asset strategy for our systems in London is to deliver a storm discharge and flooding reduction programme that will meet our targets in each of the 35 risk zones by 2050 allowing for climate change and growth.

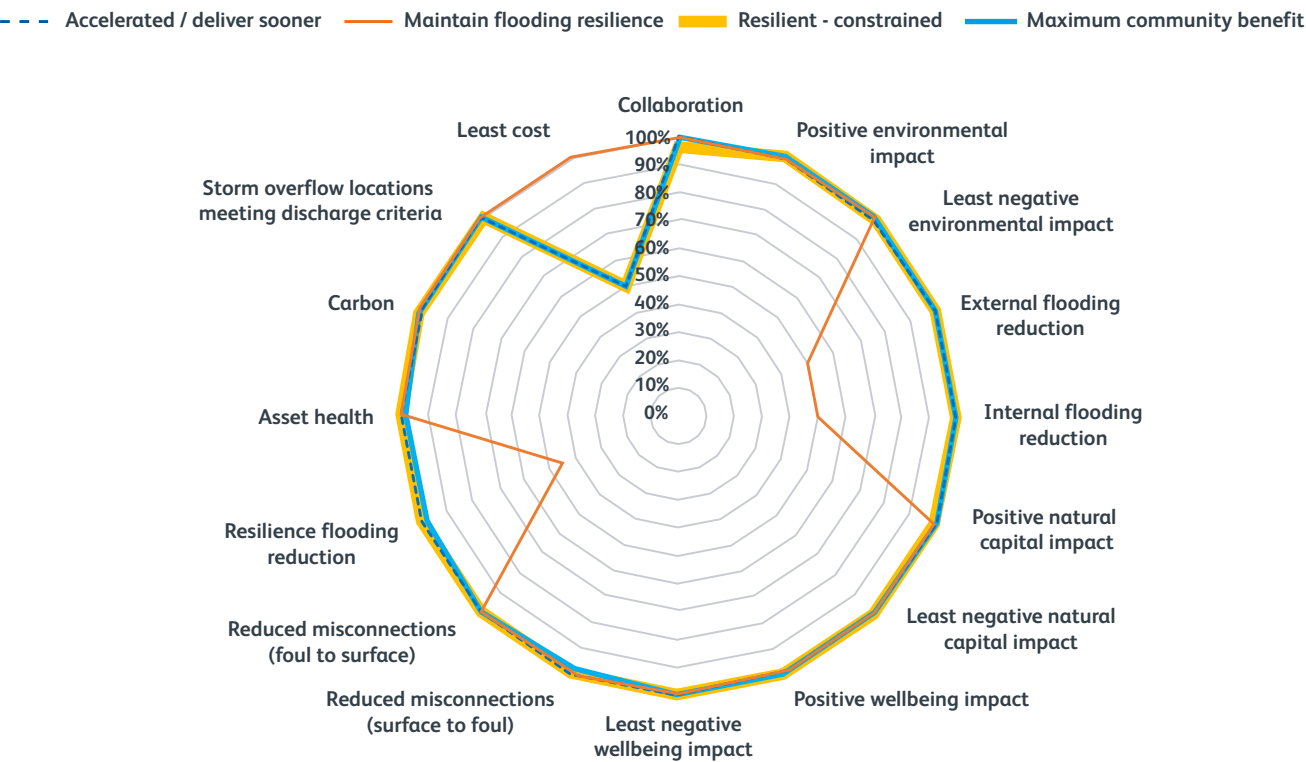
Our preferred plan comprises options that have been developed to meet medium term (2035) and long term (2050) performance targets.

Our hierarchy of solution types commences with, and seeks to maximise the implementation of, and benefit from sustainable urban drainage solutions.

- £1.9bn on managing the impact of surface water on the sewerage system including construction of new sewers, sewer upsizing and attenuation storage to provide additional capacity
- £1.5bn on improvements to surface water management, with a particular focus on removing surface water from impacting on the networks
- £323m upgrading the Beckton STW
- £4m on individual property level protection

Our preferred plan (resilient - constrained) has been optimised to offer the best value solution to reduce sewer flooding, protect the environment, and enhance natural capital as shown in the relative performance of our preferred plan figure.

Relative performance of our preferred plan



Storm overflow performance

Reduce the number of average annual storm discharges by 259. By 2050, none of the 109 storm discharge locations in this catchment will overflow more than ten times per annum on average

Property flooding

Protect 8,006 properties from internal sewer flooding up to a 1 in 30-year storm event
Protect 8,207 properties from external sewer flooding up to a 1 in 30-year storm event
Protect 20,920 properties from sewer flooding up to a 1 in 50-year storm event
If we don't invest, over 3.7 % of properties would be at risk in a storm up to a 1 in 50-year in 2050. As a result of implementing DWMP, this would reduce to 2.5 %

Treatment capacity enhancements and/or protection from high river levels at the STW

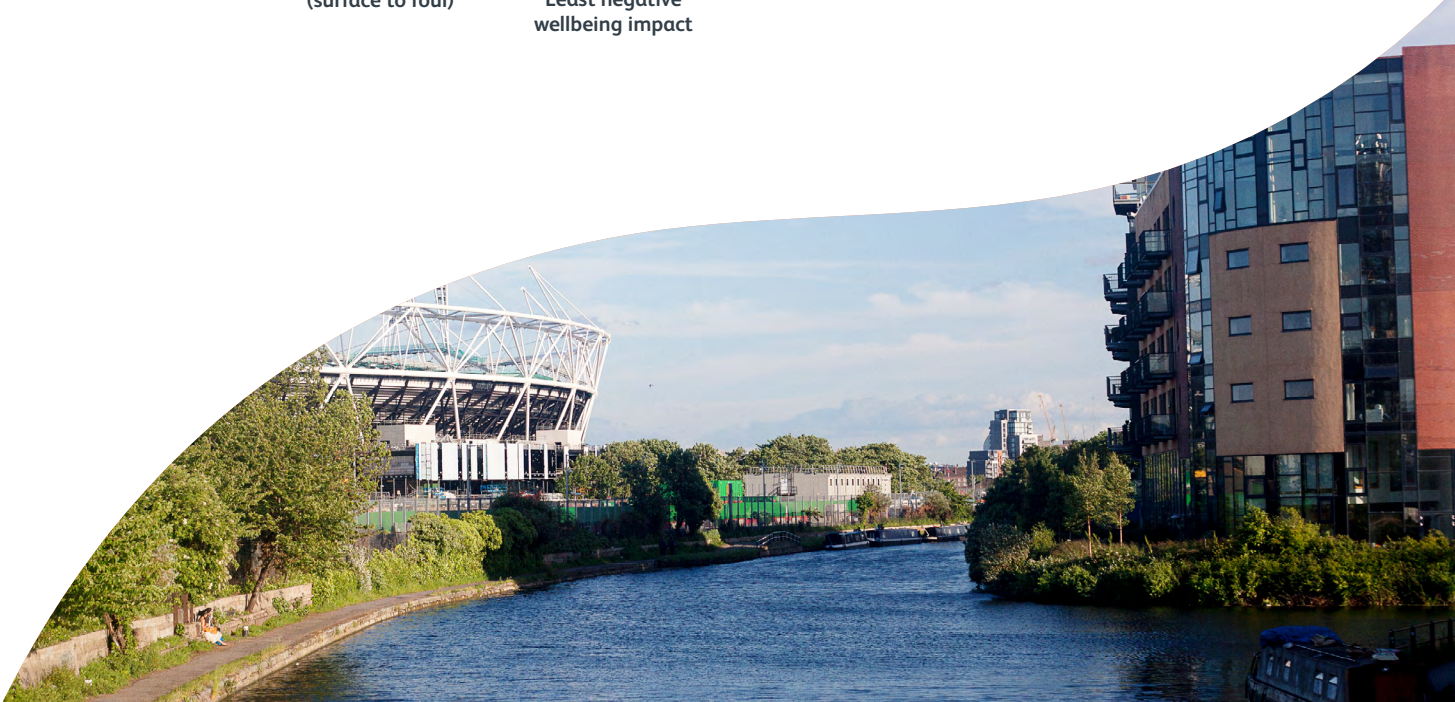
Upgrade the Beckton STW by 2050

Reduce misconnections / Reduce surface water runoff

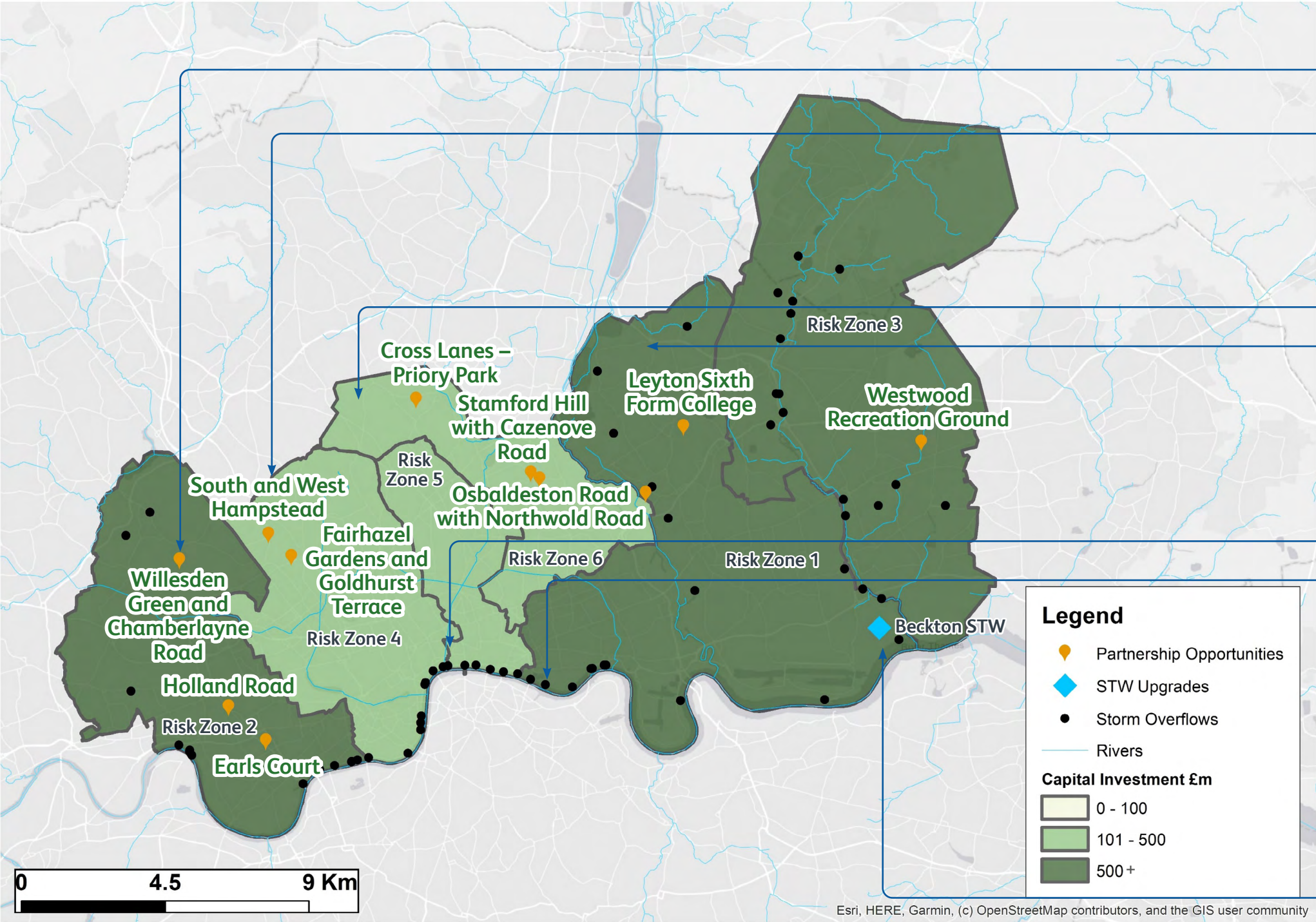
1,104 ha (equivalent to 73,600 properties) to be disconnected from our sewers and reconnected to a surface water sewer with attenuation or to a soakway

Carbon

417,010 tonnes of carbon in delivering the plan, with 8,417 tonnes of carbon sequestered in delivering the plan



Our preferred 25 year plan for Beckton



We've mapped a selection of the partnership opportunities in this region where we could work together with our stakeholders. If you are a DWMP practitioner, further details can be found on our [Practitioner portal](#).

This map illustrates the range of investment required for each of the risk zones in the system.

These are the storm overflows which have been modelled and targeted to ensure they have no adverse impact on the receiving watercourse by limiting the average number of storm discharges to <10 times per year.

Upgrades to the STW will be required over the next 25 years to ensure treatment capacity keeps pace with growth.

Next steps

Final version of the plan

We've progressed and enhanced our DWMP since we published it for public consultation in June 2022. We've updated our draft plan based on our ongoing DWMP work and our responses to regulatory updates and the majority of the feedback received during the 12-week consultation period.

Our preferred plan balances our ambitions, our stakeholder and customer desires, our planning objectives and affordability.

Further stakeholder input

This is our first DWMP and it will be the launch pad for future DWMP cycles that will occur every five years where growth, risks and system performance will be re-assessed and reviewed and the DWMP process repeated. We hope that we will receive a similar level of engagement and co-creation from our stakeholders in the next iteration as it has been a valuable contribution to this first iteration.

Funding and delivery

This DWMP is a 25-year rolling strategic plan. The first 5-years of the plan will be assessed through the price review process to confirm the funding to deliver the initial phase between 2025 and 2030.

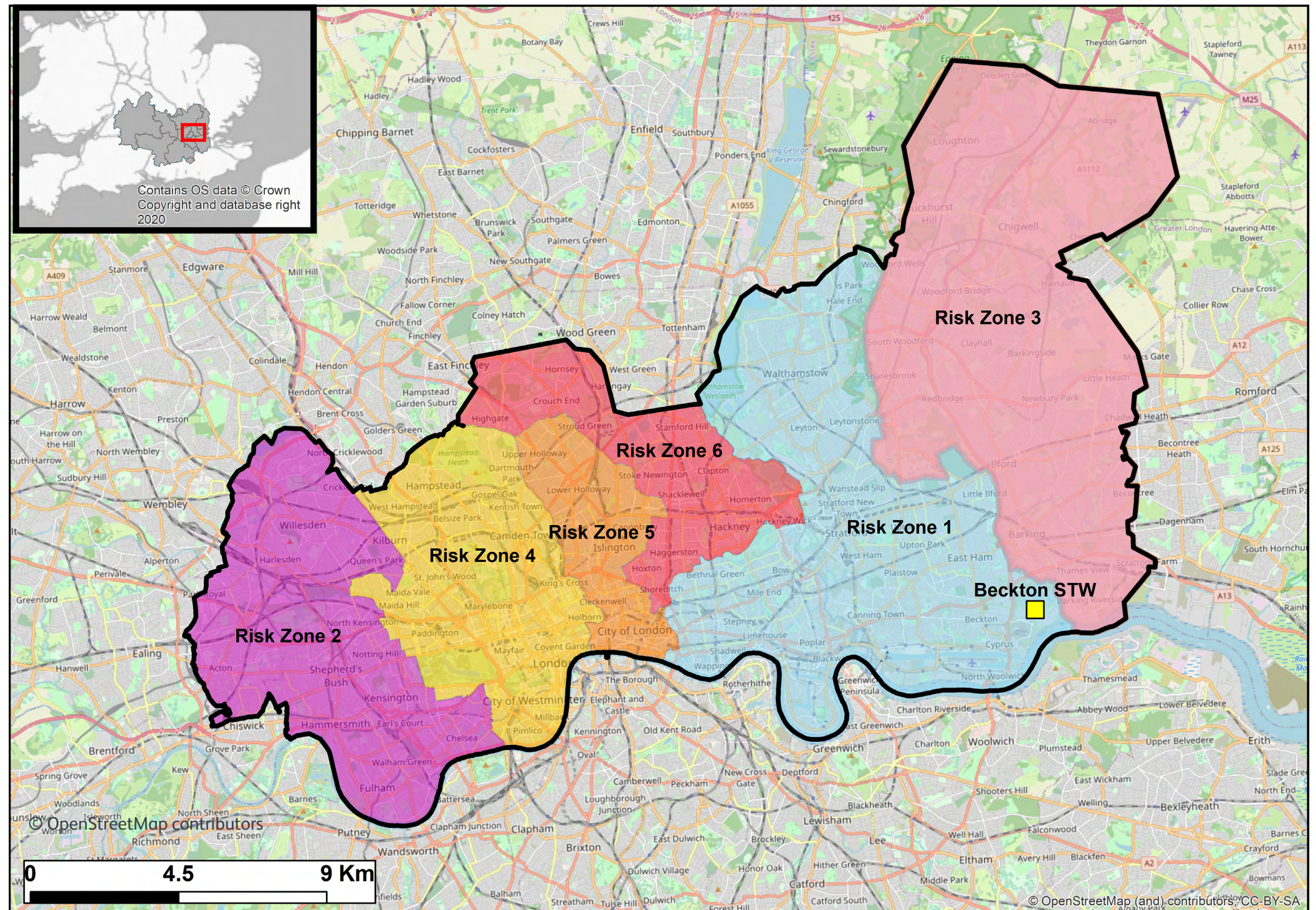
Future iterations on the plan will address elements that can't be progressed due to funding restrictions, as well as changes in customer priority or technical issues.

Our shared plan at catchment level

The map shows 6 risk zones, but only risk zones 1 to 3 have been identified as not meeting flooding targets and are included in the descriptions below.

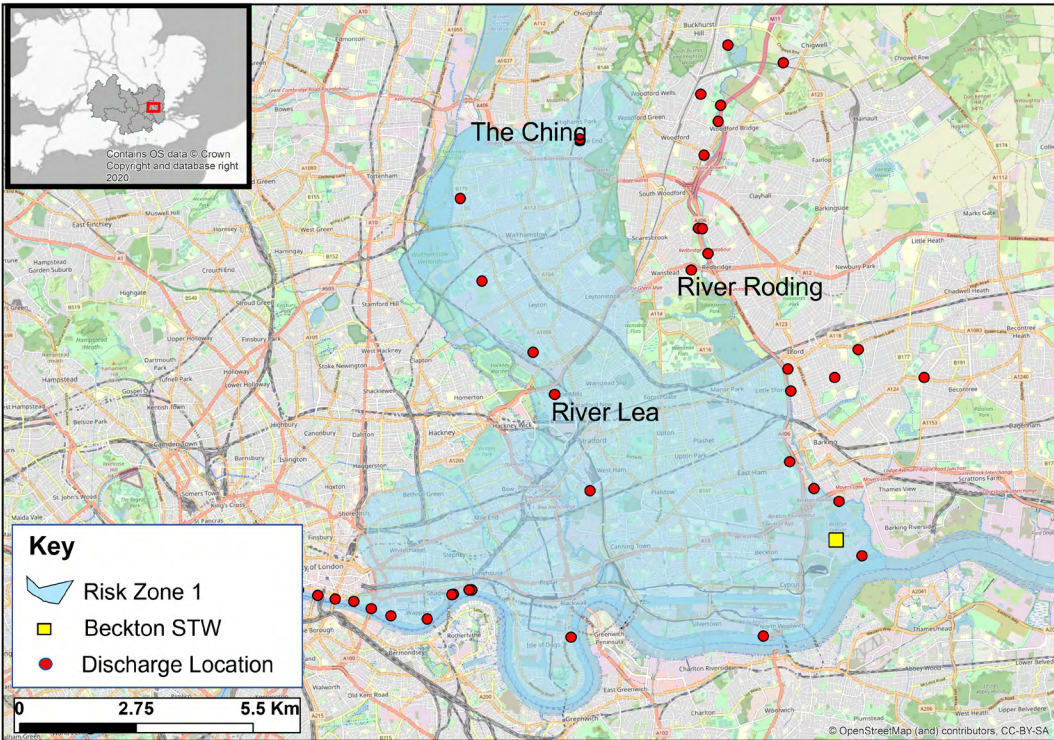
Use this interactive map by clicking on the blue boxes to find out more about our plans for the three risk zones that are predicted to breach our targets.

The risk zone table summarises the performance in all six risk zones and includes the solutions proposed in risk zones 4, 5 and 6 to address storm overflow performance and maintain the current flood risk to 2050.



Risk Zone 1 - Newham

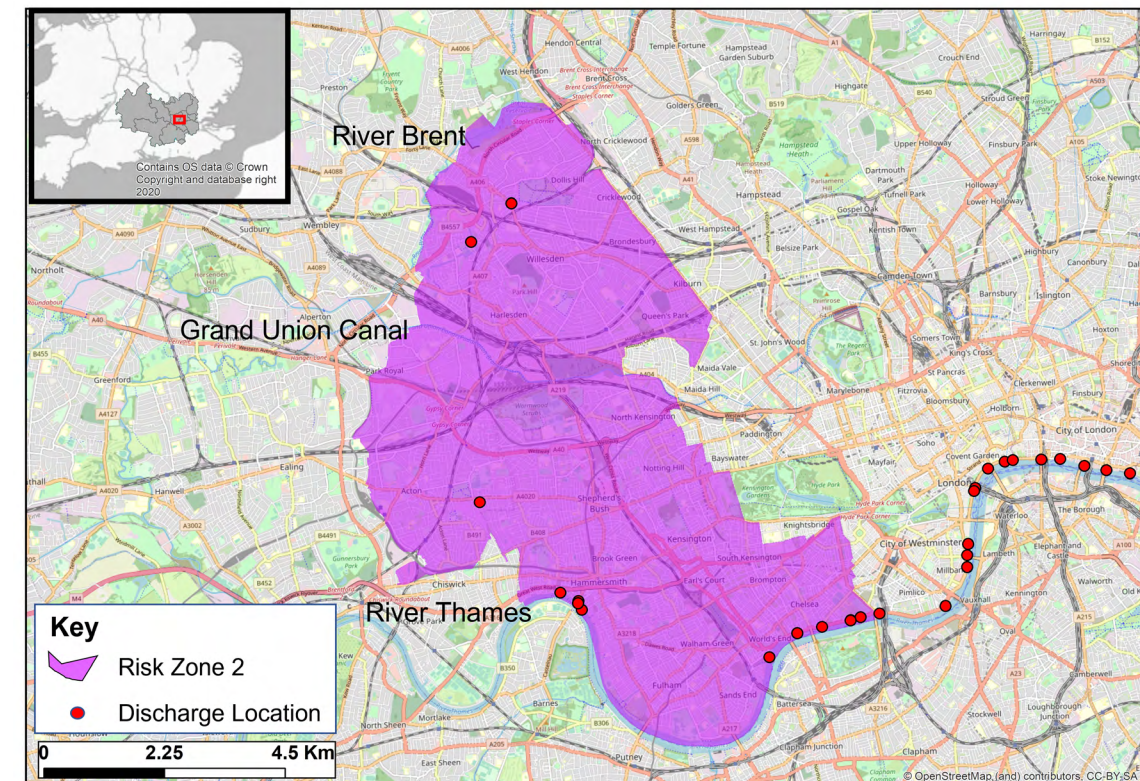
What are the challenges?	<ul style="list-style-type: none">Increased internal sewer flooding - from 1.2 % to 1.3 % of properties: Calculated as increased modelled risk of internal hydraulic sewer flooding from 1.2 % of properties (6007) at risk up to a 1 in 30-year storm in 2025 to 1.3 % of properties (6373) at risk by 2050The twenty overflows in this area discharged 431 times in 2021Beckton STW needs more capacity to treat ammonia from 2030 onwards
Which of our solutions are best suited?	<ul style="list-style-type: none">Surface water management and large-scale surface water managementNetwork improvementsConstruct deep tanks and tunnelsDisconnect existing surface water systems from combined sewers and discharge to watercourseProperty level protection measures to prevent individual buildings from hydraulic sewer floodingAdditional storage at our sewage treatment worksInvest in our sewage treatment works to achieve 100 % compliance



<div><div>2025</div><div>2030</div><div>2035</div><div>2050</div></div>				
Timescale	<div><div>←</div>Short term<div>→</div><div>←</div>Medium Term<div>→</div><div>←</div>Long Term<div>→</div></div>			
What targets are we seeking?	<div>To:</div> <ul style="list-style-type: none">• Reduce property hydraulic sewer flooding to 1.5 % (internal) and 3 % (external) for rainfall up to a 1 in 30-year storm event in any given year• Reduce storm discharges (where overflows are present) to <10 in an average year by 2050• Achieve 100 % STW permit compliance			
How will we achieve the targets?	<div>We will:</div> <ul style="list-style-type: none">• Increase the confidence in our plans for long-term investment to reduce the risk of internal and external hydraulic sewer flooding and enable catchment-level planning of surface water management solutions• Provide sewer network improvements by installing larger sewers• Construct deep tanks and tunnels to store combined sewage• Implement property level protection measures	<div>We will:</div> <ul style="list-style-type: none">• Further develop our catchment-level planning to reduce the risk of hydraulic sewer flooding by removing rainfall runoff that is entering our foul sewer system and enhance our surface water sewerage systems• Continue to provide sewer network improvements by installing larger sewers• Continue to construct deep tanks and tunnels to store combined sewage• Invest in our sewage treatment works to ensure compliance	<div>We will:</div> <ul style="list-style-type: none">• Reduce the risk of hydraulic sewer flooding by removing surface water from our foul sewer systems through the implementation of large-scale surface water management strategies• Continue to provide sewer network improvements by installing larger sewers• Continue to construct deep tanks and tunnels to store combined sewage• Disconnect existing surface water systems from combined sewers and discharge to watercourse• Provide additional storage at our sewage treatment works• Continue to invest in our sewage treatment works to ensure compliance	

Risk Zone 2 - Royal Borough of Kensington and Chelsea

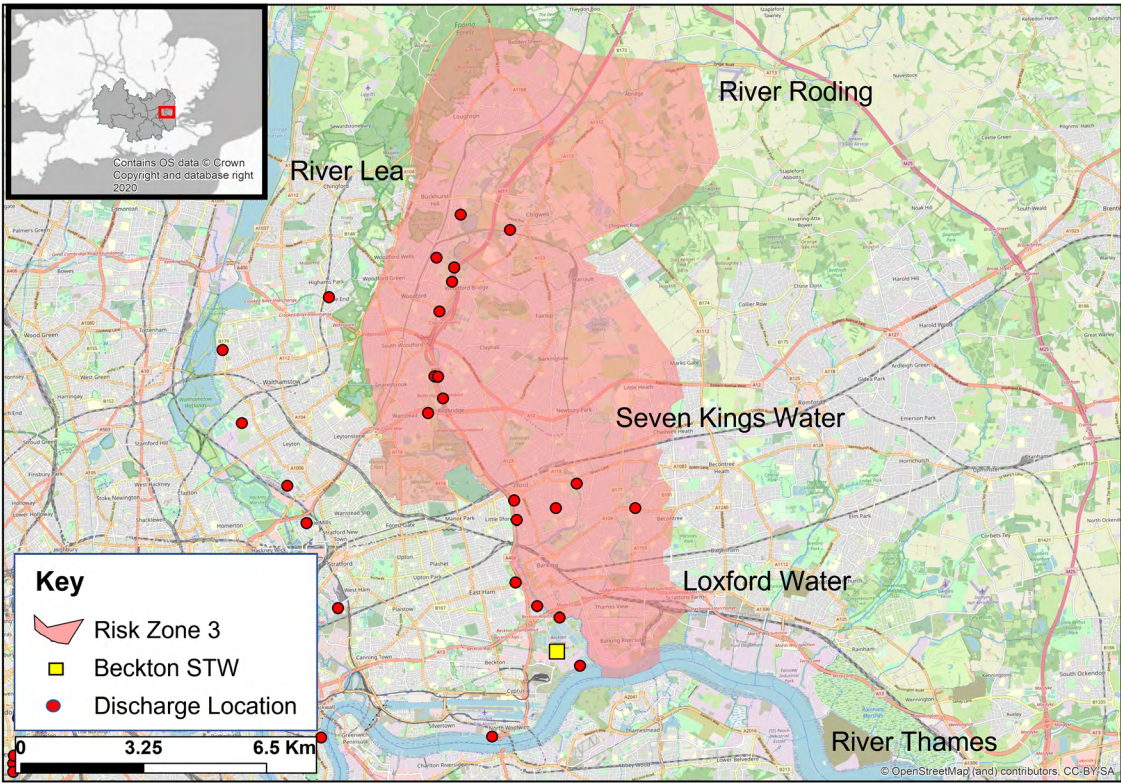
What are the challenges?	<ul style="list-style-type: none"> Increased internal sewer flooding - from 2.2% to 2.7% of properties: Calculated as increased modelled risk of internal hydraulic sewer flooding from 2.2% of properties (8742) at risk up to a 1 in 30-year storm in 2025 to 2.7% of properties (10698) at risk by 2050 Increased hydraulic sewer flooding - from 7.0% to 7.4% of properties: Calculated as increased modelled risk of internal hydraulic sewer flooding from 7.0% of properties (27809) at risk up to a 1 in 50-year storm in 2025 to 7.4% of properties (29448) at risk by 2050 The fourteen overflows in this area discharged 261 times in 2021
Which of our solutions are best suited?	<ul style="list-style-type: none"> Surface water management Network improvements Construct deep tanks and tunnels Property level protection measures to prevent individual buildings from hydraulic sewer flooding



<div>2025<div>← Short term →</div>2030<div>← Medium Term →</div>2035<div>← Long Term →</div>2050</div>				
Timescale				
What targets are we seeking?	<div>To:</div> <ul style="list-style-type: none">• Reduce property hydraulic sewer flooding to 1.5 % (internal) and 3 % (external) for rainfall up to a 1 in 30-year storm event in any given year• Reduce storm discharges (where overflows are present) to <10 in an average year by 2050			
How will we achieve the targets?	<div>We will:</div> <ul style="list-style-type: none">• Increase the confidence in our plans for long-term investment to reduce the risk of internal and external hydraulic sewer flooding and enable catchment-level planning of surface water management solutions• Provide sewer network improvements by installing larger sewers to increase network capacity• Implement property level protection measures to prevent individual buildings from hydraulic sewer flooding	<div>We will:</div> <ul style="list-style-type: none">• Further develop our catchment-level planning and implement surface water management solutions to reduce the risk of hydraulic sewer flooding by removing rainfall runoff that is entering our foul sewer system and enhance our surface water sewerage systems• Continue to provide sewer network improvements by installing larger sewers to increase network capacity• Construct deep tanks and tunnels to store combined sewage	<div>We will:</div> <ul style="list-style-type: none">• Continue to reduce the risk of hydraulic sewer flooding by removing surface water from our foul sewer systems through the implementation of surface water management solutions• Continue to provide sewer network improvements by installing larger sewers to increase network capacity• Continue to construct deep tanks and tunnels to store combined sewage	

Risk Zone 3 - Redbridge

What are the challenges?	<ul style="list-style-type: none">Increased internal hydraulic sewer flooding - from 1.0 % to 1.1 % of properties: Calculated as increased modelled risk of internal hydraulic sewer flooding from 1.0 % of properties (1970) at risk up to a 1 in 30-year storm in 2025 to 1.1 % of properties (2167) at risk by 2050Increased external hydraulic sewer flooding - from 0.1 % to 0.1 % of properties: Calculated as increased modelled risk of external hydraulic sewer flooding from 0.1 % of properties (189) at risk up to a 1 in 30-year storm in 2025 to 0.1 % of properties (257) at risk by 2050Increased hydraulic sewer flooding - from 1.3 % to 1.5 % of properties: Calculated as increased modelled risk of internal hydraulic sewer flooding from 1.3 % of properties (2596) at risk up to a 1 in 50-year storm in 2025 to 1.5 % of properties (2879) at risk by 2050The eighteen overflows in this area discharged 452 times in 2021
Which of our solutions are best suited?	<ul style="list-style-type: none">Large-scale surface water managementNetwork improvementsConstruct deep tanks and tunnels



<div>2025<div>← Short term →</div>2030<div>← Medium Term →</div>2035<div>← Long Term →</div>2050</div>				
Timescale				
What targets are we seeking?	<div>To:</div> <ul style="list-style-type: none">• Reduce property hydraulic sewer flooding to 1.5 % (internal) and 3 % (external) for rainfall up to a 1 in 30-year storm event in any given year• Reduce storm discharges (where overflows are present) to <10 in an average year by 2050			
How will we achieve the targets?	<div>We will:</div> <ul style="list-style-type: none">• Increase the confidence in our plans for long-term investment to reduce the risk of internal and external hydraulic sewer flooding and enable catchment-level planning of surface water management solutions• Provide sewer network improvements by installing larger sewers to increase network capacity• Construct deep tanks and tunnels to store combined sewage	<div>We will:</div> <ul style="list-style-type: none">• Further develop our catchment-level planning to reduce the risk of hydraulic sewer flooding by removing rainfall runoff that is entering our foul sewer system and enhance our surface water sewerage systems• Continue to provide sewer network improvements by installing larger sewers to increase network capacity• Continue to construct deep tanks and tunnels to store combined sewage	<div>We will:</div> <ul style="list-style-type: none">• Reduce the risk of hydraulic sewer flooding by removing surface water from our foul sewer systems through the implementation of large-scale surface water management strategies• Continue to provide sewer network improvements by installing larger sewers to increase network capacity• Continue to construct deep tanks and tunnels to store combined sewage	

Risk zone summary table

	2025 modelled baseline no. (% of properties)					2050 Performance without DWMP no. (% of properties)					2050 Performance with DWMP no. (% of properties)				Preferred solutions			
Risk Zones	Internal flooding (2025)	External flooding (2025)	Resilience flooding (2025)	Number of monitored storm overflows (2021)	Recorded (EDM) storm overflow discharges in 2021	Internal flooding (2050)	External flooding (2050)	Resilience flooding (2050)	Number of modelled storm overflows (2050)	Modelled average annual storm discharges (2050)	Internal flooding (2050) DWMP	External flooding (2050) DWMP	Resilience flooding (2050) DWMP	Modelled average annual storm discharges (2050) DWMP	2025-2030	2030-2035	2035-2050	Investment Band (£)
Beckton RZ1	6007 (1.2%)	15128 (3.1%)	28003 (5.7%)	20	431	6373 (1.3%)	13449 (2.8%)	25384 (5.2%)	27	226	5089 (1%)	11611 (2.4%)	21166 (4.3%)	<=10	CP, DT, IPP, NI	CP, DT, NI, STW	DSW, DT, LSSWM, NI, STR, STW	High
Beckton RZ2	8742 (2.2%)	12722 (3.2%)	27809 (7%)	14	261	10698 (2.7%)	12423 (3.1%)	29448 (7.4%)	17	88	3979 (1%)	6106 (1.5%)	12884 (3.2%)	<=10	CP, IPP, NI	CP, DT, NI, SWM	DT, NI, SWM	High
Beckton RZ3	1970 (1%)	189 (0.1%)	2596 (1.3%)	18	452	2167 (1.1%)	257 (0.1%)	2879 (1.5%)	46	626	2190 (1.1%)	212 (0.1%)	2774 (1.4%)	<=10	CP, DT, NI	CP, DT, NI	DT, LSSWM, NI	High
Beckton RZ4	369 (0.2%)	855 (0.5%)	2686 (1.5%)	10	189	91 (0.1%)	265 (0.1%)	435 (0.2%)	10	43	83 (0%)	265 (0.1%)	427 (0.2%)	<=10	CP, IPP	CP, DT, NI	DT, NI	Medium
Beckton RZ5	367 (0.2%)	638 (0.3%)	1740 (0.9%)	5	146	0 (0%)	15 (0%)	79 (0%)	7	20	0 (0%)	15 (0%)	78 (0%)	<=10	CP, IPP	CP, DT, NI	DT	Medium
Beckton RZ6	1615 (0.7%)	2851 (1.3%)	6725 (3%)	1	3	1458 (0.7%)	1230 (0.6%)	3618 (1.6%)	2	22	1441 (0.6%)	1223 (0.5%)	3594 (1.6%)	<=10	CP, IPP, NI	CP, DT, NI	DT	Medium

Note: We will achieve our London-wide flood reduction targets. However, there are a number of risk zones where this is not possible that are offset by other zones where the risks are reduced below the target.

CP = Catchment -
level planning
including mapping
and modelling

SWM = Surface
water management

NI = Network
improvements

LSSWM = Large-
scale surface water
management

STW = Treatment
process
technologies and
protection from
high river levels

IPP = Individual
property level
protection

STR = Additional
storage at sewage
treatment works

DT = Deep tanks
and tunnels

DSW = Disconnect
existing surface
water systems from
combined sewers
and discharge
to watercourse

Navigation index

We’ve developed a comprehensive document suite to share our final DWMP. This includes five summary documents, that contain increasing levels of detail, as well as Catchment Strategic Plans. To help you to navigate around our document suite and to find key DWMP content, we provide a navigation index below.

Navigation index		Protecting the environment and providing a reliable, sustainable wastewater service						Best value and delivery					Working together		DWMP stages and data					
		Storm overflows	Sewer flooding	Level of ambition & pace of delivery	Growth & climate change	Resilience: flooding & power	Groundwater	Environmental assessments	Affordability & bill impact	Best Value	Base vs Enhancement	Solutions & deliverability	Programme alignment	Partnership working	Stakeholder & customer engagement	DWMP stages & process	Level 2 regional summaries	Level 3 regional summaries	Data tables	Risk & Assurance
Summary documents	Customer summary																			
	Non-technical summary																			
	Technical summary																			
	The Plan																			
	Catchment Strategic Plans x13																			
Technical appendices x11	Appendix A - Strategic context																			
	Appendix B - Risk-Based catchment screening																			
	Appendix C - Baseline risk and Vulnerability assessment																			
	Appendix D - Options development and appraisal																			
	Appendix E - Programme appraisal																			
	Appendix F - Stakeholder engagement																			
	Appendix G - Adaptive pathway planning																			
	Appendix H – Customer engagement Part A – Draft DWMP																			
	Appendix I - Risk and uncertainty																			
	Appendix J - DWMP and WRMP alignment																			
Appendix M - Assurance																				
New technical appendices x9	Appendix N - You Said, We Did (YSWD)																			
	Appendix O - What base buys																			
	Appendix P - Response to July 2021 Floods																			
	Appendix Q - Storm overflows																			
	Appendix R - Delivery of SuDS and nature-based solutions																			
	Appendix S - Partnership opportunities and working																			
	Appendix T - Groundwater quality																			
	Appendix U - Resilience																			
	Appendix V – Customer engagement Part B – Consultation Survey Report																			
Environmental assessments	Appendix K - Strategic environmental assessment (SEA)																			
	Appendix L - Habitats regulations assessment (HRA)																			
Portals and data	Customer portal																			
	Practitioner portal																			
	Data tables																			
	Data tables commentary																			



Work with us

We want to continue to draw on your expertise and local knowledge and invite you to work further with us to meet the future needs of drainage and wastewater services in our region.

Please get in touch with us or provide feedback on this document by emailing our DWMP team at DWMP@thameswater.co.uk

For more information on our DWMP work or to share your views, please visit the DWMP portal on our website [here](#).