

Catchment Strategic Plan

Part of our Drainage and Wastewater Management Plan (DWMP)



Co-creating resilient wastewater catchments

A long-term Strategic Plan for the **Mogden** 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.

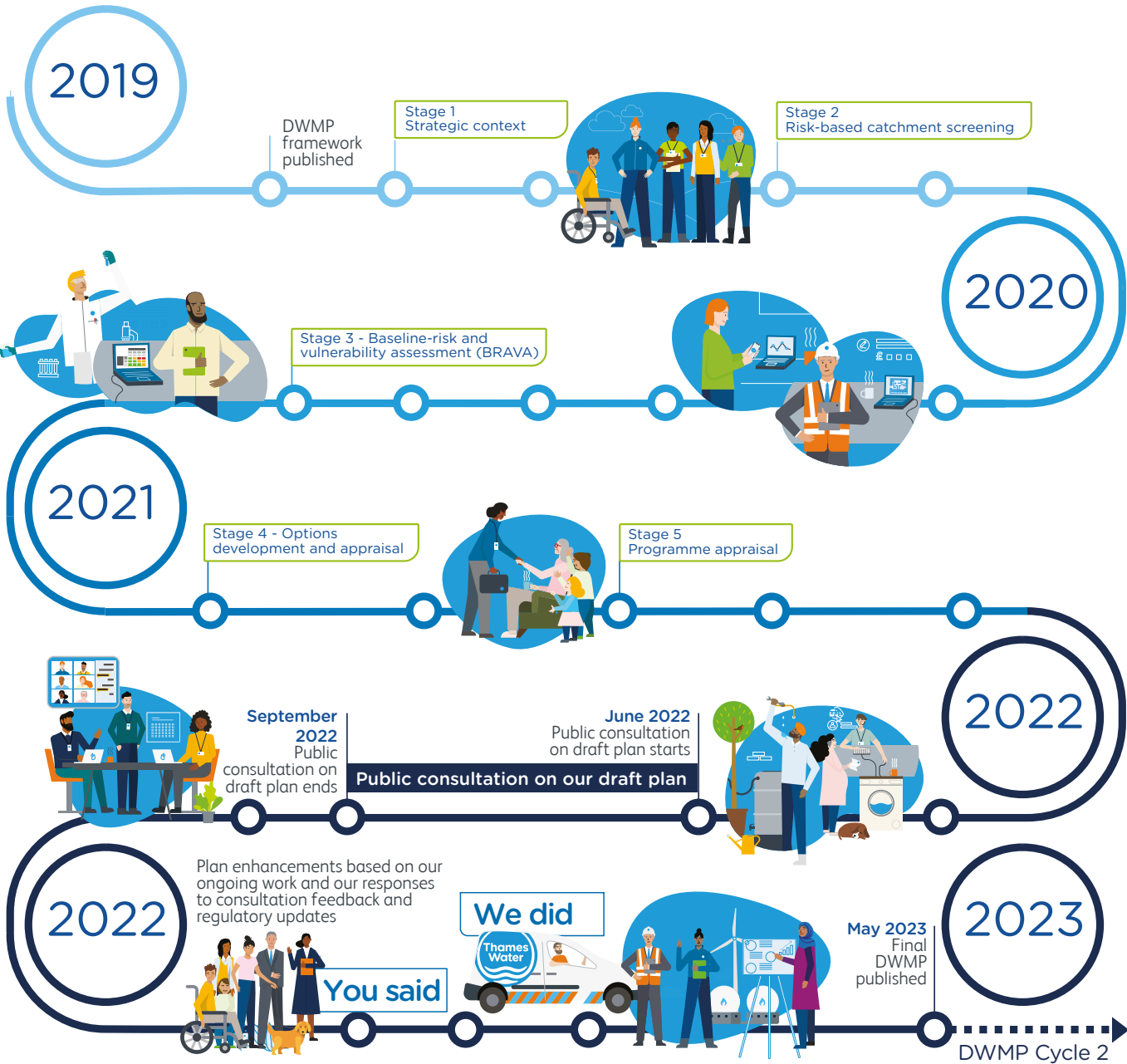
Our plan aligns with wider industry strategic plans and delivery programmes, such as the Water Industry National Environment Programme (WINEP) and the Long-Term Delivery Strategy (LTDS), and we'll make sure it continues to do so as we tackle current pressures and future challenges.

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.

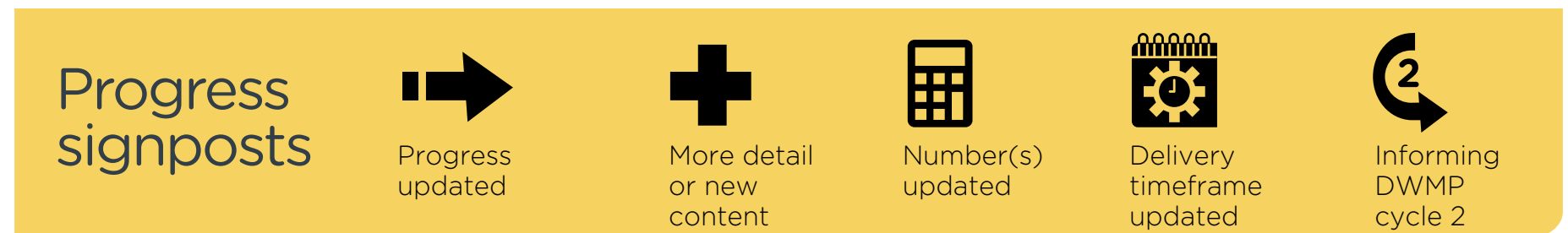
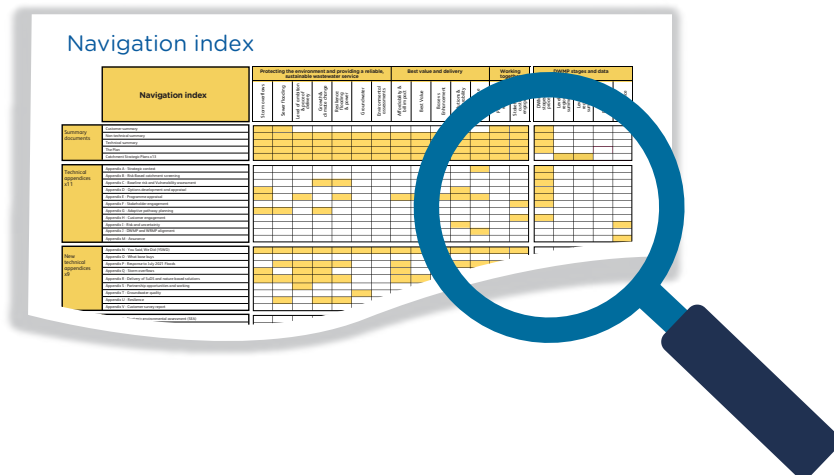
Preface

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.

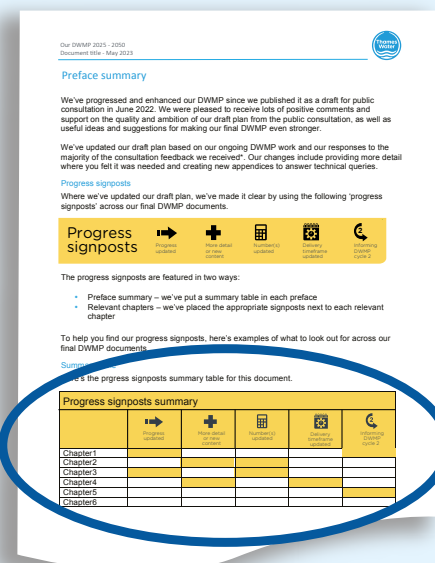
You can spot all the places we've updated our draft plan with our 'progress signposts', which we've used across all our final DWMP documents. Here's where they'll be:

- 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 Mogden system that covers the London boroughs of Hounslow, Ealing, Harrow, Hillingdon, Richmond upon Thames and Brent, and some parts of Surrey. 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](#)

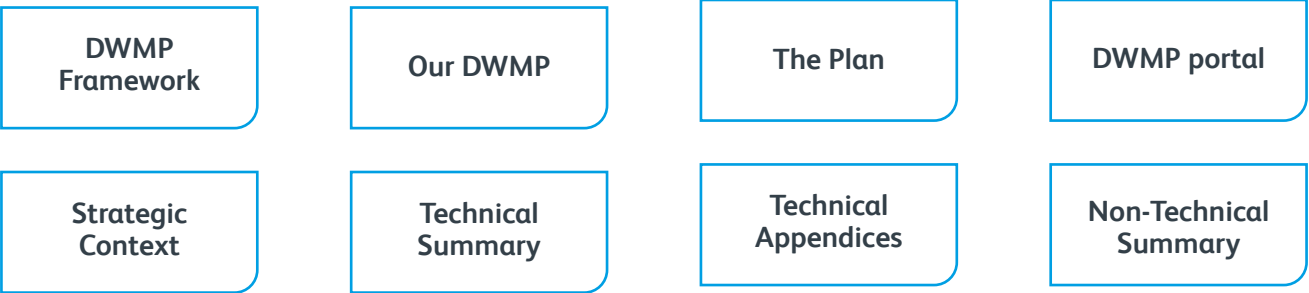
Our Goals

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 Mogden sewage treatment works to ensure 100% permit compliance and protect river water quality

Our DWMP components



Links to the components of our DWMP

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 flow 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 (classified 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 Mogden system

The Mogden system serves around 2.1 million people across a 155 km² catchment area of North and West London. Some of the wastewater in this system has travelled 30 km prior to treatment at Mogden STW.

The Mogden system has over 7,500 km of sewer network and 366 pumping stations. This is a conventional gravity system with a trunk sewer network and many assets are over 100 years old. Mogden STW is a strategic sludge centre in West London; in addition to treating its own sludge, the works was upgraded so that it can accept imported sludge from neighbouring sludge centres if they require support.

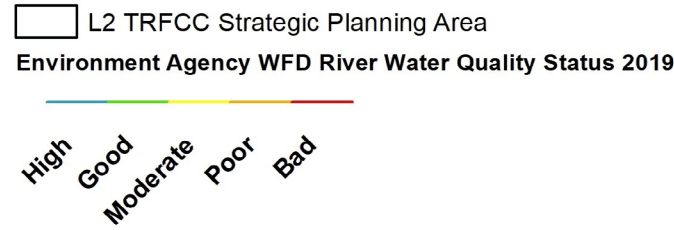
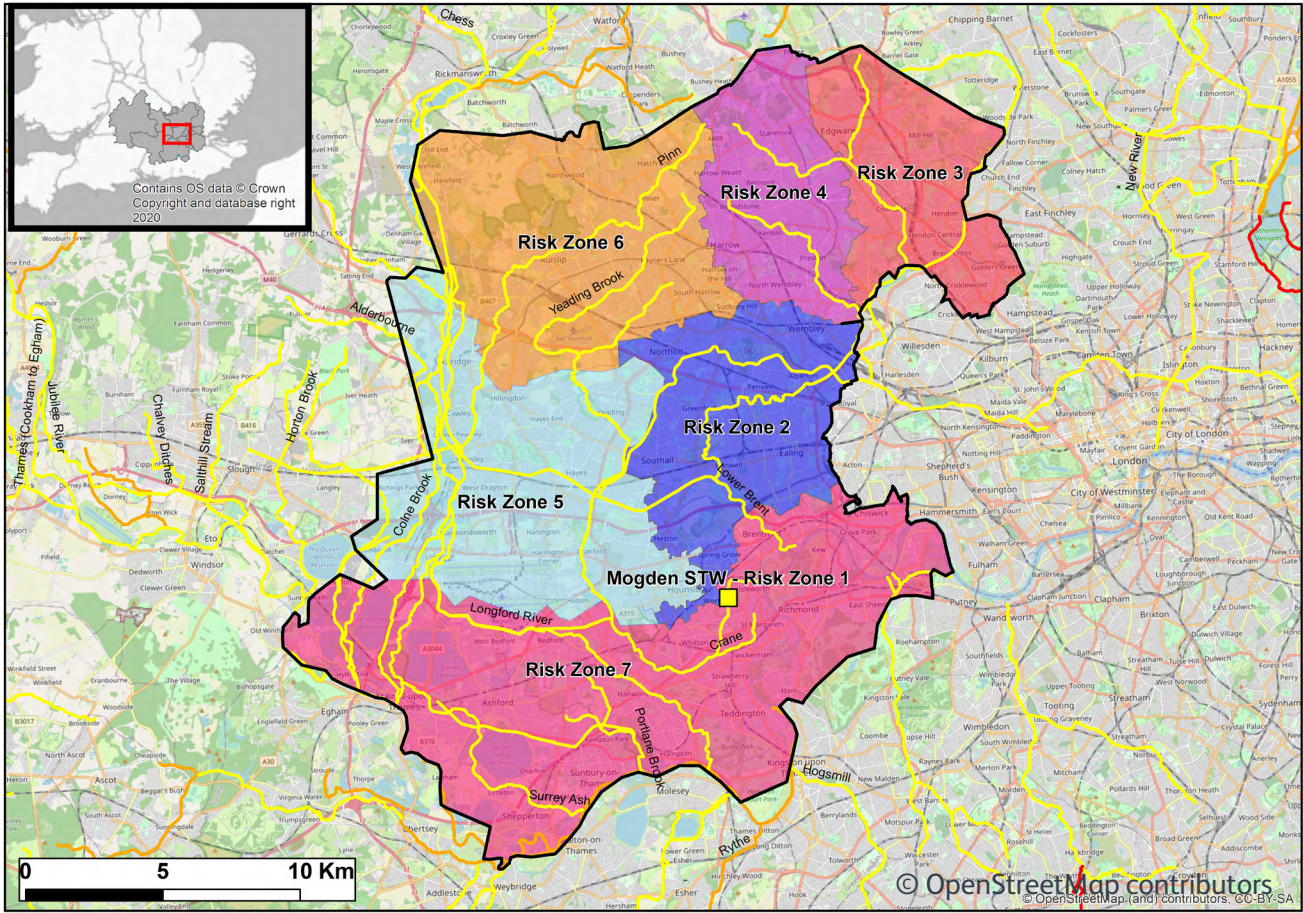
The Mogden catchment covers large parts of West London. Mogden STW is fed via three major sewers; the Bath Road High Level sewer that arrives from the north-western corner of the site, the Chiswick Low Level sewer, and the Western Low-Level sewer that arrives from the South.

The Mogden catchment drains to Mogden STW which is Thames Water’s third largest treatment works. It was built between 1931 and 1935 and covers an area of 55 ha.

The system also includes parts of the River Crane urban lowland catchments that extends for 125 km² and is a trial Smarter Water Catchment plan location. We are working with the Crane Valley Partnership to investigate and test catchment based opportunities in headwaters, floodplains, rural communities and urban communities. For further details please see [Co-creating a long-term plan for the River Crane catchment](#).

The region overview map below highlights the watercourses in this area that are typically heavily modified and have river water quality status as moderate.

The map also shows the sub-division of the Mogden system into seven risk zones. The risk zones allow the DWMP process to be applied and tailored to smaller discrete 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:

Environment Agency, Natural England, National Highways, Department for Environment, Food and Rural Affairs (Defra), Consumer Council for Water, Thames Water Customer Challenge Group (CCG), Thames21, Thames Rivers Trust, Barnet Council, Harrow Council, Hillingdon Council, Brent Council, London Borough of Ealing, London Borough of Hounslow, London Borough of Richmond upon Thames, Surrey County Council, Crane Valley Catchment Partnership, Colne Catchment Partnership, Brent Catchment Partnership, Greater London Authority and Transport for London.









Thames Water Customer Challenge Group (CCG)

Colne Catchment Partnership

Brent Catchment Partnership

Crane Valley Catchment Partnership

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.

“We fully support this project that will work towards our shared vision for a well-managed and high-quality protected river corridor providing habitat for wildlife and amenity for people”

“It's good that there is such a focus on SuDS given that replicating the foul or combined system would be too expensive and wouldn't deliver the DWMP's target, quantifiable benefit”



Partners' policies

Management Plan (Hyperlink)	Key aspects that align with the DWMP
Sustainability and Planning	
The London Plan	<ul style="list-style-type: none"> This plan is an integrated economic, environmental, transport and social framework for the development of London over the next 20-25 years.
Local Flood Risk Management Strategies	
London Borough of Barnet, Local Flood Risk Management Strategy	<ul style="list-style-type: none"> The report outlines the preferred surface water management strategy for the borough and for the part of the contributing hydrological catchment that lies within Mogden.
Brent, Flood Risk Management Strategy	<ul style="list-style-type: none"> This plan aims to identify sustainable responses to manage surface water flooding.
Harrow Council, Local Flood Risk Management Strategy	<ul style="list-style-type: none"> The plan aims to identify sustainable responses to manage surface water flooding and prepare action plans for the areas concerned.
Hillingdon, Local Flood Risk Management Strategy	<ul style="list-style-type: none"> The purpose of this plan is to identify sustainable responses to manage surface water flooding and prepare an action plan.
London Borough of Hounslow, Flood Risk Management Strategy	<ul style="list-style-type: none"> This strategy states what actions the council and other key stakeholders will take to manage potential flood risk in Hounslow.
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 through 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
London Borough of Richmond upon Thames, Local Flood Risk Management Strategy	<ul style="list-style-type: none"> The purpose of this strategy is to set out the approach to managing flood risk from local sources in both the short and long term.

Management Plan (Hyperlink)	Key aspects that align with the DWMP
Surrey Local Flood Risk Management Strategy	<ul style="list-style-type: none"> Making Surrey more resilient to flooding on a long-term basis through a coordinated approach with residents and partners Reducing the risk of flooding and its impact Supporting flood alleviation work where appropriate Investing in natural and engineered flood alleviation schemes, influencing policy and supporting residents Partnership working
Surface Water Management Plans	
Surface Water Management Plan, Volume 1&2. London Borough of Barnet Surface Water Management Plan, London Borough of Brent Surface Water Management Plan, London Borough of Harrow Surface Water Management Plan, London Borough of Hillingdon. Part 1 and 2	<ul style="list-style-type: none"> These plans outline preferred surface water management strategies and include consideration of flooding from sewers, drains, groundwater and runoff from land, small watercourses and ditches that occurs as a result of heavy rainfall.
Surface Water Management Plan, London Borough of Hounslow	<ul style="list-style-type: none"> The vision of this plan is that all watercourses flow year-round with plentiful, quality water that supports its characteristic flora and fauna. It outlines the preferred methodology for managing the risk of flooding from local flood sources at a given location or area.

Management Plan (Hyperlink)	Key aspects that align with the DWMP
Surface Water Management Plan, London Borough of Richmond Upon Thames	<ul style="list-style-type: none"> This plan enables the LLFA to carry out their responsibilities by proposing potential mitigation measures and an action plan to reduce flood risk in the area, as well as suggesting methods for working collaboratively with partners and stakeholders.
Surrey County Council, Surface Water Management Plans	<ul style="list-style-type: none"> This plan identifies where surface water issues are identified in a catchment area in order to list a plan of action to manage the risk of flooding from surface water.
River Catchment Partnership Plans	
Brent Catchment Partnership & Action Plan	<ul style="list-style-type: none"> Create a shared vision around SuDS for all involved in design and evaluation Enable the design and evaluation of SuDS to meet agreed standards Ensure SuDS are maintainable now and in the future
The Colne Catchment Action Network	<ul style="list-style-type: none"> Increase surface water management at source Improve knowledge and understanding of the catchment Increase public engagement and participation Improve wildlife corridors Improve water quality Work together
Maidenhead to Teddington Catchment Plan	<ul style="list-style-type: none"> The vision statement is 'A Healthy River Thames for all. Our vision is to protect, improve and enhance all rivers within the Lower Thames Catchment by 2027, making them cleaner, more accessible and more attractive, to benefit local communities and wildlife, both now and for the benefit of future generations.'
Crane Valley Partnership, Strategy for the Crane Catchment, 2018-2028	<ul style="list-style-type: none"> This strategy, which aligns with the DWMP, gives a clear vision for the Crane catchment and to guide the future development of the Crane Valley Partnership over the ten years to 2028.

Management Plan (Hyperlink)	Key aspects that align with the DWMP
Green/Blue Infrastructure Plans	
Colne and Crane Valleys, Green Infrastructure Strategy	<ul style="list-style-type: none"> This strategy has been prepared to address the significant and numerous challenges of the 21st century in the Colne and the Crane river catchments.
London Borough of Hounslow, Green and Blue Infrastructure Strategy	<ul style="list-style-type: none"> This strategy will help to support a Green Recovery in Hounslow by providing a vision and framework for Green and Blue Infrastructure developed in consultation with key stakeholders.
Barnet London Borough, Green Infrastructure	<ul style="list-style-type: none"> This document outlines the capacity of Green Infrastructure to deliver a wide range of benefits and how these might be promoted and delivered through existing policies and processes.
SUDs Design and Evaluation Guides	
Hillingdon SuDS Design and Evaluation Guide	<ul style="list-style-type: none"> This guide promotes the idea of integrating SuDS into the fabric of development using the available landscape spaces as well as the construction profile of buildings. This approach provides more interesting surroundings, cost benefits, and simplified future maintenance.
Surrey County Council, Sustainable Drainage System Design Guidance	<ul style="list-style-type: none"> This advice sets out the requirements that the LLFA has for drainage strategies and surface water management provisions associated with applications for development.
Local Plans	
River Crane Smarter Water Catchment Plan	<ul style="list-style-type: none"> This plan outlines the approach and sets out the actions which the Catchment Partnership will collectively deliver over a 10-year time period.
Lower River Crane Restoration, Feasibility and Options Appraisal	<ul style="list-style-type: none"> The aim of this report is to undertake a feasibility assessment and options appraisal of the initial concept vision developed by Astronaut Kawada. The report outlines more defined options, and spatially specific scenarios, along this theme.

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 7 of the 17 indicators being breached.

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

This identified the highest risk for each metric that then progressed through optioneering and into the appraisal phases. The table identifies the risk areas and metrics that have passed through for solution development.

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 to for opportunities to utilise future technologies and engineering solutions.

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

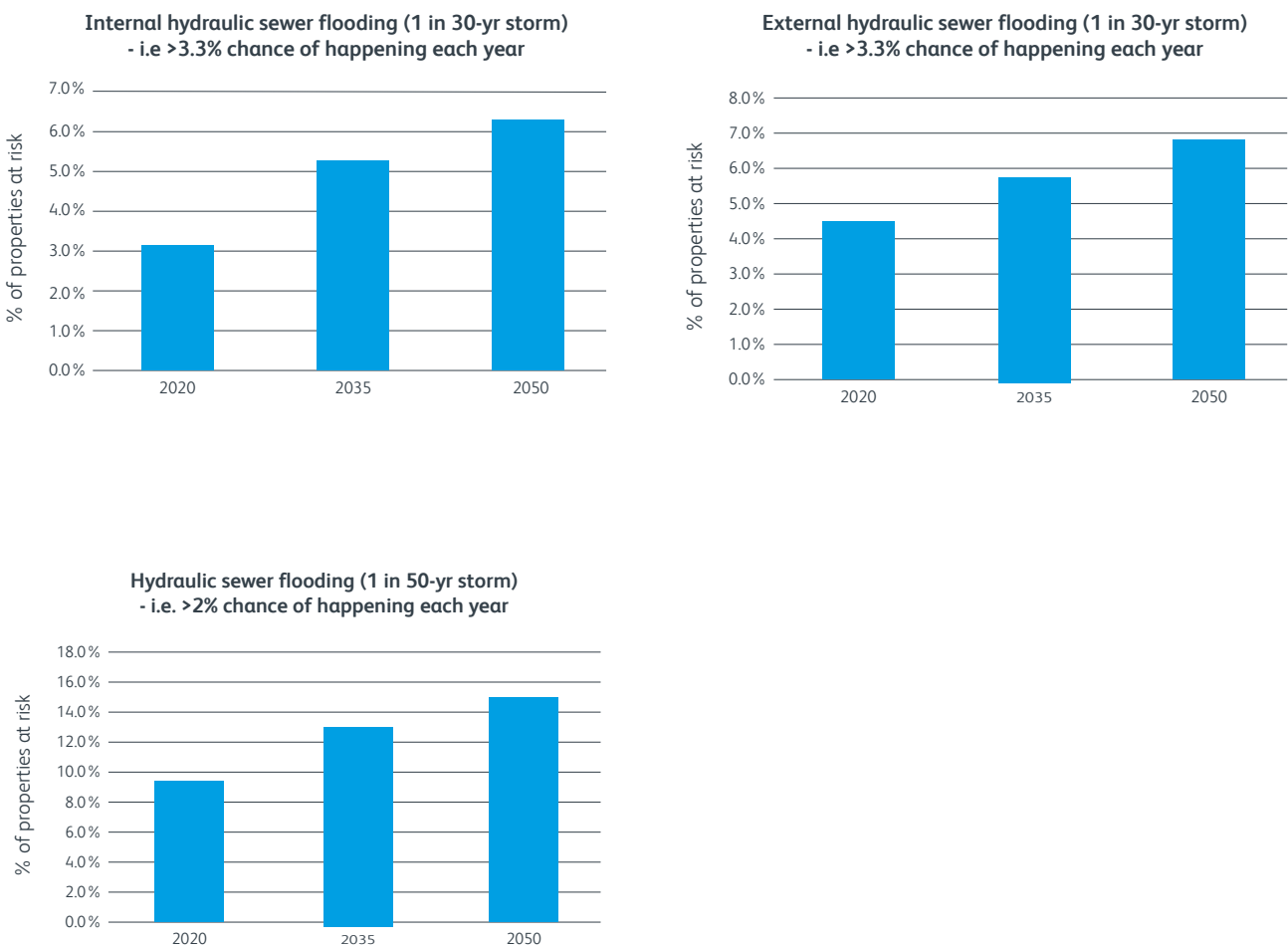
We've modelled the entire system against future challenges, assessed targets and carried out discussions with local stakeholders and forecast that, if we do nothing and do not implement the DWMP, over the next 25 years there will be an increased risk of flooding and pollution from our sewer systems.

We forecasted 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 to 2050. This has helped determine how risk will change over time due to these factors.

Our forecast network performance metrics are summarised opposite. By 2050 we forecast that, across the region, over 15 % of properties will be at risk of flooding internally from the sewer system in a 1 in 50-year storm.

Based on our findings from the modelling and carrying out discussions with local stakeholders we forecast that, if we do nothing, over the next 25 years there will be an increased risk of hydraulic flooding and pollution from our sewer systems in this region.

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



Mogden STW water quality and DWF compliance

	2020	2025	2030	2035	2040	2045	2050
Water Quality (SS* & BOD*)	78 %	93 %	95 %	98 %	100 %	103 %	107 %
Water Quality (AmmN*)	78 %	93 %	95 %	98 %	100 %	103 %	107 %
DWF	98 %	96 %	97 %	99 %	101 %	105 %	108 %

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

* Ammoniacal Nitrogen (AmmN)

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 above indicate that the DWF permit will be breached in 2040 and that water quality performance has started to breach the current Thames Water target of being less than 80 % of the permitted level and will breach the permit by 2040. An upgrade is currently in delivery.

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](#)

Sustainable solutions

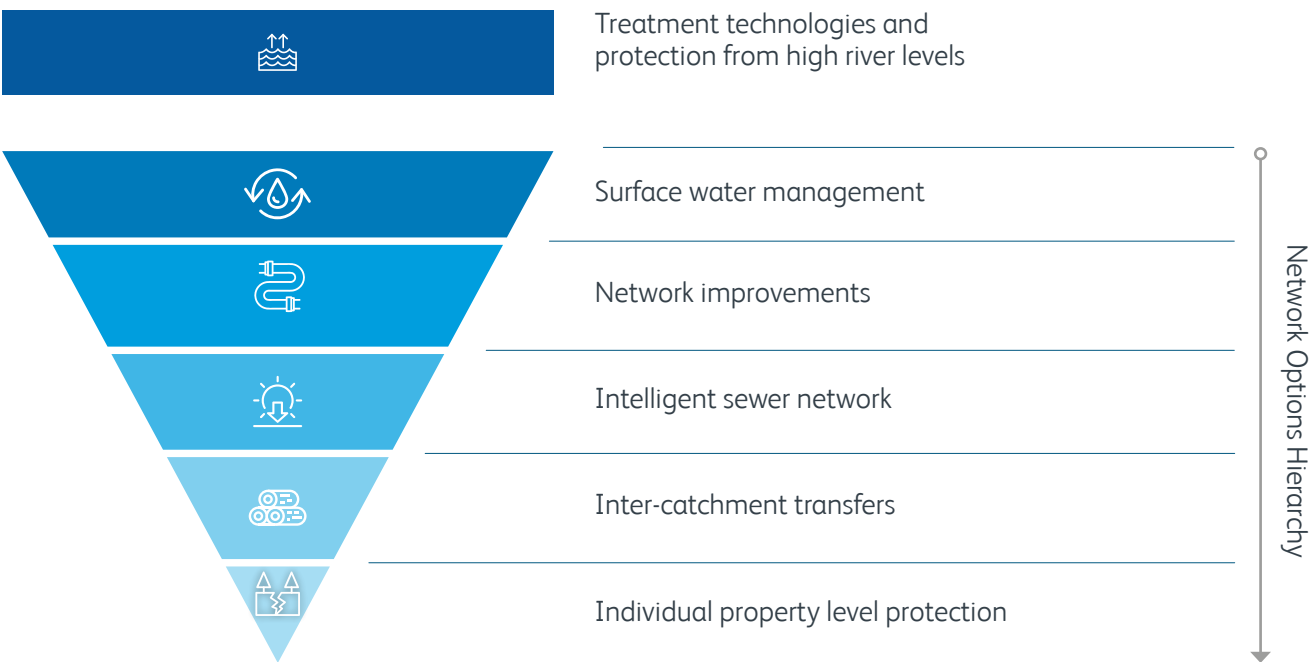
We’ve combined our knowledge of the catchments with the stakeholder feedback we’ve received to help us identify the solutions required to meet the future needs of this region. We’ve used a structured approach that started with over 40 generic solutions, to ensure broad thinking, and identified and assessed 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.

The rural/urban mix in this catchment aligns to balancing SuDS engineering solutions with traditional storage, predominantly in urban areas.

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 common 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>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>“Intelligent” sewer network</h3> <p>Active system management at key points in the network to optimise available network capacity by balancing network flows. e.g. automation of weir chambers on trunk sewers or the active system management of pumping stations, using sewer monitors for live/predictive modelling.</p>	<h3>Inter-catchment transfers</h3> <p>Utilise and optimise existing inter-catchment connections between the catchments and also between some of the STWs. These connections could be used to transfer flows between catchments without capacity to those with short-term capacity.</p>	<h3>Individual property level protection</h3> <p>Providing vulnerable homes with active and passive sewer 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.



Silk Stream Flood Resilience

Silk Stream is a unique catchment-wide project that can be delivered collaboratively. The project will test new techniques for identifying surface water influxes into the foul sewer and removing them for greater resilience to storm events.

There is an existing flood risk along the River Brent and the Silk Stream. This proposed work will help to find and remove surface water and identify ‘cold spots’ where blockages congeal and form, helping to better target sewer cleaning.

Catchment-wide interventions have been developed in partnership with Barnet & Harrow in their project submission Silk Stream Flood & Resilience Innovation (SSFRI).

The catchment-wide project is also proposing Natural Flood Management interventions and targeted SuDS with community at the heart of the project.

Thames Water have:

- funded and installed thermosensors in the foul sewers to understand if we can detect temperature changes that indicate surface flows entering the foul sewer
- Participated in their very extensive “Policy challenge” a requirement of all Defra innovation projects. It challenges issues like Schedule 3, Building Regs, Misconnection legal action with the EHO etc. TW have not yet seen the outputs
- supported on proposed SuDS projects (potential for a big SuDS feature in Watling Park)

Byron Recreation Ground

Proposals to utilise Byron Recreation Ground for flood water storage have been identified as part of the Wealdstone Brook Flood Alleviation Scheme. The proposals would reduce the severe flooding issues at the crossing of Kenmore Avenue and Daintry Close in Harrow.

Designs for Byron Recreational Ground aim to develop an area that avoids loss of current facilities such as football pitches and a cricket ground whilst also developing an area of habitat biodiversity through construction of a wetland. This opportunity potentially could add wider environmental and community benefits.

Beverley Brook catchment FCRIP

From early 2023, Richmond and Wandsworth’s new Flood and Coastal Resilience Innovation Programme (FCRIP) has continued to develop flood resilience in the Beverley Brook catchment area. In partnership with the Wildfowl & Wetlands Trust and Barnes Common Limited, development has continued to modernise flood risk management and increase community preparedness. Partnership working is focusing on solutions to flooding in an urban environment by restoring a more natural environment such as slowing the flow of water through the landscape.

The lead local flood authority will use that water to create more natural urban green and blue spaces that protects residents from severe flooding. Nature-based solutions include:

- creating filtration and attenuation wetlands
- reintroducing natural floodplain so they can store water from flooding safely
- making in-channel improvements
- implementing a SuDS programme
- using Natural Flood Management in locations such as local parks and highways



Opportunity	Partners
Silk Stream FCRIP	Barnet Council and Harrow Council
Roxbourne Park	London Borough (LB) of Harrow and Hillingdon Council
Joel Street Ditch	Hillingdon Council
Byron Recreation Ground Harrow	Harrow Council
Ruislip Manor Blue-Green Infrastructure	Hillingdon Council
Strawberry Vale	LB of Richmond upon Thames
Marlow Crescent	LB of Richmond upon Thames
Beverley Brook catchment FCRIP	LB of Richmond upon Thames, WWT and Barnes Common
Deculverting the Yielding Brook	Hillingdon 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 Mogden 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 to us in delivering that balance include:

- 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

- Pipe materials e.g. pitch fibre sewers impacting asset health
- Ownership and maintenance of SuDS

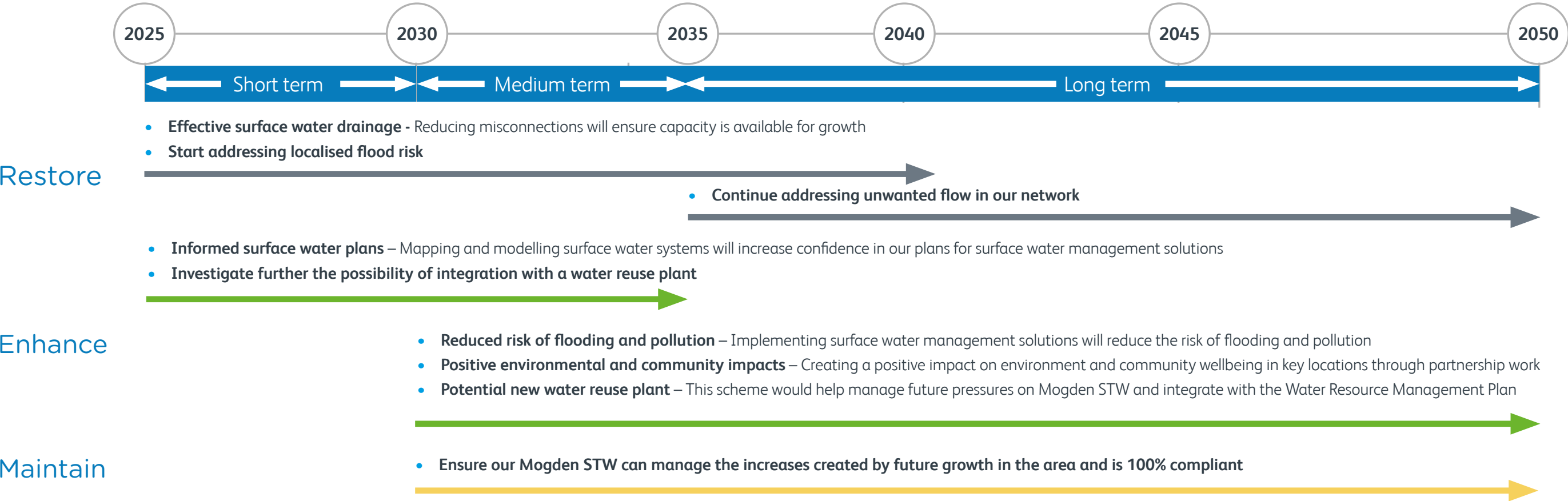
We propose a phased plan for this region which uses a combination of information gathering, optioneering and assessment of costs to evaluate the best value option for our customers to ensure resilience against climate change and future growth in this catchment.

We will ensure we continue to provide a drainage and wastewater service, but we will also ensure the service protects the natural habitat, environment and water quality of this unique area and supports the growth ambitions of its communities.

We will work to make our network less affected by high rainfall events. For example, where foul and surface water systems are combined, we will separate them to all but eliminate the influence of surface water and groundwater on the foul and combined sewerage systems. In the short term our focus will be on asset condition, but this goes beyond the maintenance we undertake across our network every day and reducing infiltration.

We will enhance mapping and modelling to consolidate our knowledge of areas of the network where investment is needed the most.

This will help us to develop strategic surface water management and network reinforcement solutions. Network improvements are likely to include increasing the storage by upsizing or attenuation tanks. The diagram below outlines the sequencing of our proposed interventions for this area:



Adaptive pathway planning at Mogden STW

Mogden is our third largest sewage treatment works and one of our most landlocked sites in London. 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 currently planned AMP7 upgrades will provide treatment capacity to a 2040 design horizon with improved plant efficiency and increased power generation

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:

- Upgrade and intensify the existing on-site treatment
- Off-site treatment

The drivers behind our different solutions:

- Rate of population growth
- Environmental concerns
- Regional requirements for additional water opportunities linked to potential future sludge (biosolids) investment

Future strategic options

Offsite WRMP Indirect Potable Reuse (IPR)

- An integrated solution to intercept the Mogden South sewer and pump the flow to a water reuse plant in Hydes Field
- Treated water will then be pumped into the River Thames upstream of the Walton Intake
- This option will not be required until at least 2035 subject to the Water Resource South East (WRSE) and Strategic Resource Option (SRO)

Offsite liquor treatment

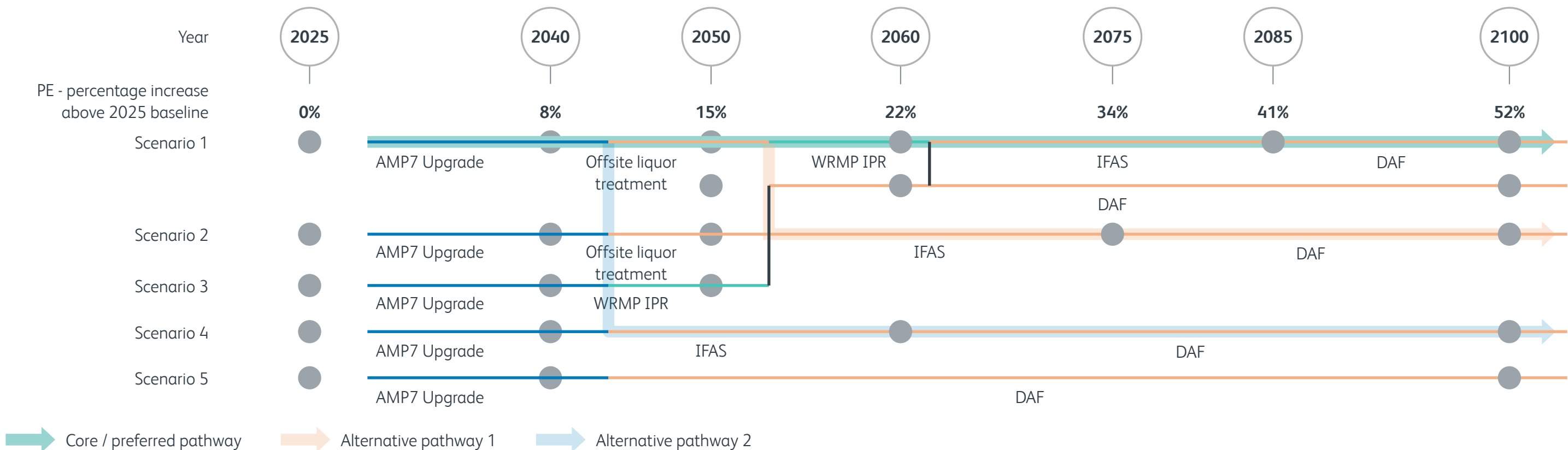
- Ammonia removal through treating digestion liquors at Iver South

On-site intensive waste treatment technologies Dissolved Air Flotation (DAF)

- Provide additional primary treatment capacity using DAF

Integrated Fixed film Activated Sludge plant (IFAS)

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



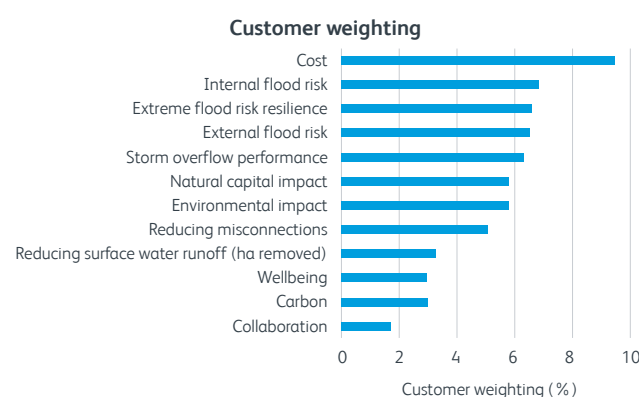
Developing our preferred plan for Mogden

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 with 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.



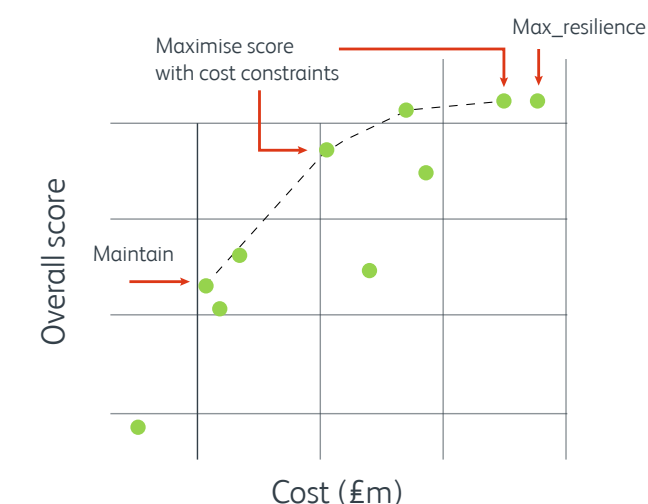
Reducing misconnections

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 Mogden

From the first iteration of our preferred plan for Mogden we estimate that to tackle growth and climate change, we need to invest an additional £5.7bn 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 catchment 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.

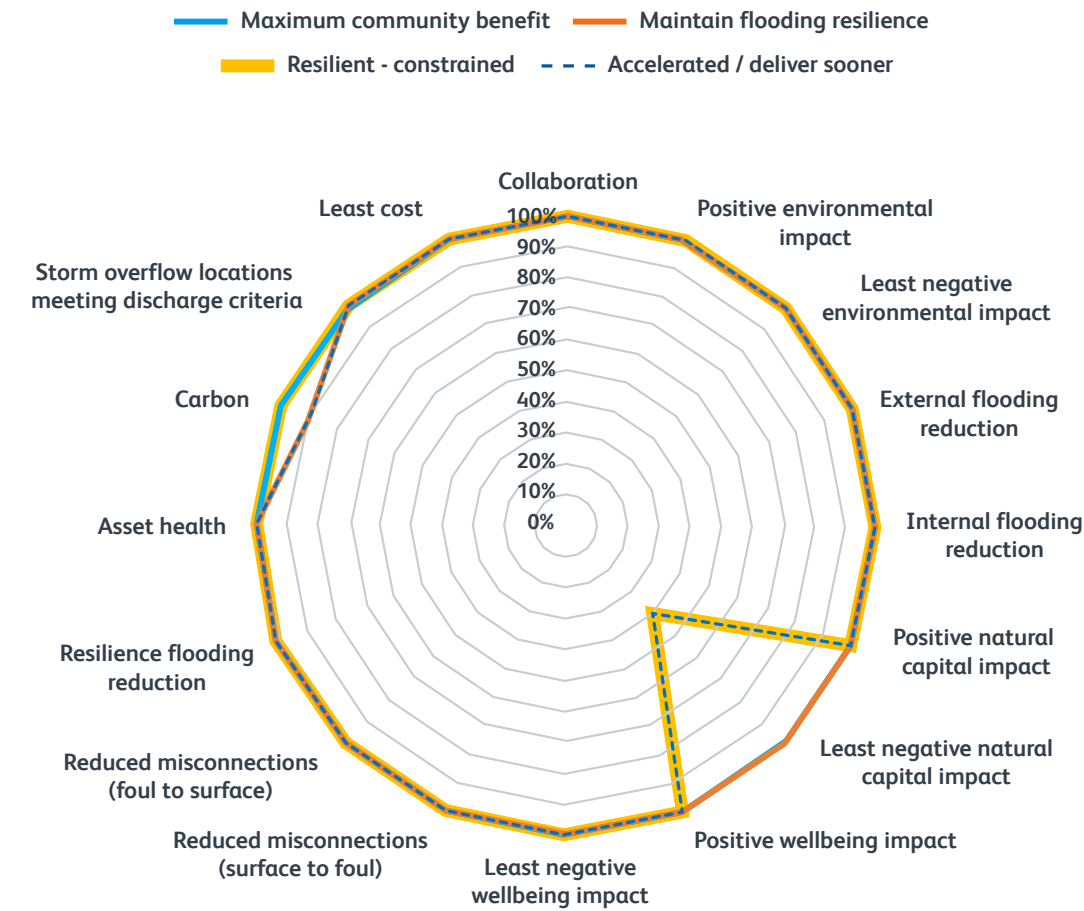
Our preferred plan comprises options that have been developed to meet medium term (2035) and long term (2050) performance targets.

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

- £2.80bn 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
- £2.75bn on improvements to surface water management, with a particular focus on removing surface water from impacting on the networks
- £93m upgrading the Mogden STW
- £51m for 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 722. By 2050, none of the 85 storm discharge locations in this catchment will overflow more than ten times per annum on average

Property flooding

Protect 14,991 properties from internal sewer flooding up to a 1 in 30-year storm event
Protect 12,078 properties from external sewer flooding up to a 1 in 30-year storm event
Protect 32,270 properties from sewer flooding up to a 1 in 50-year storm event
If we don't invest, over 13.2% of properties would be at risk in a storm up to 1 in 50-year in 2050. As a result of implementing our plan, this would decrease to 9.5%
Still supporting an overall goal of 95% of properties not at risk across London

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

Upgrade the Mogden STW by 2050

Reduce misconnections / Reduce surface water runoff

1885 ha (equivalent to 125,700 properties) to be disconnected from our sewers and reconnected to a surface water sewer with attenuation or to a soakway

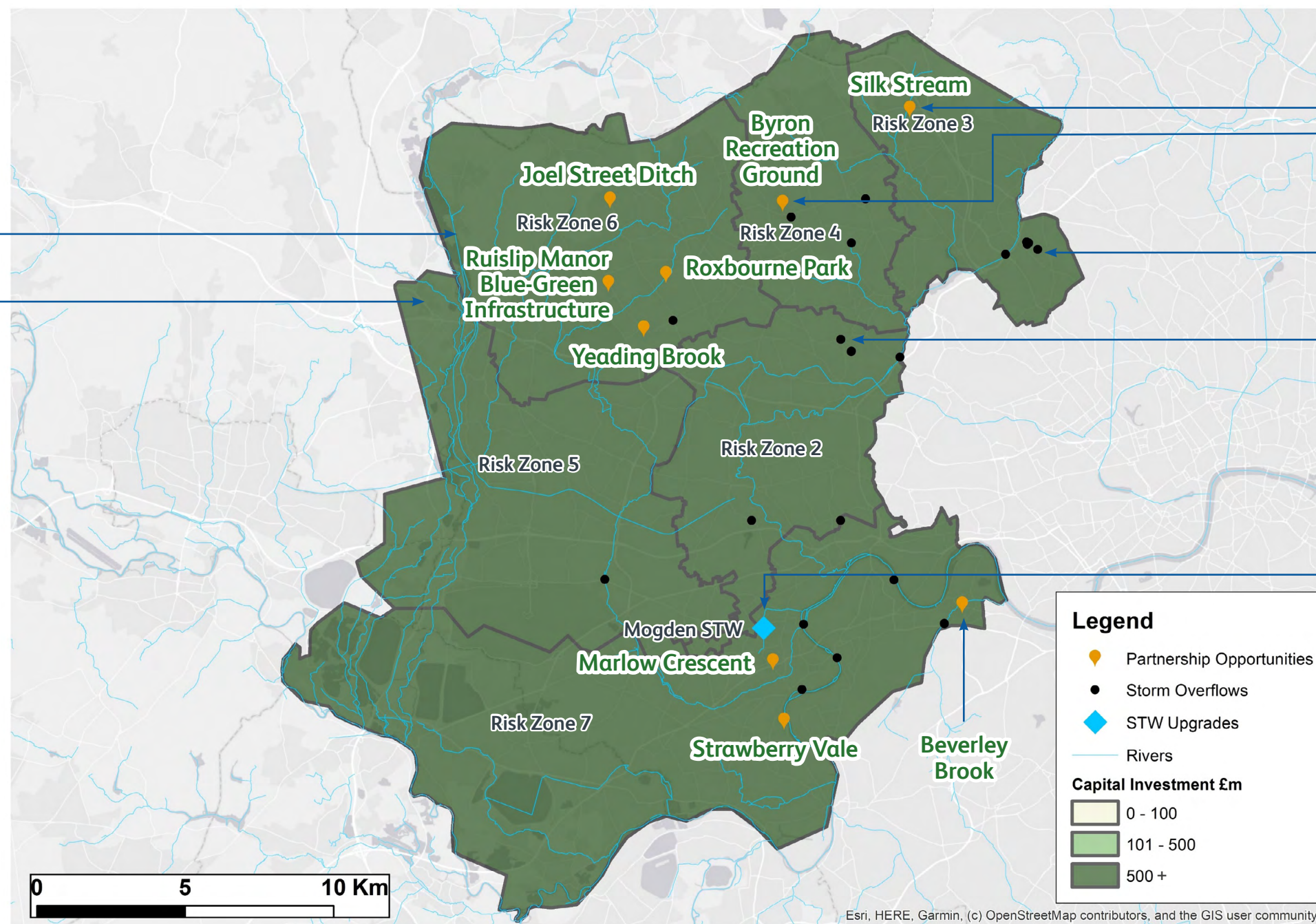
Carbon

717,382 tonnes of carbon embodied in delivering the plan, with 28,619 tonnes of carbon sequestered in delivering the plan



Our preferred 25 year plan for Mogden

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



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](#).

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.

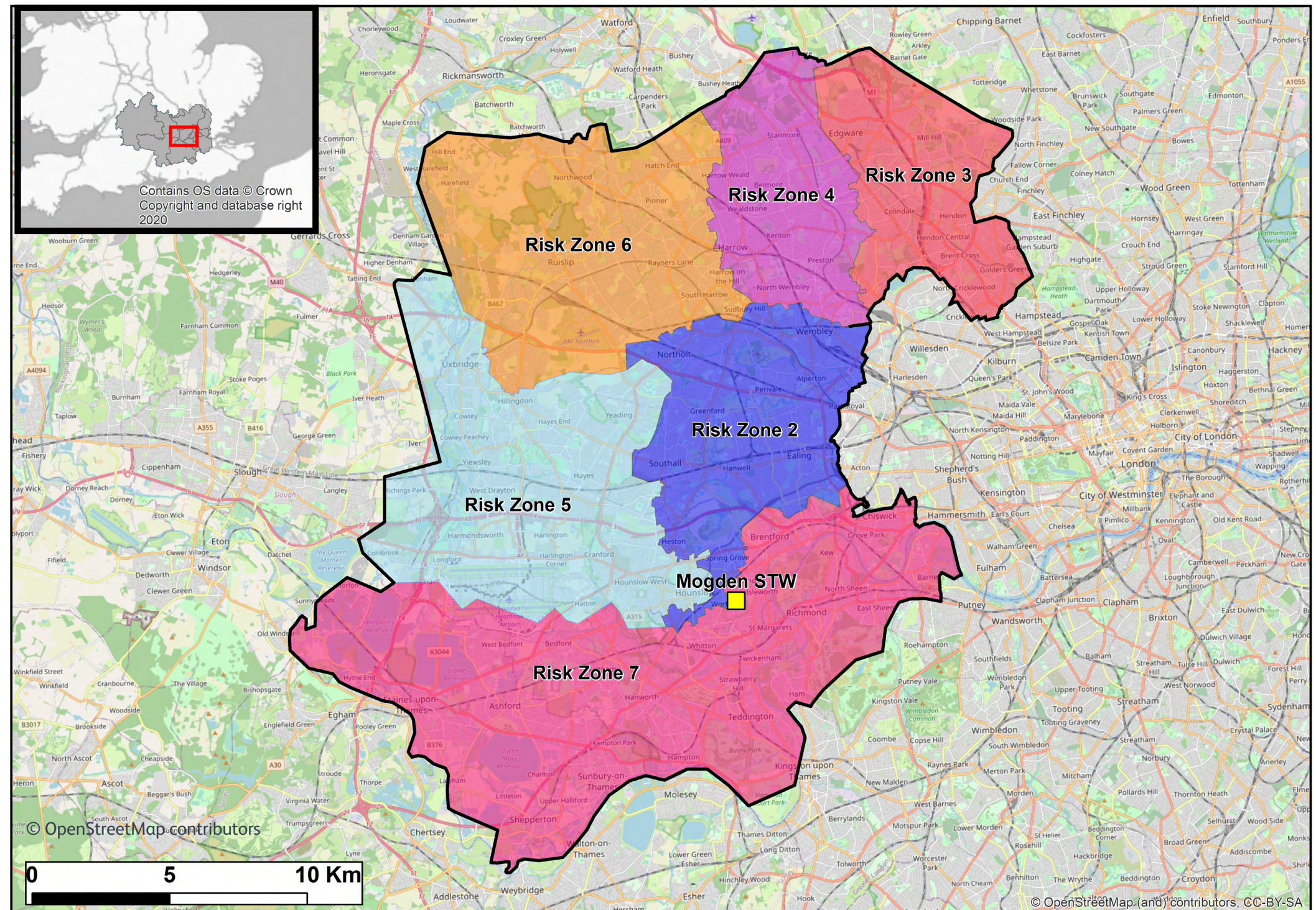
Funding and delivery

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.



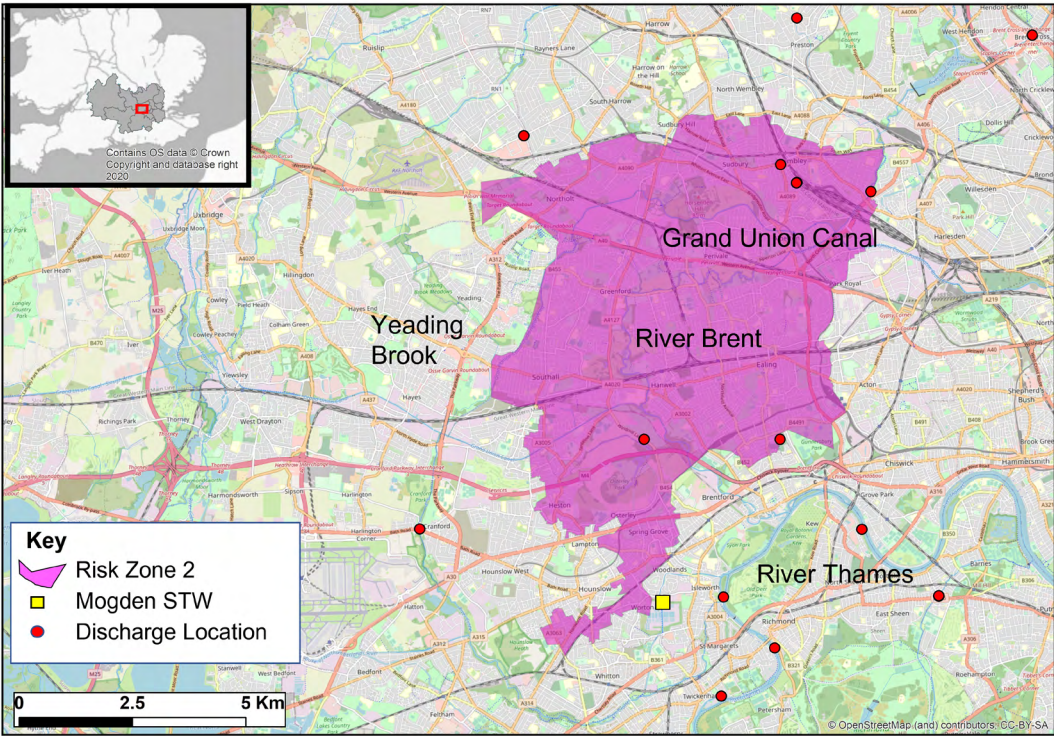
Our shared plan at catchment level

To find out more about our plans for the risk zones in this catchment, please use this interactive map by clicking on the blue boxes.



Risk Zone 2 – Central

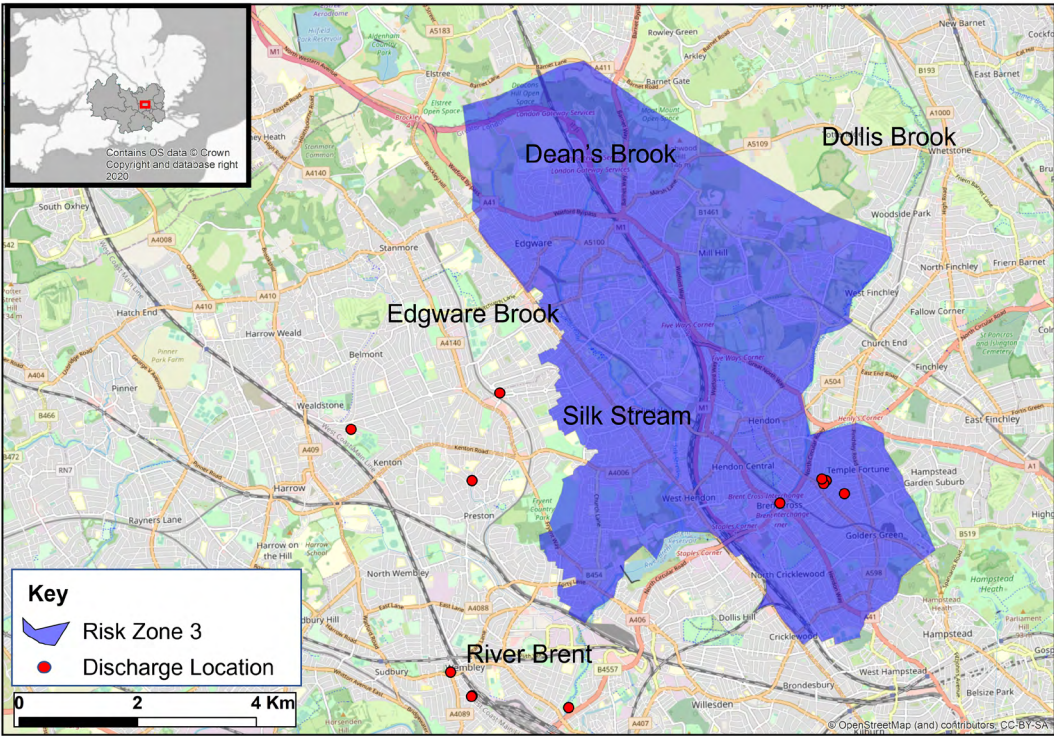
What are the challenges?	<ul style="list-style-type: none">Increased internal hydraulic sewer flooding – from 1.6 % to 3.5 % of properties: Calculated as increased modelled risk of internal hydraulic sewer flooding from 1.6 % of properties (2562) at risk up to a 1 in 30-year storm in 2025 to 3.5 % of properties (5746) at risk by 2050Increased external hydraulic sewer flooding - from 4.1 % to 6.9 % of properties: Calculated as increased modelled risk of external hydraulic sewer flooding from 4.1 % of properties (6628) at risk up to a 1 in 30-year storm in 2025 to 6.9 % of properties (11170) at risk by 2050Increased hydraulic sewer flooding - from 7.4 % to 13.6 % of properties: Calculated as increased modelled risk of internal hydraulic sewer flooding from 7.4 % of properties (12064) at risk up to a 1 in 50-year storm in 2025 to 13.6 % of properties (22041) at risk by 2050The eight overflows in this area discharged 45 times in 2021
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 tunnelsUse parks and urban spaces to store excess surface water



	2025	2030	2035	2050
Timescale	← Short term → ← Medium Term → ← Long Term →			
What targets are we seeking?	To: <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 yearReduce storm discharges (where overflows are present) to <10 in an average year by 2050			
How will we achieve the targets?	<div>We will:<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</div> <div>We will:<ul style="list-style-type: none">Further develop our catchment-level planning and implement large-scale surface water management strategies 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 systemsProvide sewer network improvements by installing larger sewers to increase network capacityConstruct deep tanks and tunnels to store combined sewage</div> <div>We will:<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 and large-scale surface water management strategiesContinue to provide sewer network improvements by installing larger sewersContinue to construct deep tanks and tunnels to store combined sewageUse parks and urban spaces to store excess surface water during rainfall events</div>			

Risk Zone 3 – North East

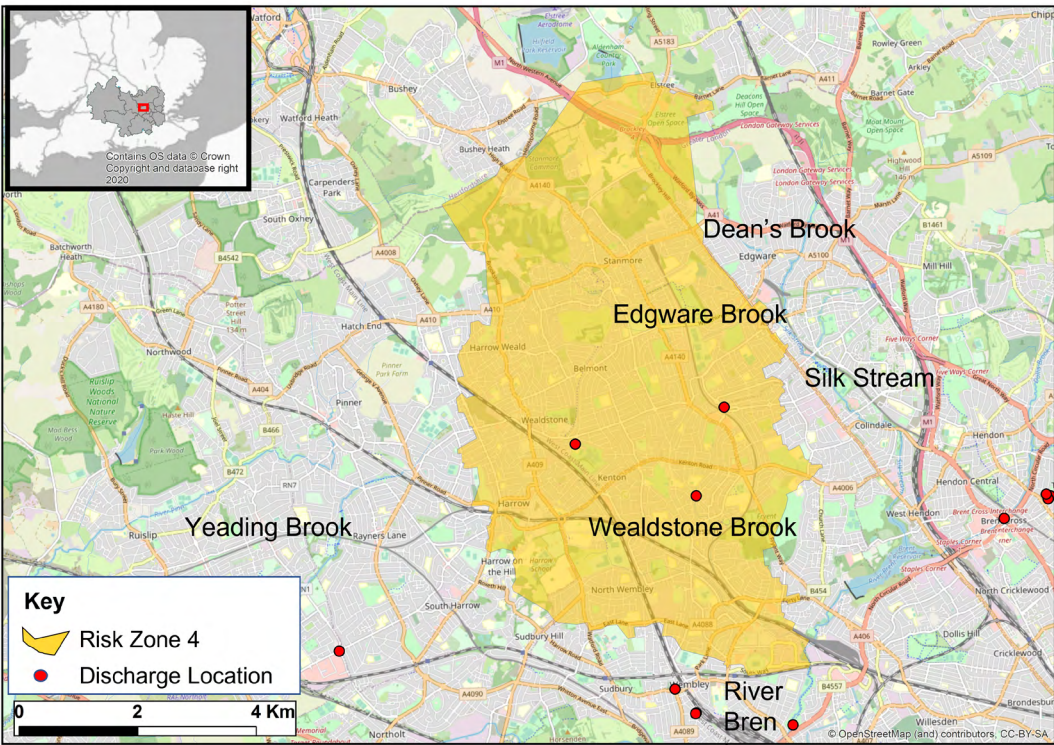
What are the challenges?	<ul style="list-style-type: none">Increased internal hydraulic sewer flooding - from 1.9 % to 3.6 % of properties: Calculated as increased modelled risk of internal hydraulic sewer flooding from 1.9 % of properties (2205) at risk up to a 1 in 30-year storm in 2025 to 3.6 % of properties (4126) at risk by 2050Increased external hydraulic sewer flooding - from 4.3 % to 6.3 % of properties: Calculated as increased modelled risk of external hydraulic sewer flooding from 4.3 % of properties (4992) at risk up to a 1 in 30-year storm in 2025 to 6.3 % of properties (7292) at risk by 2050Increased hydraulic sewer flooding - from 7.9 % to 12.1 % of properties: Calculated as increased modelled risk of internal hydraulic sewer flooding from 7.9 % of properties: (9059) at risk up to a 1 in 50-year storm in 2025 to 12.1 % of properties (13975) at risk by 2050The five overflows in this area discharged 65 times in 2021
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 tunnelsUse parks and urban spaces to store excess surface waterProperty-level protection measures to prevent individual buildings from sewer flooding



	2025	2030	2035	2050
Timescale	← Short term → Medium Term → Long Term →			
What targets are we seeking?	<p>To:</p> <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 yearReduce storm discharges (where overflows are present) to <10 in an average year by 2050			
How will we achieve the targets?	<div><p>We will:</p><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 solutionsConstruct deep tanks and tunnels to store combined sewageImplement property level protection measures to prevent individual buildings from hydraulic sewer flooding</div> <div><p>We will:</p><ul style="list-style-type: none">Further develop our catchment-level planning and implement large-scale surface water management strategies 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 systemsContinue to provide sewer network improvements by installing larger sewers to increase network capacityContinue to construct deep tanks and tunnels to store combined sewage</div> <div><p>We will:</p><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 and large-scale surface water management strategiesContinue to provide sewer network improvements by installing larger sewersContinue to construct deep tanks and tunnels to store combined sewageUse parks and urban spaces to store excess surface water during rainfall eventsContinue to implement property level protection measures</div>			

Risk Zone 4 – Wealdstone

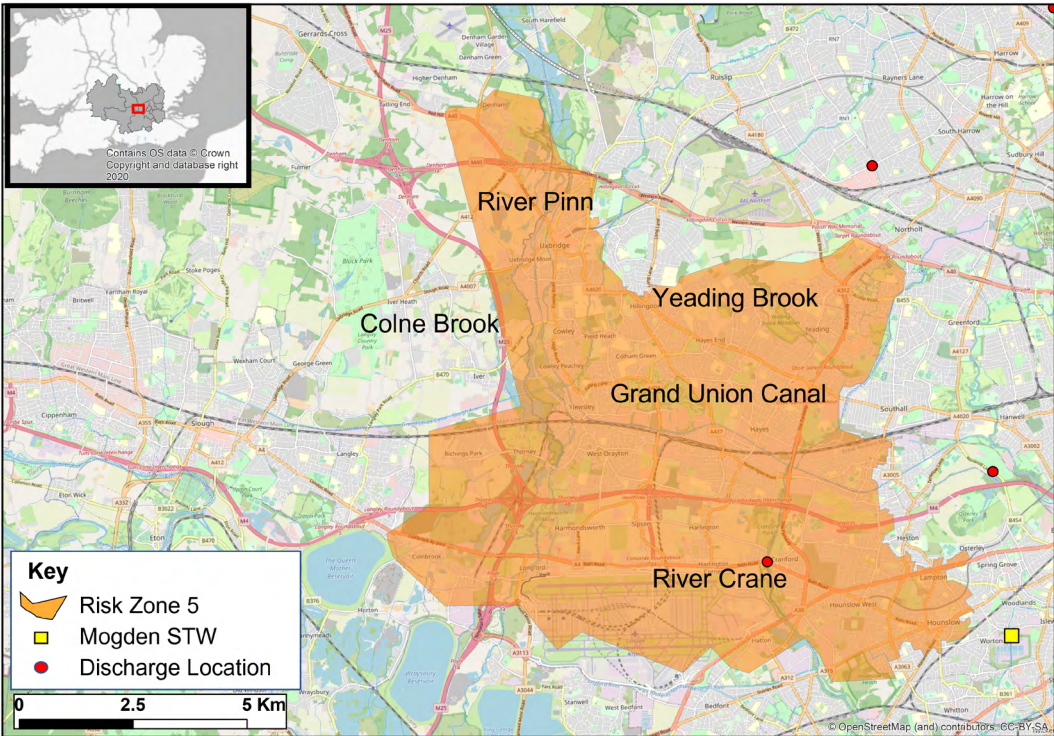
What are the challenges?	<ul style="list-style-type: none">Increased internal hydraulic sewer flooding - from 3.6 % to 6.1 % of properties: Calculated as increased modelled risk of internal hydraulic sewer flooding from 3.6 % of properties (3489) at risk up to a 1 in 30-year storm in 2025 to 6.1 % of properties (5952) at risk by 2050Increased external hydraulic sewer flooding - from 8.2 % to 11.7 % of properties: Calculated as increased modelled risk of external hydraulic sewer flooding from 8.2 % of properties (8045) at risk up to a 1 in 30-year storm in 2025 to 11.7 % of properties (11410) at risk by 2050Increased hydraulic sewer flooding - from 14.7 % to 21.8 % of properties: Calculated as increased modelled risk of internal hydraulic sewer flooding from 14.7 % of properties (14393) at risk up to a 1 in 50-year storm in 2025 to 21.8 % of properties (21333) at risk by 2050The three overflows in this area discharged 129 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



	2025	2030	2035	2050
Timescale	<div>← Short term →</div> <div>← Medium Term →</div> <div>← Long Term →</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			
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 and implement large-scale surface water management strategies 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">• Continue to 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 5 – West

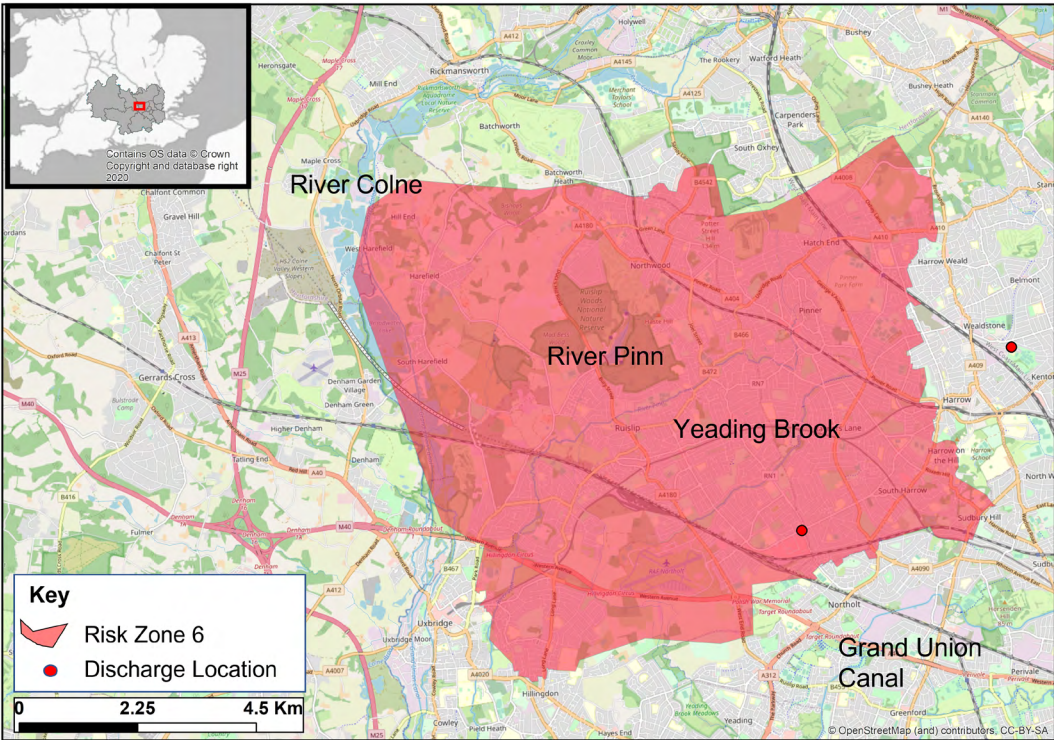
What are the challenges?	<ul style="list-style-type: none">Increased internal hydraulic sewer flooding - from 2.6 % to 5.6 % of properties: Calculated as increased modelled risk of internal hydraulic sewer flooding from 2.6 % of properties (3668) at risk up to a 1 in 30-year storm in 2025 to 5.6 % of properties (7869) at risk by 2050Increased external hydraulic sewer flooding - from 2.9 % to 5.6 % of properties: Calculated as increased modelled risk of external hydraulic sewer flooding from 2.9 % of properties (4093) at risk up to a 1 in 30-year storm in 2025 to 5.6 % of properties (7762) at risk by 2050Increased hydraulic sewer flooding - from 8.6 % to 12.7 % of properties: Calculated as increased modelled risk of internal hydraulic sewer flooding from 8.6 % of properties (11925) at risk up to a 1 in 50-year storm in 2025 to 12.7 % of properties (17680) at risk by 2050The only overflow in this area did not discharge in 2021
Which of our solutions are best suited?	<ul style="list-style-type: none">Surface water managementNetwork improvementsConstruct deep tanks and tunnelsConstruct deep tunnels to connect surface water network to major reuse or discharge locations



Timescale	← Short term →	← Medium Term →	← Long Term →
What targets are we seeking?	To: <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 yearReduce storm discharges (where overflows are present) to <10 in an average year by 2050		
How will we achieve the targets?	We will: <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 solutionsProvide sewer network improvements by installing larger sewers to increase network capacity	We will: <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 systemsContinue to provide sewer network improvements by installing larger sewers to increase network capacityConstruct deep tanks and tunnels to store combined sewage	We will: <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 surface water management solutionsContinue to construct deep tanks and tunnels to store combined sewageConstruct deep tunnels to connect surface water networks to major reuse or discharge locations

Risk Zone 6 – North

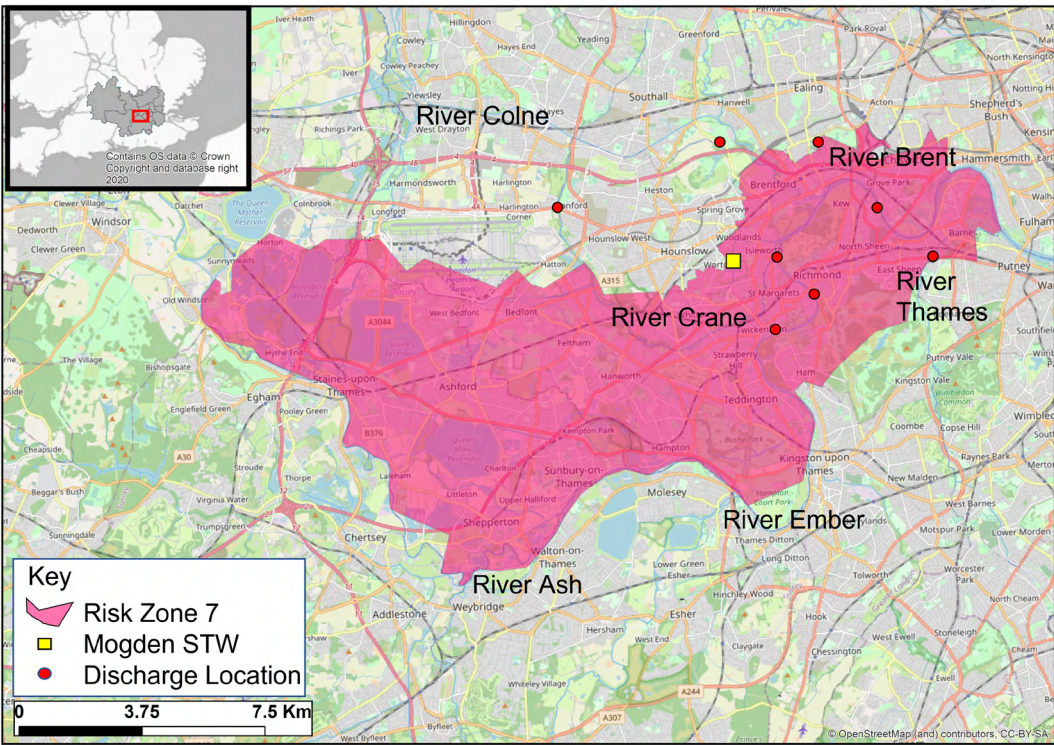
What are the challenges?	<ul style="list-style-type: none">Increased internal hydraulic sewer flooding - from 7.8 % to 15.4 % of properties: Calculated as increased modelled risk of internal hydraulic sewer flooding from 7.8 % of properties (8618) at risk up to a 1 in 30-year storm in 2025 to 15.4 % of properties (17037) at risk by 2050Increased hydraulic sewer flooding - from 17.8 % to 24.1 % of properties: Calculated as increased modelled risk of internal hydraulic sewer flooding from 17.8 % of properties (19750) at risk up to a 1 in 50-year storm in 2025 to 24.1 % of properties (26664) at risk by 2050The only overflow in this area discharged once in 2021
Which of our solutions are best suited?	<ul style="list-style-type: none">Surface water managementNetwork improvementsConstruct deep tanks and tunnels



	2025	2030	2035	2050
Timescale	<div>← Short term →</div> <div>← Medium Term →</div> <div>← Long Term →</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			
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	<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• 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 surface water management solutions• Continue to construct deep tanks and tunnels to store combined sewage	

Risk Zone 7 – South

What are the challenges?	<ul style="list-style-type: none">Increased internal hydraulic sewer flooding - from 0.6 % to 1.4 % of properties: Calculated as increased modelled risk of internal hydraulic sewer flooding from 0.6 % of properties (1493) at risk up to a 1 in 30-year storm in 2025 to 1.4 % of properties (3521) at risk by 2050Increased external hydraulic sewer flooding - from 0.9 % to 2.7 % of properties: Calculated as increased modelled risk of external hydraulic sewer flooding from 0.9 % of properties (2261) at risk up to a 1 in 30-year storm in 2025 to 2.7 % of properties (6681) at risk by 2050Increased hydraulic sewer flooding - from 2.0 % to 5.5 % of properties: Calculated as increased modelled risk of internal hydraulic sewer flooding from 2.0 % of properties (4930) at risk up to a 1 in 50-year storm in 2025 to 5.5 % of properties (13481) at risk by 2050The seven overflows in this area discharged 125 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 tunnelsInvest in our sewage treatment works to achieve 100 % complianceAdditional storage at our sewage treatment works



<div><div>2025</div><div>2030</div><div>2035</div><div>2050</div></div>				
Timescale	<div>← Short term →</div>		<div>← Medium Term →</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 yearReduce storm discharges (where overflows are present) to <10 in an average year by 2050Achieve 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 solutionsProvide sewer network improvements by installing larger sewers to increase network capacityConstruct deep tanks and tunnels to store combined sewage	<div>We will:</div> <ul style="list-style-type: none">Further develop our catchment-level planning and implement large-scale surface water management strategies 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 systemsContinue to provide sewer network improvements by installing larger sewersContinue to construct deep tanks and tunnels to store combined sewageProvide additional storage at our sewage treatment works	<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 large-scale surface water management strategiesContinue to provide sewer network improvements by installing larger sewersContinue to construct deep tanks and tunnels to store combined sewageInvest in our sewage treatment works to ensure complianceContinue to provide additional storage at our sewage treatment works	

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 Zone	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 (£)
Mogden STW	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	CP	CP	STW	Low
Mogden RZ2	2562 (1.6%)	6628 (4.1%)	12064 (7.4%)	8	45	5746 (3.5%)	11170 (6.9%)	22041 (13.6%)	13	236	3604 (2.2%)	8215 (5.1%)	15606 (9.6%)	<=10	CP	CP, DT, LSSWM, NI	DT, LSSWM, NI, SWM, URB	High
Mogden RZ3	2205 (1.9%)	4992 (4.3%)	9059 (7.9%)	5	65	4126 (3.6%)	7292 (6.3%)	13975 (12.1%)	19	310	1401 (1.2%)	4931 (4.3%)	8461 (7.3%)	<=10	CP, DT, IPP	CP, DT, LSSWM, NI	DT, IPP, LSSWM, NI, SWM, URB	High
Mogden RZ4	3489 (3.6%)	8045 (8.2%)	14393 (14.7%)	3	129	5952 (6.1%)	11410 (11.7%)	21333 (21.8%)	21	233	3158 (3.2%)	7503 (7.7%)	13466 (13.8%)	<=10	CP, DT, NI	CP, DT, LSSWM, NI	DT, LSSWM, NI	High
Mogden RZ5	3668 (2.6%)	4093 (2.9%)	11925 (8.6%)	1	0	7869 (5.6%)	7762 (5.6%)	17680 (12.7%)	4	44	5003 (3.6%)	5223 (3.7%)	11389 (8.2%)	<=10	CP, NI	CP, DT, NI	DT, DTSW, SWM	High
Mogden RZ6	8618 (7.8%)	9361 (8.5%)	19750 (17.8%)	1	1	17037 (15.4%)	7725 (7%)	26664 (24.1%)	17	616	13262 (12%)	8009 (7.2%)	22384 (20.2%)	<=10	CP, NI	CP, DT, NI	DT, SWM	High
Mogden RZ7	1493 (0.6%)	2261 (0.9%)	4930 (2%)	7	125	3521 (1.4%)	6681 (2.7%)	13481 (5.5%)	11	122	2832 (1.2%)	6081 (2.5%)	11598 (4.7%)	<=10	CP, DT, NI	CP, DT, LSSWM, NI, STR	DT, LSSWM, NI, STR, STW	High

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 risk zones where the risks are reduced below the target.

CP = Catchment-level planning including mapping and modelling

SWM = Surface water management

LSSWM = Large-scale surface water management

NI = Network improvements

DT = Deep tanks and tunnels to store combined sewage

DTSW = Deep tunnels to connect surface water networks to major reuse or discharge locations

URB = Use parks and urban spaces to store excess surface water

STW = Treatment process technologies and protection from high river levels

STR = Additional storage at sewage treatment works

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																			
New technical appendices x9	Appendix M - Assurance																			
	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 the website [here](#).