Our Drainage and Wastewater Management Plan

Technical Report May 2023

DWMP 2025-2050: Technical Document

Business in the Community Awards **Winner 2017**

Financial Times **Climate Leaders 2022**

The Queen's Awards for Enterprise: **Sustainable Development 2020**

Utility Week Awards 2021 Winner **Utility of the Year**

1. Our DWMP

Our long term strategic plan setting out how wastewater systems, and the drainage networks that impact them, are to be maintained, improved and extended over the next 25 years to make sure they are robust and resilient to future pressures.

This plan has been created over the past three years through engagement with our key stakeholders, and it proved an opportunity to not only plan together but to also generate efficiencies to make the most of outcomes arising from co-creation and delivery of solutions that address the risks we face.

The outputs from the DWMP will support the creation of our Long Term Delivery Strategy (LTDS) and our business plan for the 2024 Price Review.

This is our Drainage and Wastewater Management Plan (DWMP) covering 2025-2050. This Technical Report is a supplement to provide the details of the process of creating the DWMP, as set out in the Drainage and Wastewater Management Plan Framework.

There is a separate summary document which provides a non-technical overview of our plan which should be read prior to this document. You can also find a more interactive version of the DWMP online. As well as a summary overview document.

2. Executive Summary

This executive summary is an overview of our Drainage and Wastewater Management Plan (DWMP). It is a more detailed explanation than found in the summary document and sets to outline an overview of the creation and output of the draft plan.

2.1 Background

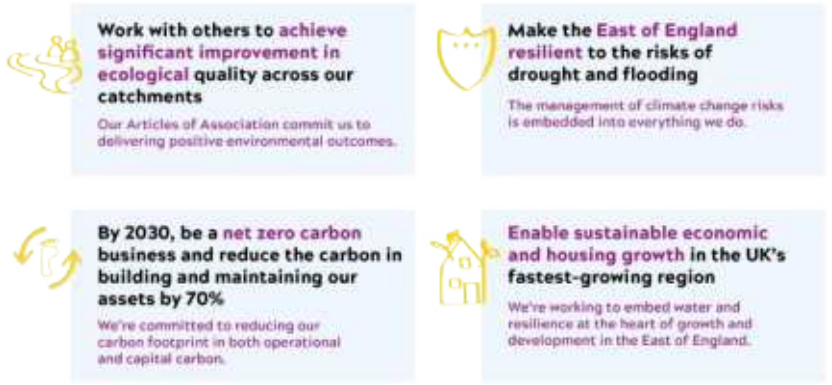
Our Purpose - to bring environmental and social prosperity to the region we serve through our commitment to love every drop - makes sure we think wider than the water we provide and the sewage we treat.

We're committed to using our purpose to develop long-term strategies which will enhance the experience we provide to our customers and support our strategic thinking to protect the environment.

Our Strategic Direction Statement (SDS) sets out our vision for the future, bolstered by our Strategic Context and our other strategic plans. And in the development of our Long Term Delivery Strategy (LTDS) we are building upon our SDS to set out our long-term vision for for the next 25 years, including what we intend to deliver in terms of key performance outcomes.

In our SDS, reviewed in 2021, we outline four long-term ambitions. Our DWMP builds on all four of these to ensure we serve our customers whilst meeting our purpose. Our DWMP also focuses on the medium and long term requirements to 2050. These will help us achieve our ambitions and show where we can work with others to realise benefits.

As the first water company to publish a 25-year Water Recycling Long Term Plan (WRLTP) in 2019, we are well placed to understand the immediate and longer-term challenges facing our region. The DWMP expands on our previous assessments by following the Drainage and Wastewater Management Plan Framework to understand the risks in our region due to growth and climate change. We serve a region that is the driest in the UK. It is prone to flooding events due to its low-lying topography and long coastline and it has a rapidly growing population, so it is important that we plan effectively for the future.



The aims and ambitions of the DWMP were published in the Strategic Context in October 2020, following a consultation on the document earlier that year. The planning objectives outlined within them were co-created with more than 100 of our stakeholders, who joined us on workshops and provided valuable consultation feedback. Since we started working on the DWMP in 2020 we have regularly encouraged and worked with our stakeholders to shape the plan from a collective view of risks and solutions. This document showcases the culmination of this collaborative project.

Our DWMP outlines our strategic direction and provides an indication of investment required in the short and medium term to meet this. We will continue to refine our DWMP strategy through the development of our Long Term Deliver Strategy (LTDS) and PR24 Business Plan.

The plan allows us to be adaptive by prioritising investment in catchments with the highest risk and investing in options which represent low or no regret outcomes. Furthermore, it provides the ability to defer investment in catchments with lower risk, whilst still showing that we have assessed what may be needed at a later point. This adaptive approach is key to

meeting the long-term challenges whilst keeping customers' bills affordable, supporting those struggling to pay their bills, and continuing to show progress in meeting the Water UK Public Interest Commitments

The approach to the DWMP has been through an external assurance process, looking at three key processes. The plan has been through multiple internal challenge boards both throughout its creation and prior to being published.

1. Our adaptive plan to meet the challenges we face over the next 25 years.
2. A strategic direction for our approach to minimise the risks we all face.
3. Takes a catchment-based approach to these risks and challenges we face.
4. Promotes the use of nature based solutions, especially when it comes to surface water removal.
5. Protects the environment through improvements to our discharges.
6. Demonstrates how we will serve our growing population over the next 25 years.
7. Shows what's needed to protect our assets and customers from the impacts of heavy rainfall caused by climate change.
8. Identifies opportunities for partnership working to release benefits and resolve risks through matched funding.
9. Will inform or align our other strategic plans, such as the Long Term Delivery Strategy (LTDS), Water Resources Management Plan (WRMP), Water Resources East (WRE) Regional Plan, Flood Risk Management Plans (FRMPs), River Basin Management Plans (RBMP) and Local Plans.
10. Includes all of our water recycling customers, regardless of who serves their water.
11. Excludes upstream water supply and downstream resources, which will be reviewed separately through our business plan.

Our DWMP builds on our experience of forecasting risk and investing in our assets where required. We know that to invest effectively in the right places we need to monitor the current situation. As an example of doing this in the past two years we have installed a large number of flow monitors in our catchments to ensure that we only trigger growth investment where we can see an increase in flow. This helps us to better understand our baseline risk and allows us to make fully transparent investment choices. We will continue to build on this as we go forward with future investments.

We know that changes over the next 25 years may impact this plan; for example, new technology may come in which will change our direction, growth may follow a differing trajectory, and climate change may be more - or less - intense than projected, as well as a number of other external factors which could impact the future. That's why we have placed a large emphasis on scalable solutions, and we will continue to refine our understanding of when solutions are required through the development of our LTDS and PR24. We have proposed a plan that is resilient and adaptable to change, and a plan that enables us to work with our stakeholders to achieve these goals.

We provided two opportunities for feedback on our draft plan, through a consultation on the draft DWMP during summer 2022, and a second consultation focussing on storm overflows in spring 2023. Thank you to everyone for the feedback provided during those periods. You can see all consultation comments in our published Statement of Response, and review how these have helped shape this final DWMP.

2.2 Our region

We provide water recycling services to customers across the East of England region. For our DWMP, our Level 1 plan refers to our water recycling boundary.

We serve more than 1,100 water recycling catchments ranging from small rural catchments with less than 50 people, to large urban catchments serving more than 300,000. These are our Level 3 catchments. All level 3 catchments were reviewed for the first stage of the DWMP, with those identifying any potential risk passing through to the next stage of the DWMP process. This risk based approach meant we have taken almost 600 catchments through the DWMP process, focussing on those catchments most affected by planned growth and climate change.

To ensure effective engagement with our stakeholders, and to present information and collate risks, we have also provided a Level 2 summary. Within our documents these are collated to a Catchment Based Approach (CaBA) level, as agreed with our stakeholders in our Strategic Context.

Online you are able to see Level 2 information at an aggregated level which best fits your needs; we have provided this at the level of counties, Internal Drainage Board (IDB) areas, Regional Flood and Coastal Committees (RFCC) areas and local council areas.

2.3 The challenge

Over the next 25-years we will see significant population growth in our region, alongside more intense rainfall from climate change and 28% of our region being below sea level. Additionally, our region is home to 47 sites of special scientific interest (SSSI) and the UKs only wetland national park, the Norfolk Broads. As well as 48 bathing waters, 3,300km of rivers, 1,200km of coastline and there is a rising interest in ensuring we are transparent in our impact on these. Our Climate Change Adaptation Report, published in 2020, highlights our historic performance and outlines our planned measures and commitments to mitigate the impacts.

To address the risks above we've focussed our efforts on reviewing 10 planning objectives.

Table 1 Planning Objectives

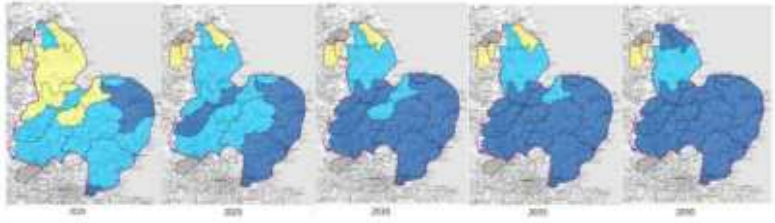
SDS Ambitions *What are we ultimately trying to achieve across the region*	Outcome *How does it track back to our outcomes*	Planning objective *What are we measuring*	Theme *What group does this fit in?*
Resilient to the risks of flooding	Resilient business	Risk of sewer flooding in a 1 in 50 year storm	Escape from sewers
	Flourishing environment	Storm overflow performance	
Enable sustainable economic and housing growth	Investing for tomorrow	External sewer flooding risk	
	Delighted customers	Internal sewer flooding risk	
Be a carbon neutral business by 2030	Flourishing environment	Pollutions risk	
Work with others to achieve significant improvement in ecological quality	Investing for tomorrow	Sewer collapse	
	Investing for tomorrow	DWF Compliance	WRC Compliance
	Investing for tomorrow	Quality compliance	
	Delighted customers	Access to amenity areas	Environment and wellbeing
	Flourishing environment	Green infrastructure	

During the Baseline Risk and Vulnerability Assessment (BRAVA), as outlined in more detail in 5.5 Baseline Risk and Vulnerability Assessment (BRAVA) we reviewed the impact of growth and climate change against each of the planning objectives. Whilst we see an increase in risk in almost all planning objectives, the increased risk of flooding and pollutions is highest, followed by the risk to dry weather flow (DWF) compliance at Water Recycling Centres (WRCs).

The maps below show the increase in risk for external flooding, and the increase in risk for pollutions, from 2020 to 2050 if we do not take any action. The level 3 catchment risks have been aggregated to demonstrate risk at a Catchment Based Approached (CaBA) level 2.

Figure 1 Increase in risk for external flooding from 2020 to 2050 if no action is taken

Figure 2 Increase in risk for pollutions from 2020 to 2050 if no action is taken



2.4 Stakeholder input

The key ethos of the DWMP is to co-create the strategy through regular engagement with stakeholders. We have shared the DWMP with as many stakeholders as possible to get their feedback and information to shape our plan, identifying 117 key stakeholders to actively encourage to engage throughout the process. These included all of our county councils, district councils, Lead Local Flood Authorities (LLFAs), the Environment Agency, Internal Drainage Boards (IDBs), River and Wildlife Trusts, Natural England, Ofwat, as well as local river and environmental groups.

Throughout the DWMP process to date, stakeholders have been encouraged to engage at all stages through a range of channels. We have provided eight key opportunities for stakeholders to interact with the different stages of the development of the DWMP. As well as encouraging informal conversations throughout its development.

The level of engagement at each stage has varied; however, the areas where stakeholders have been more involved have allowed us to create strong links and identify future collaborative opportunities.

The timeline below demonstrates the different opportunities we have provided for stakeholder engagement with the emerging plan.

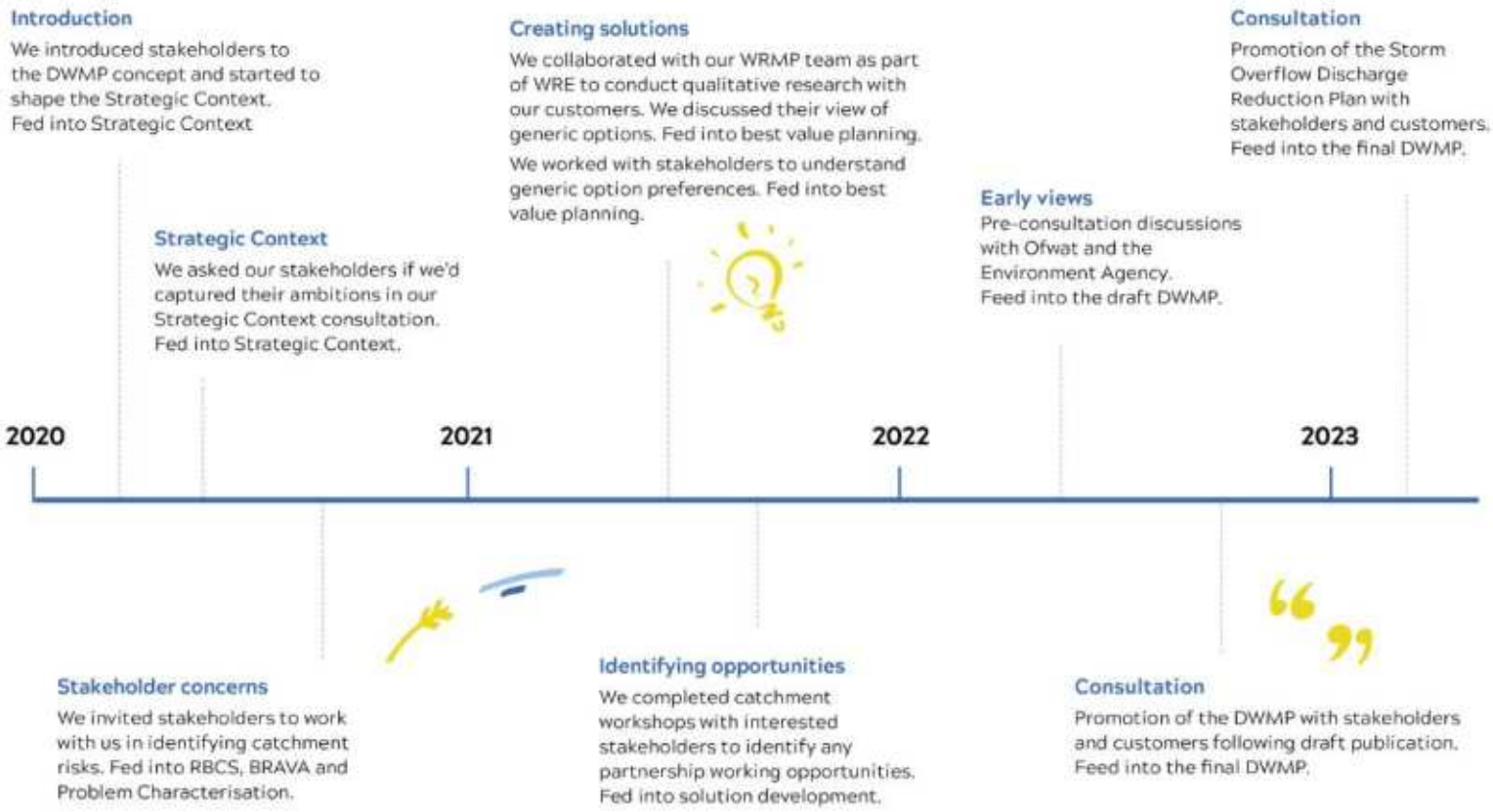
We have produced a Statement of Response to feed back to comments made through our formal consultation processes.

The outputs from this engagement have:

- Identified where risk is wider than just a water company issue.
- Prioritised where we should focus on identifying stakeholder partnership solutions.
- Provided information for our best value assessment.
- Shaped our final strategies.
- Shaped our response to the Storm Overflow Discharge Reduction Plan.
- Given us confidence in this final DWMP.

We have also talked about the plan with key stakeholders whilst interacting with them on other issues - finding opportunities to explain our approach and plan. Where relevant, we've highlighted the importance of the DWMP. We've had opportunities to do this at various groups and meetings such as when presenting at county and district council overview and scrutiny committees.

Customer and stakeholder engagement



2.5 Customer input

The stakeholder and customer engagement on the DWMP is part of a wider engagement strategy for all of our strategic plans, including our PR24 Business Plan. We have engaged with customers and stakeholders to ensure that decisions made in our strategies are informed by them.

The stakeholder and customer engagement informs our long term ambitions as part of our Long Term Delivery Strategy (LTDS) as well as the shorter term PR24 Business Plan. This includes engaging with future customers and those in circumstances that might make them vulnerable or hard-to-reach, including those that are transiently vulnerable. As part of our plans, we will present evidence that affordability issues have been explored with customers, including how the interests of future customers have been considered, and that these views have informed the strategy.

Plans will also be subject to robust challenge and assurance to ensure that our decisions have taken account of customers' views, preferences and experiences at all stages of the process.

We held three customer engagement sessions on issues specific to the development of our final DWMP.

1. Online platform - Customer Priorities

2. Online platform - Customer Solution Preferences

3. Focus group - Storm overflows

Our online research platform is a community of customers who have agreed to be contacted by us toshare their voices and opinions on a range of topics related to Anglian Water's services. The platform offers both quantitative and qualitative research tools, both of which we utilised to ask our customers about their priorities and preferences around issues that the DWMP is addressing and the options offered to do so. The focus group, ran through our Anglian Water Knowledge Hub community via video conference, provided an in-depth discussion with our customers surrounding the topic of storm overflows. This helped us gauge our customers' trust and confidence levels in our ability to meet Storm Overflow targets set by DEFRA, alongside understanding customer preferences for how we should meet these targets.

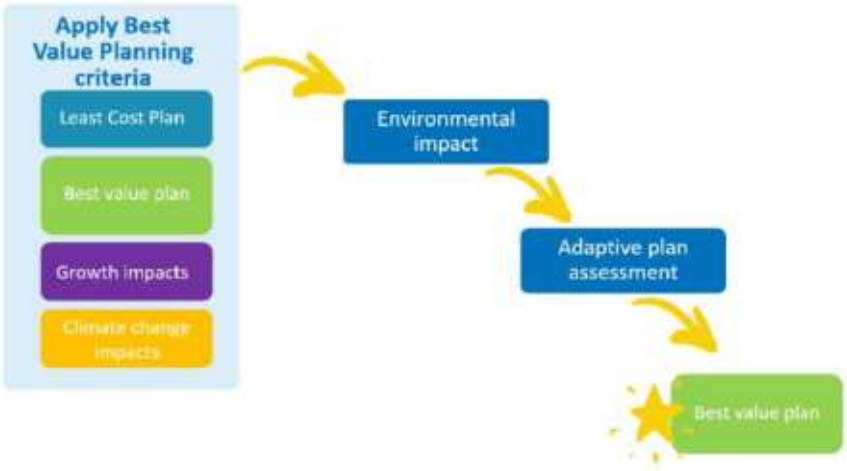
2.6 Best Value Plan

In order to assure that the DWMP plan is the best for our customers and the environment we have tested a variety of scenarios:

- Least cost plan
- Growth scenarios
- Best value plan
- Climate change scenarios

These have been reviewed against the environmental impact based on the current plans in the WRMP, assessed for their adaptability, before finally producing the best value plan outlined in this document.

Figure 3 Best Value Plan process



We've tested our plans against 13 scenarios, to assess what an adaptive and best value plan would look like. These scenarios form the starting point for our long term delivery plan assessments and ensure that we understand not only the risks we can address, but also the level of risk we may continue to carry.

These scenarios were:
1. Low growth.
2. High growth.
3. Least cost.
4. Scalability - least regret solutions.
5. Recreational amenity.
6. Natural capital.
7. Pollution reduction.
8. Flooding reduction.
9. Stakeholder preference.
10. Overall best value plan for growth.
11. Increase in capacity.
12. Maximising WRC performance.
13. Maximising WRC DWF compliance

All of our best value framework is aligned to our wider business Purpose and tested against the six capitals framework. Our six capitals framework, set out in our business model, is a key tool to help us. By taking the six capitals – natural, social, financial, manufacturing, people and intellectual – into account when making investment decisions, we can stimulate the creation of options with a wider range of value creation, and move examples of best practice and innovation into business as usual.

Using a six capitals lens will help us keep our responsibility to customers, communities and the environment at the front of our minds when making business decisions.

Figure 4 Six Capitals

Assessment against the 6 capitals has shaped thinking in the six key areas we've focussed on for the DWMP:

1. Cost.
   Understanding the initial outlay and cost profile, as well as the whole life cost (WLC) of the solutions.
2. Adaptability to future risk.
   This is key to ensure that we invest in the right areas at the right time. To understand this, we have assessed whether the options we are proposing are scalable or limiting the future options. We have also taken forward the options that are selected the most across all scenarios.
3. Environmental benefit.
   The solutions have been assessed for their ability to enhance the environment, either through being a natural solution or from protecting the environment.
4. Carbon.
   The amount of carbon used to create each solution.
5. Customer and stakeholder preference.

Any solution type preferences identified from our engagement.

6. Customer and community wellbeing.
   Are we improving the customer experience through reduced spills, flooding or pollutions?

Our objective is to create a plan that outlines the long-term strategic requirements and estimates the costs of the short and medium term interventions that will help to deliver these. Our best value framework ensures that the identified plans for the short and medium term would meet the strategic 2050 ambitions.

2.7 Storm Overflows

Storm overflows are an important part of the sewerage system as they allow a release from the system in periods of intense rainfall. The discharges to the environment are diluted by rainfall and reduce the risk of property flooding. Although storm overflows have been the subject of much recent media attention, receiving waterbodies have various sensitivities and can be impacted by a range of sources, with less than 1% of the reasons a water body is not achieving good being driven by storm overflows.

We are keen to improve the impact of storm overflows, whilst working with others to progressively eradicate harm through a common goal of improving river health. In 2022 we launched our Get River Positive campaign where we have made several commitments, which include:

- Eliminate all serious pollutions by 2025
- Reduce less serious pollutions by 45%
- Reduce spills from storm overflows to an average of 20 per year by 2025

In August 2022, Defra released their Storm Overflow Discharge Reduction Plan (SODRP). The plan outlines a range of targets water companies must meet to reduce the impact of storm overflows on the environment.

SODRP Targets

1. Water companies will only be permitted to discharge from a storm overflow where they can demonstrate that there is no local adverse ecological impact.
   - The headline target must be achieved for most (at least 75%) of storm overflows discharging into or close to high priority sites (as defined in Annex 1) by 2035.
   - It must be achieved for all (100%) storm overflows discharging into or close to high priority sites by 2045.
   - Water companies must achieve this target for all remaining storm overflows sites by 2050.
2. Water companies must significantly reduce harmful pathogens from storm overflows discharging into and near designated bathing waters, by either: applying disinfection; or reducing the frequency of discharges to meet Environment Agency spill standards by 2035.
3. Storm overflows will not be permitted to discharge above an average of 10 rainfall events per year by 2050.
4. Water companies will be required to ensure all storm overflows have screening controls.

2.8 Preferred plan

There are always uncertainties about how the world will look in 2050. It has therefore been important that we create a DWMP that is adaptive to a range of future scenarios, including a two or four degree climate change increase and a variety of growth projections.

We have identified optimal solution strategies, as well as alternative options if factors change. The plan outlines when we expect these strategies would be required, but we will continue to refine our DWMP strategy through the development of our LTDS to understand when investment needs to be made and when a decision can be delayed. We will ensure the situation is monitored appropriately through our LTDS monitoring plan. This gives us the flexibility to ensure that we invest in the right places at the right time, protecting both our customers and the environment.

We believe that the DWMP is sufficiently flexible and adaptable to accommodate future uncertainties.

2050 Level 1 View

Following the initial screening, almost 600 of our water recycling catchments were assessed at 2050 to understand the impact from future growth and climate change. Our assessment process, as outlined in 5. Plan development, considered risk to our water recycling catchments against our agreed planning objectives.

We assessed risk in 2030, 2035 and 2050. This process identified that 218 catchments presented low risk in 2050. For these catchments no further work was completed, we will continue to monitor in future DWMP cycles.

For the remaining catchments we reviewed when the risk is presenting itself and identified a range of potential solutions to address the risk. The summary of needs identified earlier than 2050 are outlined in the section below. Many of these strategies proposed are due to either reduce the risk to an acceptable level by 2050 or create an uncertainty that means we need to continue to monitor the catchment post-intervention. These catchments will be reviewed in future cycles of the DWMP to understand if further interventions are required.

A total of 63 catchments indicated a low risk of concern by 2035, but an increase in risk by 2050. We evaluated a range of options to address these risks, using modelled data and our understanding of the catchments.

Removing up to 25% of surface water from our network was the most popular long-term strategy for addressing the risk from Escape from Sewers. We are keen that nature based solutions are promoted where possible and where it is identified as being cost beneficial. Therefore, many of our catchments are promoting a mix of greener Sustainable Drainage Solutions (SuDS) and more traditional infrastructure.

Storm overflows across the region have been assessed for their compliance against the Storm Overflow Discharge Reduction Plan, with over 1,000 overflows identified for investigation and potential investment over the next 25 years. Supporting our purpose to bring environmental prosperity across the region.

For our water recycling centres (WRCs), we're facing an increase in pressure between the extra loading received from catchment growth and the tightening standards required to meet the river water quality. Over the next 25 years we're going to have to think differently about how we might address the future risks, whether this be through using a treatment technology not yet invented, or by thinking of alternative strategies. Due to the uncertainties around future technology we've completed the DWMP working on current known technologies; however, we will adapt our strategies to incorporate new technologies when appropriate.

There are a range of strategies identified for addressing the risk from WRCs. These range in complexity and scale, from customer education, infiltration removal to reduced flows, or larger investment solutions. For many of our WRCs we feel the future risk should be addressed through traditional measures, such as increasing capacity by building more treatment processes and, where appropriate, applying for new environmental permits from the Environment Agency. There are some catchments where we have identified a need to monitor catchments together, with the potential to rationalise WRCs by closing one and transferring flow to another. We have identified the potential need to build a new WRC on the west of Norwich, depending on level and location of growth. As well as a number of WRCs being identified as having the potential to develop a wetland as part of the treatment process, if required in the future.

2050 Level 1 Costs

Our best value planning indicates that over the next 25 years we may need to spend up to £5 billion to manage future risks, resolve some existing concerns, and meet our Storm Overflow Discharge Reduction Plan targets. This has been built up from detailed cost assessments of the catchment wide solutions.

This £5 billion plan includes a medium level acceptance of risk including:

- A proportional view of the growth forecast based on both ONS and local authority data.
- Addressing the impact of a 2 degree increase due to climate change in most solutions and the ability to be, prepared for a 4 degree increase in some catchments.
- Least regret options - choosing solutions which can be scaled to meet a range of future scenarios.

Table 2 Overview of DWMP Best Value Plan

Cost (£ billion)	Number of catchments	Climate change provision	Number of green solutions
5	333	2 degrees	68%

Adaptability

Whilst the above outlines our preferred plan for the DWMP, we also considered a range of other scenarios.

The DWMP is to be seen as setting the strategic direction for the next 25 years and provides an indicator of the level of investment we might need to manage the risks identified. The DWMP is also designed to be adaptive. As outlined in the DWMP framework the plan focusses on being best value, having given consideration to providing the optimum benefit of cost to risk ratio.

Although the DWMP provides an indication of when solutions may be required, this will be reassessed as part of the development of our LTDS and PR24 Business Plan. This includes using the Common Reference Scenarios to establish what investment is required now, and what can be delayed until later in the timeline. We will also need to review the DWMP within the context of the wider enhancement programme, to ensure the strategy is both affordable and deliverable. However, the strategies outlined in the DWMP will still be valid for the direction of those individual catchments.

2025-2035 Level 1 view

300 of our catchments in the DWMP process identified that risks were either already present or would be by 2035.

We reviewed where we already have investment planned in the current funding period to ensure that we weren't trying to resolve any risks already being addressed. Where these were identified the catchments will be monitored and assessed again in the next DWMP cycle.

When assessing the range of options available we looked to see whether it was possible to address the risk in the short term through a no, or a very low, cost strategy in the first instance. Where this was feasible it was chosen as a preferred solution. In many cases a range of solution strategies were available to us and the alternative strategies were reviewed through the best value planning assessment.

The DWMP takes a catchment strategy assessment approach by costing one solution to address multiple risks in the catchment. Further work will be undertaken prior to our next business plan to understand which elements of these solutions will be prioritised.

As per the 2050 strategies, we have a strong focus on removing surface water from the sewerage system through a range of mixed Sustainable Drainage Solutions (SuDS) and traditional attenuation strategies. These solutions provide resilience against a two degree increase in temperature caused by climate change and, in some cases, allows us to be fit for a four degree increase.

Working to remove unrequired flows from our network is also a key strategy in addressing risk at our WRCs, alongside increasing capacity where required. We have also identified several sites where the risk is slightly lower, and we need to complete further investigations before identifying the best solution.

Working with our partners we've collectively identified a number of catchments where partnership working will be a feasible solution to support in reducing risk. The options identified have ranged from co-ordinated targeted education plans to partnership funded schemes. These will be collaboratively developed further over the coming months to ensure we capture them in our business plan.

Based on the £5 billion 25 year plan we expect that £1.9 billion, including £500 million to for Storm Overflows, would be required in the first two investment periods, 2025-2035. The breakdown of this is identified in the level 2 summaries at the end of the document.

2.9 Alignment with other plans

We are aware that there are many strategic plans identifying risks of the future, both being created by us and our stakeholders. It was important that whilst creating the DWMP we worked together to ensure we did not duplicate work or identify conflicting strategies.

Our other key strategic plan that we produce as a water company is the Water Resources Management Plan (WRMP). The WRMP reviews the forecast risk of meeting the supply and demand of water usage over the next 25 years. Alongside the WRMP, Water Resources East (WRE) Regional Plan has been working with stakeholders to understand the wider view of supply and demand risk. Some of the solutions proposed to address this risk directly impact the water recycling element of our business, therefore it has been important that we have worked together throughout the creation of both plans.

Local plans outline the anticipated level of growth in their areas. As with the WRMP, we used these numbers as our basis for the anticipated growth in the region. Whilst we appreciate that this may be seen as an optimistic forecast, we have created evaluated assessments against a range of future growth scenarios.

During DWMP creation the Environment Agency have published their Flood Risk Management Plans (FRMPs) which sets out how organisations, stakeholders and communities will work together to manage flood risk. As well as being consulted on the next draft River Basin Management Plans (RBMPs). We have worked with the Environment Agency and incorporated the strategic goals into the DWMP at a water recycling catchment level where identified.

Alongside strategic plans we have made several commitments, including:

- The Get River Positive initiative jointly with Severn Trent which includes eliminating serious pollutions in our region.
- Achieving net-zero carbon by 2030.
- 70% reduction in capital carbon by 2030.

Additionally, we have increased interest in several environmental issues such as impact on water quality from storm overflows, nutrient neutrality, and catchment based solutions. All of these will feed into shaping the next 25 years and will be considered in future iterations of the DWMP.

2.10 Forward look

In this DWMP we have tried to develop a plan that is best value and will enable sustainable housing and economic growth, adapt to climate change, and protect and enhance our environment. We have tested the plan against the full range of best value measures, consulted with stakeholders and sought to ensure that it supports the delivery of our strategic ambitions.

However, these issues are complex. As such, effective interaction with many other organisations and their forward plans will be essential to delivering the outcomes that customers, communities and the environment needs.

As outlined earlier, the DWMP will feed into our Long Term Delivery Strategy and PR24, enabling us to review the risks across the business both in the short and long term. The outcome of PR24, as approved by Ofwat, will identify the financial envelope we will be working within during our next funding cycle AMP8 (2025-2030).

Although the output of this DWMP is a static view, the assessment of risk is an ongoing and adaptive process, with investments triggered once critical thresholds for key metrics have been met. We will continue to work with our stakeholders and customers to share information and develop collaborative solutions where opportunities are identified.

The **largest** water and water recycling company in England by geographic area

Serving almost

7 million

customers across the East of England

The driest region in the UK with

2/3

of the national average rainfall each year

One of the UK's fastest-growing regions, projected to grow by

750,000

people by 2050

Operating

76,000km

of sewers – laid end-to-end almost twice the earth's circumference

Over

3,300km

of rivers and is home to UK's only wetland national park

3. Introduction

Summary

Here we present the outline of the Framework for Production of Drainage and Wastewater Management Plans and how we used this to shape the backbone of our plan.

This DWMP outlines our plan for water recycling to deal with this growth and climate change over the next 25 years - from 2025-2050. In particular it describes the risks we face against 10 planning objectives across three themes - escape from sewers, WRC capacity and environment and wellbeing.

We haven't done this on our own. Throughout the process we've consulted, discussed and co-created with stakeholders to ensure the plan we've put forward is the best value plan to address these risks. Where relevant we've included the outputs from our stakeholders' strategies, as well as capturing concerns from other interested parties.

Because our DWMP is helping to set the strategic direction to address growth and climate change, the outputs will also feed into our Long Term Delivery Strategy (LTDS) and our next business plan (called PR24). The DWMP outputs will be refined and assessed against wider business needs as part of PR24 planning, before being reported in out LTDS and PR24 submission to water regulator Ofwat.

The DWMP follows guidelines outlined in the Framework for Production of Drainage and Wastewater Management Plans, which were published in 2019. These plans were commissioned by Water UK in collaboration with Defra, Welsh Government, Ofwat, Environment Agency, Natural Resources Wales, Consumer Council for Water, The Association of Directors of Environment, Economy, Planning and Transport (ADEPT) and Blueprint for Water. In August 2022 Defra, alongside Ofwat and the Environment Agency, published the Guiding principles for drainage and wastewater management plans. All organisations involved in the development of the DWMP concept were continually consulted with throughout the development of the plans through an industry DWMP steering group.

This first DWMP is an evolution from the Water Recycling Long Term Plan we published in 2018, and the DWMP will be refreshed in five years, with the Environment Act making the production of DWMPs for the next round onwards.

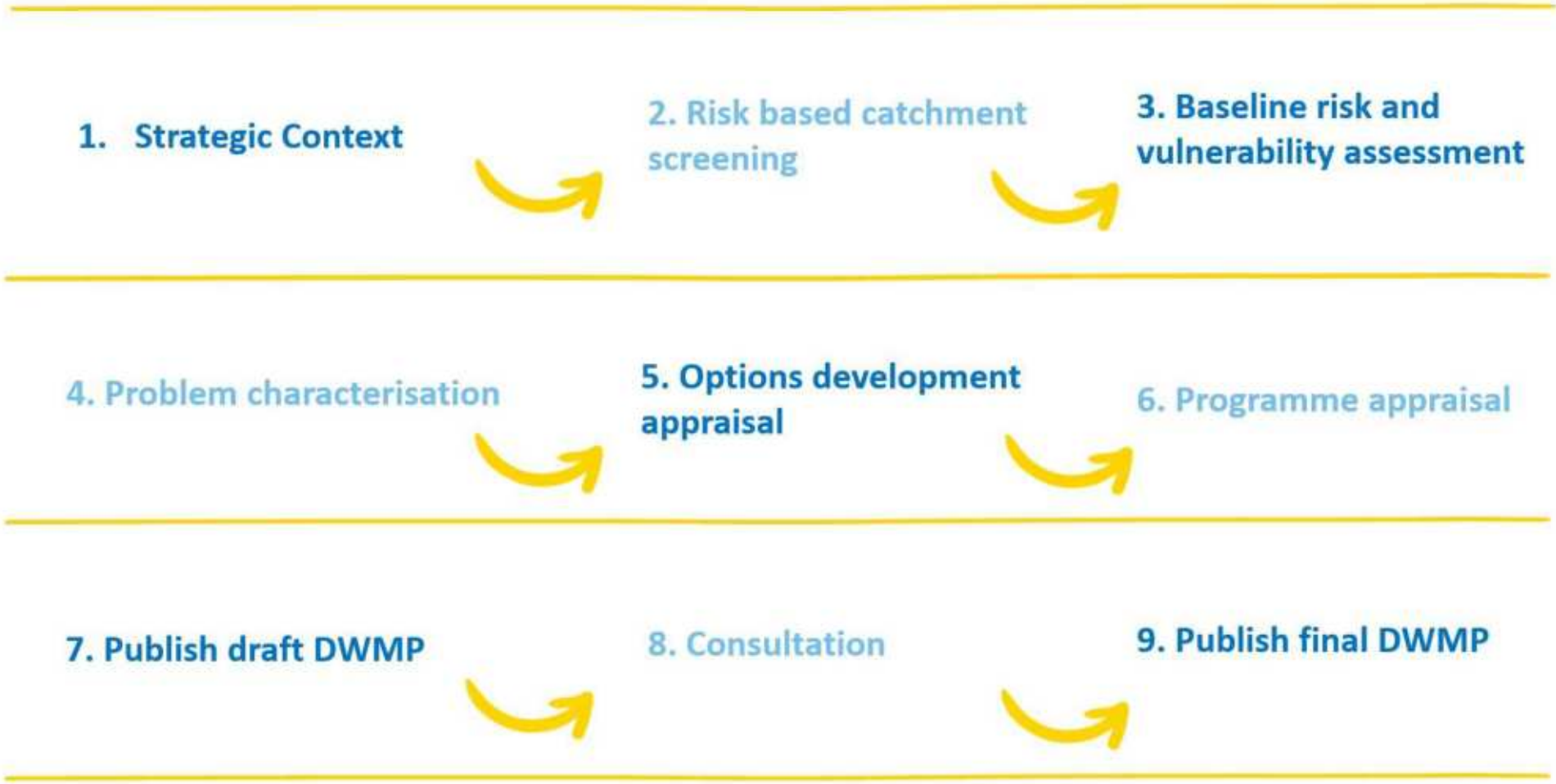
Our strategic context document explains the aims for the DWMP and was created using the outputs of a stakeholder engagement workshop, then further refined through comments from the consultation held in 2020. It accompanies this DWMP report. You can also find a non-technical summary of the DWMP, as well as an interactive DWMP and a summarised overview on our website.

3.1 The building blocks of DWMP

The Framework for the production of Drainage and Wastewater Management Plans, published in 2018 outlines the stages which companies need to follow to create a DWMP. There are 9 key processes to work through. The methodology used to complete stages 1-6 are outlined in this document.

1. Strategic Context - agreeing and outlining the aims of this DWMP
2. Risk Based Catchment Screening - identifying the areas most at risk
3. Baseline Risk and Vulnerability Assessment - understanding the risk over 25 years
4. Problem Characterisation - assessing any complicating factors
5. Options Development - identifying the range of potential options
6. Programme Appraisal - prioritising using best-value assessment
7. Publishing Draft DWMP
8. Consultation
9. Publication of Final DWMP

Figure 5 Nine Steps to the DWMP



3.2 Planning areas

To help us gather data and share results more effectively we have worked at the following three levels.

Level 1

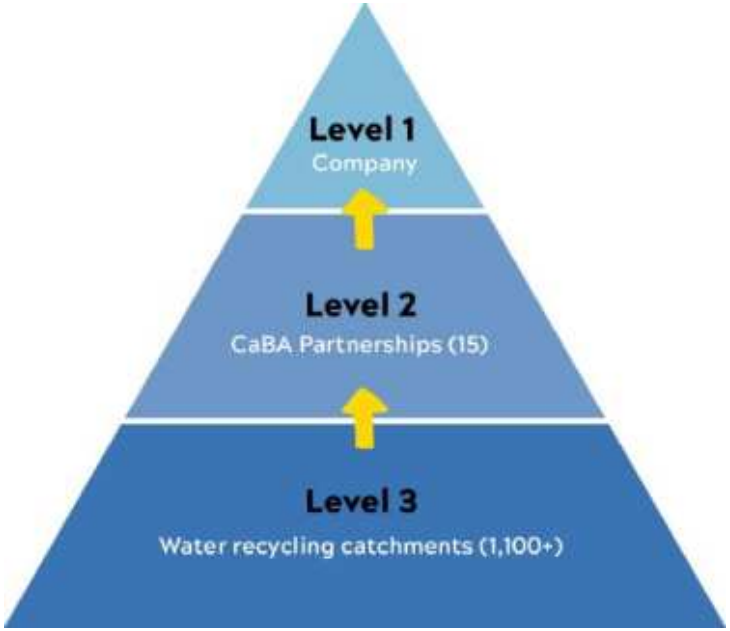
The whole of the Anglian Water region covering our water recycling facilities makes up the Level 1 (L1) planning area. This includes any area we provide water recycling services too, even if we do not provide water.

Level 2

Following a workshop held with stakeholders in January 2020 it was agreed that Catchment Based Approach areas (CaBA) would be a suitable Level 2 (L2) for the purpose of sharing documented information. CaBA is a community led approach that engages people and groups from across society to help improve our water environments. However, it was also acknowledged that CaBA as a L2 would not be right for everyone, so we agreed that for the online DWMP, there would be a range of L2 options available for the user to self-serve data to suit their needs. Our online DWMP includes L2 information at CaBA, council boundaries, Regional Flood and Coastal Committees (RFCC), Internal Drainage Board (IDB) areas and county.

Level 3

Anglian Water oversees more than 1,100 water recycling catchments, and each catchment is classed as a Level 3 (L3) planning area.



4. Stakeholder Engagement

Collaboration is key to the success of the DWMP, which is why we've encouraged and teamed up with stakeholders on a regular basis to co-create the strategy.

4.1 Who have we engaged with?

To help shape the DWMP we have shared the process with as many stakeholders as possible to get their feedback. We've reached out to all our county councils, district councils, Lead Local Flood Authorities (LLFAs), the Environment Agency, Internal Drainage Boards (IDBs), River and Wildlife Trusts, Natural England and Ofwat, as well as local river and environmental groups. Totalling 117 stakeholder organisations.

Stakeholder engagement has been a vital part for us to be able to confidently say that this DWMP has truly been co-created. At each engagement point your comments have shaped the next stage of the plan, as outlined in the following sections.

In total there were eight key points where we've asked stakeholders to get involved with the process. Below is a summary of how many took part at each stage:

Table 3 Summary of engagement activities

Engagement Activity	Number participated	% over overall stakeholders
Launch workshop	30	26%
Strategic context consultation	16	14%
RBCS feedback	29	25%
BRAVA feedback	10	9%
ODA generic options	48	41%
ODA catchments	27	23%
Draft DWMP consultation	39	33%
Draft Storm Overflow Reduction Plan Consultation	8	7%

The level of engagement from stakeholders has varied which is to be expected given that this is a new process for organisations to find time and people for. However, the engagement received has been invaluable for ensuring the plan reflects stakeholder requirements.

Below you can see a full list of stakeholders who worked with us at at least one point throughout the process:

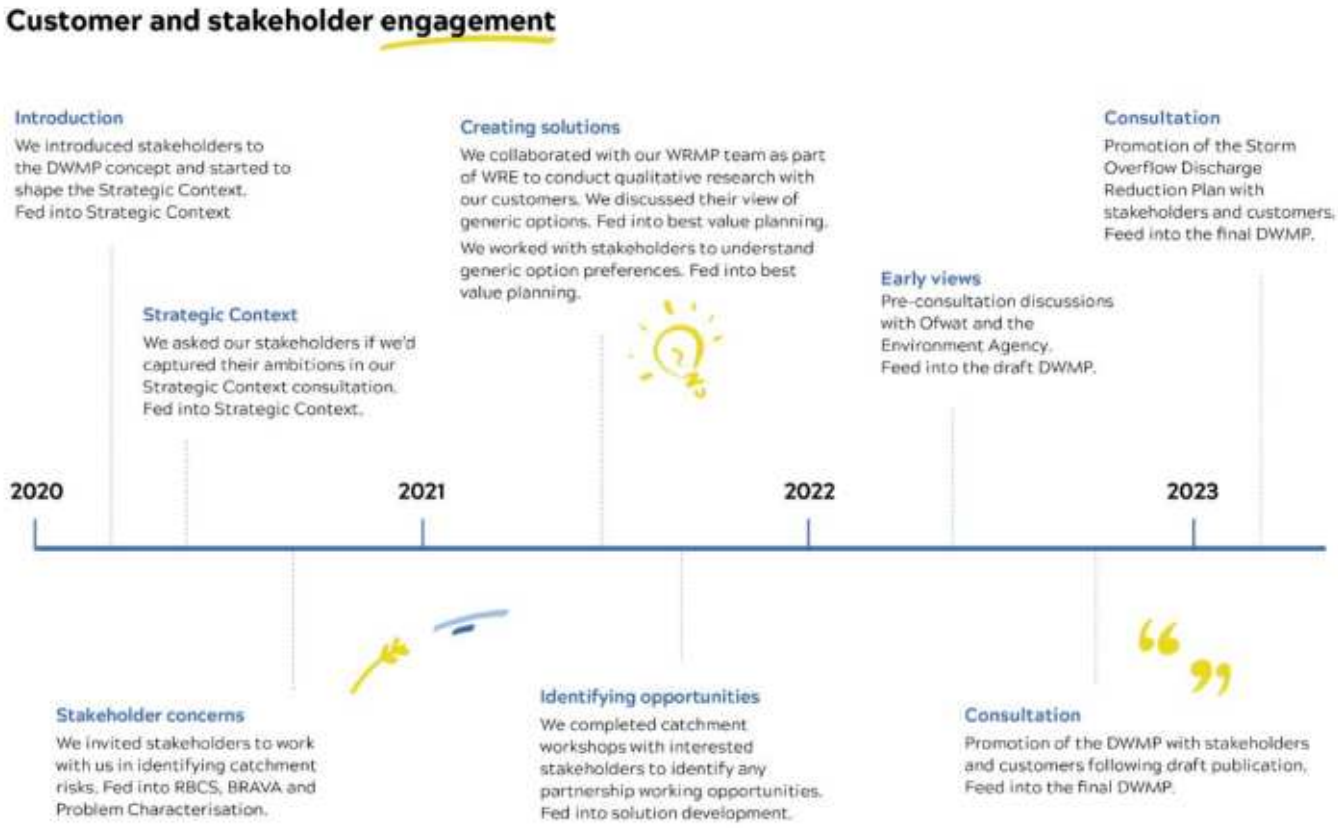
Table 4 Engaged stakeholders

A	Angling Trust - Affinity Water
B	Babergh and Mid Suffolk District Councils - Basildon Council - Borough Council of King's Lynn & West Norfolk - Bedford Borough Council - Bedford Group of Internal Drainage Boards - Braintree DC - Breckland Council - Broadland Catchment Partnership - Broads Authority - Broads Angling Services Group - Buckinghamshire CC - Business In The Community
C	Cam Valley Forum - Cambridge ACRE - Cambridge City and South Cambridge District Council - Cambridge County Council - Cambridge Green Party - Central Bedfordshire Council - Central Lincolnshire Council - City of Lincoln Council - Colchester Borough Council - Consumer Council for Water - Cranswick Country Foods - CURAT

D	Daventry District Council - Defra
E	East Lindsey DC - East Northamptonshire Council - Ely Drainage Boards - Environment Agency - Essex County Council - Essex Highways - Essex Wildlife Trust - Euston Estate
G	Greater Cambridge Planning Service - Great Yarmouth Borough Council
H	Harborough District Council - Hertfordshire County Council - Hislmp Parish Council - Huntingdonshire DCIMDB
I	Ipswich Borough Council
L	Leicestershire County Council - Lincolnshire Chalk Streams - Lincolnshire County Council - Lincolnshire Rivers Trust - Lincolnshire Wildlife Trust - London Borough of Havering - Luton Borough Council
M	Maldon District Council - Marine Management Organisation - Middle Level Commissioners - Milton Keynes Council
N	National Farmers Union - Natural England - Newark and Sherwood District Council - Norfolk County Council - Norfolk Rivers Trust - North East Lincolnshire Council - North Kesteven DC - North Lincolnshire Council - North Northamptonshire Council - Northampton Borough Council - Northamptonshire County Council - Notts Wildlife Trust
O	Ofwat
P	Peterborough County Council
R	River Nene Regional Park - River Waveney Trust - RSPB
S	South Cambs District Council - South Norfolk Council and Broadland District Council - South Northamptonshire Council - Southend on Sea Borough Council - Suffolk County Council
T	Tendring District Council - Thames 21 - The Greensand Trust/Upper & Bedford Ouse Catchment Partnership - Thetford River Group - Thurrock Council
U	Upper and Bedford Ouse Catchment Partnership - Uttlesford District Council
W	Water Care Catchment Partnership - Water Management Alliance (IDBs) - Water Resources East - Welland Rivers Trust - Wensum Farmers Group - West Lindsey District Council - West Northamptonshire Council - Witham Humber Drainage Board

4.2 Timeline of engagement

Engagement has followed two streams, either via a planned engagement strategy or more ad hoc as requested. The planned engagement strategy is shown below:



4.3 Launch workshop

In January 2020 we held a day long DWMP launch workshop and invited all our stakeholders to join. Around 50 delegates attended in five discussion groups and we jointly identified:

- Ideal Planning Objectives.
- How best to work together.
- What data was available to share.
- How the DWMP could be structured.
- Lessons learned on previous collaboration experiences.

The discussions held and information gathered from the DWMP launch workshop provided the backbone of the strategic context which was published later that year and can be found on our website or by clicking here.

4.4 Strategic Context

The strategic context (found by clicking the link above), was published in draft on our website in April 2020 and shared via email with stakeholders with a request to respond to the consultation questions. Feedback from the 16 organisations that responded was incorporated where possible, into the final Strategic Context published in October 2020.

4.5 RBCS

In 2020 the RBCS exercise, outlined in 5.3 Risk Based Catchment Screening (RBCS), we identified the water recycling catchments progressing through the DWMP. This list was shared with all stakeholders via email with invitations for comment. Following discussions with stakeholders, an additional catchment previously not identified by the RBCS were added into the DWMP process.

4.6 BRAVA

The BRAVA and problem characterisation stage, outlined in 5.5 Baseline Risk and Vulnerability Assessment (BRAVA), was our opportunity to really identify the risks and concerns for the next 25 years. In summer 2020 we asked to meet our stakeholders in one-to-one meetings to discuss their main concerns and how complicated they thought it might be to resolve them. We asked stakeholders to score out of two (0 = low concern, 2 = high concern) four questions around medium or long term concerns around growth/climate change and system performance for assets in their ownership. We also asked four qualitative questions to understand what data was available to share, if the organisation had any long-term ambitions for that catchment and general catchment information. The responses from these meetings allowed us to focus on catchments which may have a higher risk, complication or greater collaboration opportunities.

4.7 Optioneering

During the optioneering phase we provided two key opportunities for our stakeholders to engage. The first was a presentation followed by area workshops to discuss the generic options we would be using as part of the DWMP. This initial workshop allowed us to identify any L2 differences in solution preferences, which have been fed in as part of the benefits assessment in programme appraisal. Additionally, this first workshop gave stakeholders an opportunity to identify any catchments they'd like to work with us for detailed optioneering.

In autumn 2022 we held a second round of group workshops to focus on the catchments identified as most appropriate for collaborative workshops. In these catchment specific workshops, we discussed the 26 separate catchments, and how we could potentially work together for any solutions over the next 25 years. We also identified a range of partnership working opportunities which are outlined later in 13. Programme outputs

4.8 Customer engagement

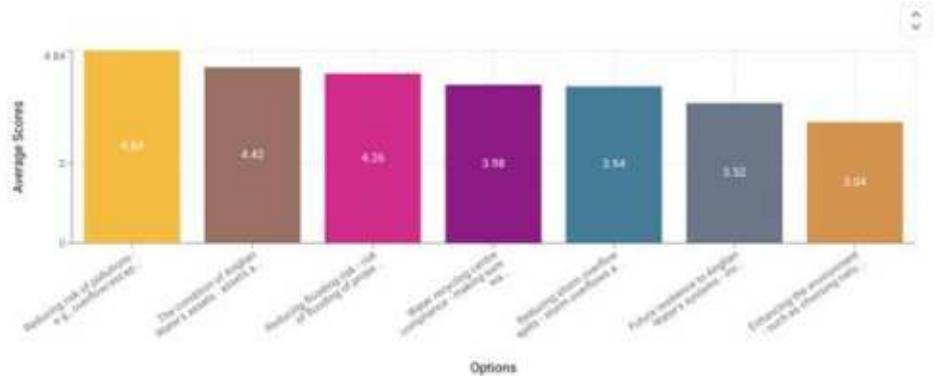
As part of the development of our PR24 Business Plan we are running a series of customer research projects, designed to build upon our existing body of customer insight and to inform the development of our strategic plans (including DWMP). As part of this, we have completed some research specific to DWMP, designed to complement our wider understanding and inform the final DWMP.

Session 1: Customer Priorities

We provided Anglian Water customers some summary information about the DWMP and presented them with a series of survey and open-ended questions to understand which issues and areas for short and long term investments were perceived as most important. Our aim was to explore the areas which customers feel should be prioritised (both in the long-term and short-term) and understand and reasons why customers feel this way.

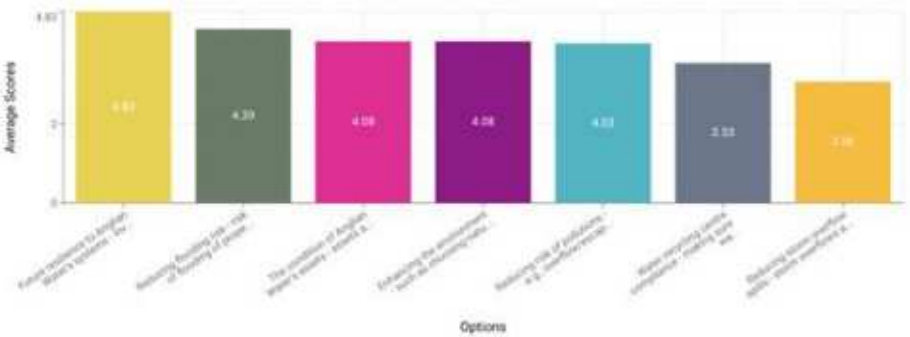
Over 170 customers responded to this survey, and with many customers aware of pollution incidents, the majority felt that reducing risk of pollution (e.g., escape of sewage) is of upmost importance to be addressed. Maintaining our assets was also seen as a high priority, with feedback suggesting that this is due to asset protection would support in incident reduction . Flooding risk reduction is also one of our customers' highest concerns, particularly due to impacts on customer wellbeing and safety.

Figure 6 Customer feedback on medium term risk priorities



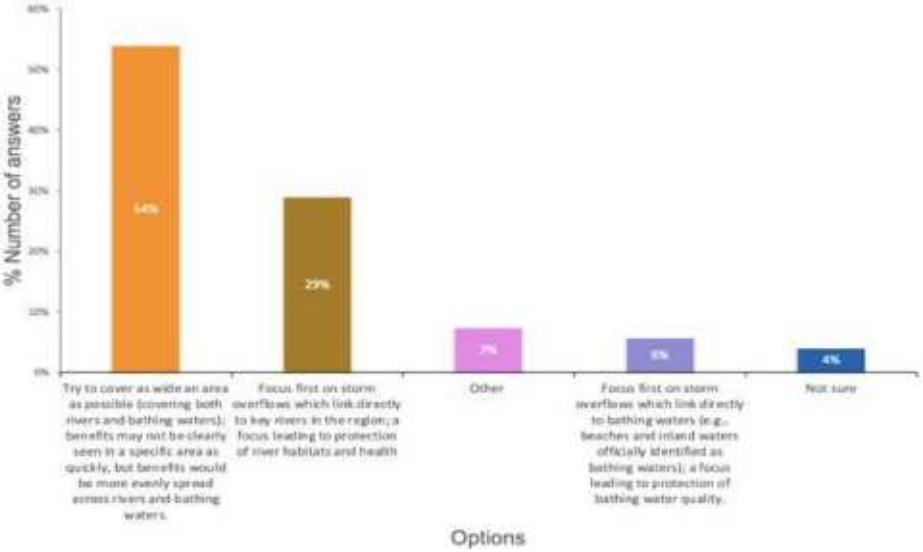
Of all responders, 79% said they would rank the options in the same way for both short-term and long-term. For those who would change their opinion for longer-term priorities, future resilience to Anglian Water's systems was selected as top priority, with flooding risk reduction and asset maintenance remaining in the top three priorities:

Figure 7 Customer feedback on long term risk priorities



We also asked customers about their priorities regarding storm overflows, and customers had a preferred approach regarding our focus on storm overflow improvement targets. 54% of customers indicated that they thought we should cover as wide an area as possible - covering both rivers and designated bathing waters.

Figure 8 Customer feedback on storm overflow prioritisation



However, based on much of the feedback received, many customers found it challenging to choose what to prioritise issues faced for our water recycling systems, and one of the take-home messages for the DWMP was that many of our customers consider all areas to be of equal importance. As such, some customers noted that they would like to see investment across multiple areas, rather than a fixed approach. Our customers feel that due to uncertain times ahead and the threats posed by climate change, all plans need to be adaptable to ensure money is being invested sensibly in areas where it's most needed at any given time.

"At all times I think the plan needs to be flexible and responsive, so that if one area becomes more crucial it can be moved up the priority scale as required." ***45-54. Norfolk***

"all of the options ultimately make a difference to water availability for the future." ***55-64, Bedfordshire***

"I think that all items listed are of equal importance. It is difficult to rank seven items that all need to be considered. I think that Anglian Water has their work cut out to deliver carrying out all items." ***55-64, Essex***

Session 2: Option preferences

We ran a second online session for customers to tell us what they thought about the different solution options for the issues that the DWMP set out to address. We firstly provided an overview of what pros and cons are generally associated with green and grey solutions and asked customers about which type of solutions they would generally prefer to see implemented in the future and why. The vast majority (78%) of respondents (145) said they would choose green solutions, due to an overarching preference for solutions which provide environmental benefit, including climate change mitigation and supporting biodiversity. Respondents generally felt that green solutions are better for the long-term, particularly in light of environmental need, flood and drought risks.

Those who preferred the idea of grey solutions liked the 'tried and tested' methods which are generally cheaper to implement - particularly in the context of the current financial outlook. Overall, feedback indicated that whilst green solutions are beneficial in the long-term, grey solutions have a place in the short term or in more urgent situations. Customers fed back to us that, whilst prioritising green solutions, a mix of green and grey solutions is likely needed.

"Green solutions should be the first choice, but better use of grey solutions must also happen to ensure we do not get overflows into our rivers." ***65-74, Suffolk***

"I believe that ideally green options would be better, but it may be that a combination of the two may work better in some circumstances." ***45-54, Suffolk***

"I prefer 'green' and sustainable solutions although engineered solutions are typically faster to implement." ***55-64, Northamptonshire***

We then gave customers a more detailed view of the specific types of solutions we have to address risks, with descriptive information about each and whether they class as a green or grey (or neither, e.g., customer education) solution. The most preferred options for addressing risks associated with escape from sewers were Rainwater Harvesting, SuDs, Proactive Maintenance and New Wetlands; customers understood how these options could be implemented and the positive impact they would have on our regions. Customers were less confident about the benefits of lower-ranked options, such as infiltration reduction, customer-side management/education and increasing sewer capacity. Customers generally viewed the idea of partnership working as positive, however some expressed uncertainty about how this would work in practise.

Figure 9 Customer solution preference - networks

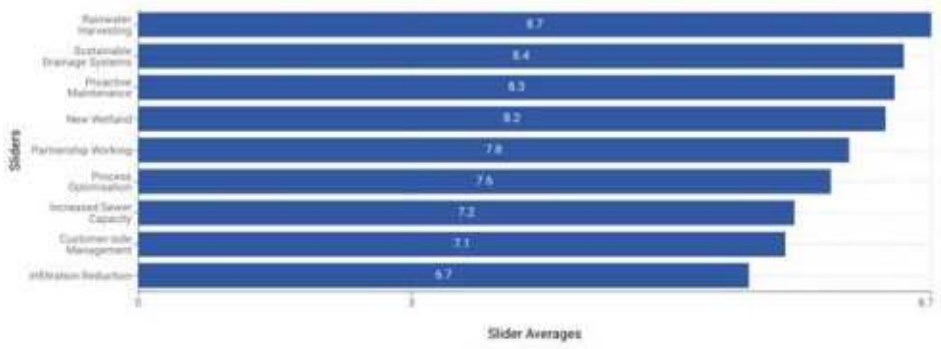
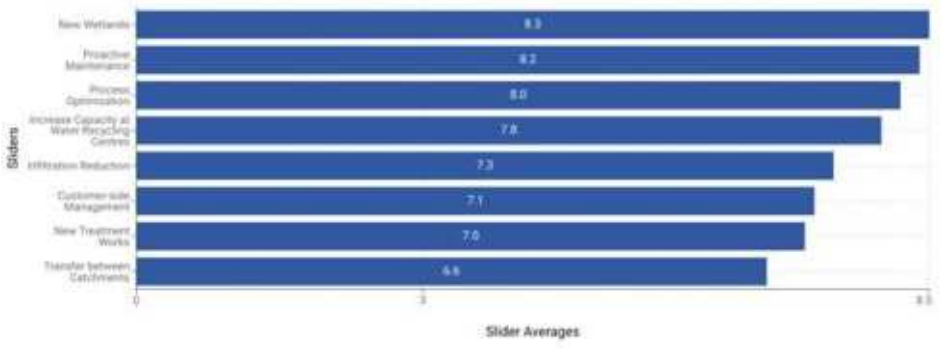


Figure 10 Customer solution preference - WRC



"More of the green options to be more sustainable, rain water harvesting should be one of the first options to help reduce excessive water overwhelming the sewage system." ***35-44, Cambridgeshire***

"I love the idea of new wetlands. Not only attractive but environmentally friendly. Will attract wildlife including birds. Could be a visitor attraction. And it's natural!" ***65-74, Essex***

"I prefer the green option but a combination will more likely be more effective and long term." ***35-44, Cambridgeshire***

"Wetlands where space allows, and where they can cope with the additional water levels, seems to be a win win - more natural water processing, better for the environment than just building more processing plants." ***35-44, Suffolk***

"We need to use all possible solutions in moderation to achieve the improvements required." ***65-74, Norfolk***

"I think all these options need to be integrated based on balancing cost and green/neutral benefits." ***45-54, Norfolk***

"I do not like the idea of building new treatment works or transferring between catchments. These seem like options that are less 'green' and will have negative environmental consequences." ***45-54, Bedfordshire***

The most popular options for managing risks associated with WRC non-compliance were New Wetlands, Proactive Maintenance, Process optimisation and Increasing capacity are our WRCs, with transfer between catchments and building new treatment works being the least preferred options.

Session 3: Storm OverflowsConsultation

As part of our storm overflow plan consultation, we ran a small online video-based focus group with a group of customers from Anglian Water's Knowledge Hub to explore existing awareness and perceptions around storm overflows and gauge existing confidence levels in our

capability to meet storm overflow targets set by Defra. Further, we wanted to understand customer preferences for how, when and where Anglian Water plan to meet these targets.

Although the customers in the focus group felt that they didn't have a lot of in depth knowledge about storm overflows, increased press coverage has led them to recognise storm overflows as a dangerous and toxic. This leads to two key topics for concern: Health of the public - especially for those who spend time in the water - and environmental and wildlife welfare (e.g., fish deaths).

These perceptions are driven by:

- Recent and regular negative press on the issue
- Being a environmentally conscious customer
- A lack of widely shared knowledge and contextual information around why storm overflows are used; many opinions are based on what is seen or heard from media sources

"[I have] opinions rather than a lot of knowledge, but I think locally in your local papers and in the media, [you see reports] on storm overflows going into rivers and things like that, and it basically just not being a good thing. then you see all these groups of people wild swimming and you wonder what it's doing to people." ***32, Lincolnshire***

Supply and demand is another concern for our customers; a conclusion drawn from this session was that providing customers with more information around storm overflow use - particularly around the reasons for their use (e.g., flood prevention), under what circumstances we can't or don't reuse storm water, and the work that Anglian Water has done/is doing to reduce stormwater overflow usage.

In response to the Defra Storm Overflow guidance, our customers said that they were receptive to the overflow targets set by Defra and are generally confident that Anglian Water will meet the deadlines and fulfil requirements.

One area of concern is a perceived lack of context around what is being done to meet the targets and how achievements are measured (e.g., what is ecological impact?).

Our customers are fully supportive of reducing spill frequency at our storm overflows; however, although they view this as a step in the right direction, they would like to see us increase our targets (reducing more spills than the targets set out, with a zero spills aim) and to hit these targets sooner.

Similarly to our previous sessions, customers understood pros and cons to both grey and green type solutions and recognised that grey solutions will always have a place in water recycling, with greener solutions not always being appropriate. While newer and greener solutions are desirable, customers understand that they have their own limitations and that a blend of green and grey solutions will be necessary to sufficiently address our storm overflow targets.

4.9 Draft DWMP

Published on the 30 June 2022 the draft DWMP was open for consultation for 11 weeks until the 16 September 2022.

In February 2023 we released our draft Storm Overflow Reduction Plan for a three week consultation.

In November 2022 we published an open letter summarising the key themes of our draft DWMP consultation feedback. A full report of the feedback from both consultations, and our responses, can be found in the Statement of Response. Both the open letter, and the statement of response, are published on our website.

5. Plan development

Our Strategic Direction Statement (SDS) outlines our ambitions and as a company we are not new to strategy planning, having produced the Water Resources Management Plan (WRMP) for a number of cycles as well as producing the industry first Water Recycling Long Term Plan alongside our business plan at PR19. Because of this we already have highly effective processes in place to support us through strategic planning. Throughout the creation of the DWMP we have followed the framework to guide us in the right direction to achieve each task and used our existing processes where appropriate.

5.1 Strategic context

The creation of the Strategic Context with our stakeholders gave us the direction for the DWMP to focus on. The main output of this were the 10 planning objectives outlined below.

Planning objectives are a list of measures on which existing and future risk were assessed against.

These risks were agreed with stakeholders, at a workshop and then through to strategic context consultation. They are used in the BRAVA stage to understand the level of risk a catchment holds, and how complicated it might be to mitigate that risk. They only apply to catchments which have proceeded through the RBCS stage.

Planning objectives are expected to reflect the company and stakeholder strategic goals and are used to drive the direction of the strategies. They make sure we continually push to improve our catchments and, for Anglian Water, to meeting our four Strategic Direction Statement (SDS) ambitions and 10 outcomes. Some of these reflect our performance commitments which provide significant contributions to the achievement of outcomes outlined in the section above. Other performance commitments relate to risks that our stakeholders see as important.

To make sure our DWMP focused on the most appropriate risks, not all L3 catchments were assessed against all planning objectives. The 10 planning objectives were split into three themes:

1. Escape from sewers.
2. WRC performance.
3. Environment and wellbeing.

Where the RBCS flagged a potential concern for one of the planning objectives then that L3 was assessed against all the planning objectives in that theme.

Our planning objectives are outlined below:

Table 5 Planning Objectives

SDS Ambitions *What are we ultimately trying to achieve across the region*	Outcome *How does it track back to our outcomes*	Planning objective *What are we measuring*	Theme *What group does this fit in?*
Resilient to the risks of flooding Enable sustainable economic and housing growth Be a carbon neutral business by 2030 Work with others to achieve significant improvement in ecological quality	Resilient business	Risk of sewer flooding in a 1 in 50 year storm	Escape from sewers
	Flourishing environment	Storm overflow performance	
	Investing for tomorrow	External sewer flooding risk	
	Delighted customers	Internal sewer flooding risk	
	Flourishing environment	Pollutions risk	
	Investing for tomorrow	Sewer collapse	
	Investing for tomorrow	DWF Compliance	WRC Compliance
	Investing for tomorrow	Quality compliance	
	Delighted customers	Access to amenity areas	Environment and wellbeing
	Flourishing environment	Green infrastructure	

Planning Objective definitions

Risk of Sewer Flooding in a 1 in 50 year Storm
1 in 50 design storm event, which equates to a 2% probability of the rainfall event occurring in any given year.
Storm Overflow Performance
The number of spills from Storm Overflows (SOs)
External Sewer Flooding Risk
The number of outside areas within a boundary curtilage flooded by water from our sewers.
Internal Sewer Flooding Risk
The number of flooding incidences from our sewers within properties,
Pollutions Risk
Number of pollution incidents classed as Category 1-3 by the Environment Agency.
Sewer Collapses
Number of sewer collapses.
Dry Weather Flow (DWF) vs permitted DWF.
Percentage of measured DWF vs permitted DWF
WRC Quality Compliance
Compliance with the environmental obligations outlined as the sanitary standards in the permit.
Access to Amenity Areas
Amenity of land within a catchment.
Green infrastructure
The level of green infrastructure within a catchment.

It was important that the Planning Objectives all met a set list of criteria:

- Have customer and/or stakeholder support,
- Are clear and understandable,
- Have performance thresholds that can be modelled and measured,
- Are consistent with Ofwat performance commitments,
- Contribute to long-term water recycling strategies.

Members of the WaterUK DWMP steering group agreed that all water companies should include six common planning objectives. These were:

1. WRC quality compliance
2. Storm overflow performance
3. Sewer collapses
4. Internal sewer flooding
5. Risk of flooding in a 1 in 50 storm
6. Pollution risk

Above the nationally agreed planning objectives, we worked with our stakeholders to create a list which met both our strategic goals and the criteria above. This led to an additional four planning objectives:

1. WRC Dry Weather Flow (DWF) compliance
2. External sewer flooding
3. Amenity value
4. Green infrastructure

To make sure we had consistency across all organisations, we held working groups to create a process to assess the six common objectives shown above. And you can see the method for all the planning objectives below.

Table 6 Planning Objectives

Planning Objective	Definition	Baseline assessment	2050 assessment	Assumptions and clarifications
WRC quality compliance	Covers treatment works compliance as set out in Environmental Performance Assessment (EPA) at wastewater assets only. Excludes Water Treatment Works (WTWs) and WRCs with descriptive permits.	The baseline performance is based on an assessment of modelled WRC treatment capacity. Where a WRC model is not available three years of historic performance data is used to produce a projection of compliance. It considers compliance with current permit only.	Same methodology as Baseline Assessment with the model taking into account updated population, flow and load projections. As well as any updated permit conditions where there is a committed permit change in AMP7. Where there is no model, a factor should be applied to the trend analysis to account for growth.	WRC assets and condition remain the same between 2020 and 2050. Receiving water quality remains the same and does not trigger permit changes unless already confirmed in AMP7. The approach for how climate change will impact this will be developed with stakeholders in advance of the next plan.
Storm overflow performance	The definition of storm overflow will include both sewer network and WRC storm tanks. Annual average spills are calculated using the Event Duration Monitoring (EDM) criteria of '12/24 spill counting'.	EDM data should be used and where an overflow did not trigger the need for EDM (under the EDM assessments due to low spills/low impact), then the default performance should be 'Not Significant' under baseline.	An appropriate adjustment should be applied to baseline EDM spill data. As a default this should use appropriate uplifts based on the 2017 UKWIR REDUP rainfall perturbation tool (e.g. if the REDUP tool indicates a 15% uplift in rainfall then the default assumption will be that spills will also increase by the same value) unless catchment characteristics deem this approach is not representative.	Where catchments have no storm overflows or WRC storm tanks, then catchments should be flagged as 'Not Applicable' The assessment excludes receiving water quality, amenity use and dilution.

Planning Objective	Definition	Baseline assessment	2050 assessment	Assumptions and clarifications
Sewer collapses	The definition of the measure is in accordance with the Ofwat reporting guidance for sewer collapses. It includes rising mains, pipe bridges and failures on the infrastructure network, including inlets to WRCs and terminal pumping stations.	Performance is based on best available historical data, and will use an average of last three years of annual performance.	Not applicable. Only reviewed baseline risk.	
Internal sewer flooding	As per the Ofwat reporting criteria it covers internal sewer flooding due to hydraulic incapacity and other causes (e.g. blockages, collapses and equipment failure). It excludes: Non-sewer related flooding such as privately owned sewerage, fluvial, pluvial (except where linked to the incapacity of a sewer), land drainage, Highway drainage and private drains.	Modelled hydraulic risk with an allowance for other causes based on at least one year of reported data.	Modelled hydraulic risk with a projected view of risk from other causes.	
Risk of flooding in a 1 in 50 storm	It is consistent with the annual reporting for the Ofwat common resilience performance commitment. The approach is in accordance with the guidance set out by Ofwat, with the addition of including all catchments regardless of size.	As set out in the Ofwat guidance: https://www.ofwat.gov.uk/wp-content/uploads/2019/04/Reporting-guidance-Risk-of-sewer-flooding-in-a-storm_final_290319.pdf	Same methodology as baseline assessment with growth and creep to be added in, and rainfall uplifted to include climate change.	
Pollution risk	Covers pollution incidents as set out in Environmental Performance Assessment (EPA) relating to wastewater assets only and thus this measure will exclude non-sewer related pollutions such as water treatment/supply assets, third party private assets. This includes sewerage infrastructure, including pumping stations, WRC and sludge/biosolids incidents. Comprising other causes (i.e. blockages, collapses and equipment failure) and those caused by hydraulic overload (i.e. sewer	The baseline performance is based on best available model data. Where a suitable model is not available, an average of last three years of annual performance is used.	Modelled risk with a projected view of risk from other causes.	

Planning Objective	Definition	Baseline assessment	2050 assessment	Assumptions and clarifications
	overflows operating outside permit conditions or due to overland rainfall induced pollution). It only includes serious pollutions (formerly category 1 and 2) and category 3 incidents (aligned to RBCS). All pollutions counted equally for the purposes of this measure.			
WRC DWF compliance	Assessment of the measured or predicted Q90 DWF against the permitted DWF.	Review of one year reported DWF against permitted DWF	Forecasted DWF using the Environment Agency Guidance published in May 2018	Assumes permit remains the same unless already confirmed in AMP7.
External sewer flooding	It covers external sewer flooding due to hydraulic incapacity and other causes (e.g. blockages, collapses and equipment failure).	Modelled hydraulic risk with an allowance for other causes based on at least one year of reported data.	Modelled hydraulic risk with a projected view of risk from other causes.	
Green infrastructure	Review of green infrastructure (balance ponds and/or surface water only pipes) within a catchment	Review of the percentage split of pipe type between combined/foul/surface, joined with a count of balance ponds		Assumes no change across the 25 year period
Amenity value	Review of greenspace as a percentage of the catchment	Spatial maps assessed to understand the percentage of greenspace within a catchment	Growth polygons added into the spatial maps to review the percent change.	

5.2 Understanding the risk

During 5.5 Baseline Risk and Vulnerability Assessment (BRAVA)we assessed all the planning objectives and then categorised them into bands of 0, 1 and 2; with 0 being 'Not Significant', 1 being 'Moderately Significant' and 2 being 'Very Significant'. The thresholds for these band levels were based on performance commitments, where relevant, or an acceptable level of risk.

For some planning objectives the results were normalised to allow direct comparisons across catchments. Where thresholds are based on performance commitments the 2024/25 Standard Outperformance Cap was used as the lower threshold, with the 2024/25 Standard Underperformance Collar used as the upper threshold.

Table 7 Understanding the Risk

Planning objective	0	2	Normalisation	Rationale
Internal sewer flooding	<0.01	>3.35	Per 10,000 connections	Ofwat PR19 performance commitment
External sewer flooding	<28	>83	Per 10,000 connections	Ofwat PR19 performance commitment
Pollution incidents	<4.5	>36.76	Per 10,000km of sewer	Ofwat PR19 performance commitment
Sewer collapse	<5.5	>7.76	Per 1,000km of sewer	Ofwat PR19 performance commitment
Risk of sewer flooding in a 1 in 50 year storm	<5.5	>9.75	% of population at risk	Ofwat PR19 performance commitment
Storm overflow performance	<20 or <3 where bathing or shellfish water	>40 or >10 where bathing or shellfish water	Based on the highest spilling overflow in the catchment.	CAF methodology
WRC quality compliance	PE < 85% biological capacity and/or no current performance issues	Predicted population >95% biological capacity and current performance issues	N/A	Agreed risk level
WRC DWF compliance	Predicted DWF <85% of permit	Predicted DWF >95% of permit	N/A	Agreed risk level
Amenity areas	>5% greenspace	<2% greenspace	N/A	Agreed risk level
Green infrastructure	>50% foul and <25% combined sewers	>50% combined only sewer, and <20 balance ponds	Balance ponds per 1,000km sewer	Agreed risk level

5.3 Risk Based Catchment Screening (RBCS)

Following the strategic context, the RBCS is the process where we review all of our catchments to make sure we are focusing our efforts in the right place. This screening exercise was completed in 2019 and we have reviewed the list since to make sure we're capturing the risks correctly.

The framework focuses on 17 suggested measures to review each L3 water recycling catchment against. We used all 17 measures and added two more. The measures are mainly water company focussed and based on historic performance. All 19 measures used are listed below, and were classed as Tier 1 or Tier 2; Tier 2 are marked in bold.

- **Wastewater resilience metric catchment characterisation**
- Intermittent discharge impacts upon bathing or shellfish waters
- Continuous or intermittent discharge impacts upon other sensitive receiving waters (part A)

- **Continuous or intermittent discharge impacts upon other sensitive receiving waters (part B)**
- Storm Overflow Assessment Framework (SOAF)
- Common Assessment Framework (CAF)
- Internal sewer flooding
- External sewer flooding
- Pollution incidents (category 1, 2 and 3)
- WRC quality compliance
- WRC DWF compliance
- Storm overflows
- Risks from interdependencies between Risk Management Authorities (RMA) systems
- Planned residential new development
- The Water Industry National Environment Programme (WINEP)
- Sewer collapses
- Sewer blockages
- WRC biological capacity
- WRC descriptive permit

Each measure was assessed against a trigger metric, as outlined in the framework, and shown below. For a catchment to pass through the DWMP process it needed to meet the trigger of at least one Tier 1 assessment, or two or more measures (regardless of tier status). If a catchment only breached on sewer collapses and/or blockages, then this was treated as information only and as per framework guidance the catchment did not proceed further through the DMWP process (39 catchments).

We put 1,130 water recycling catchments through RBCS, with 617 meeting the triggers to pass through to the next stage of the DWMP process. This equated to 55% of our water recycling catchments, however these catchments cover 97% of the household population we serve.

The list was shared with our stakeholders, who had the opportunity to review and comment on the suitability of discounting any catchment. Following these discussions another catchment was added into the DWMP process. Totally 618 catchments passing forward through to the next stage of the DWMP.

Measure and trigger details

The following section outlines the details of the 19 measures and indicates how many times that measure was triggered by a catchment.

1. **Wastewater resilience metric catchment characterisation**

Tier: 2

Goal: To understand the catchment's risk of sewer flooding from an extreme weather event.

Assessment: Catchments were hydraulically modelled against a 1 in 50 storm. Where this was not possible an extrapolation was made using information already known.

Trigger: Population associated with flooding >14.5% of the catchment.

Number of catchments triggered: 526

2. **Intermittent discharge impacts upon bathing or shellfish waters**

Tier: 1

Goal: To understand the significance of any impact of water company operations on environmental receptors, such as bathing or shellfish waters.

Assessment: On overflows with a spill frequency trigger permit condition by 2020. Spill count from Event Duration Monitors (EDM) where they are in place or an assessment based on historical 2005-15 spill data from non EDM standard overflow monitors. Overflows without the permit condition were passed. A catchment is triggered if any of the overflows in the catchment meet the trigger criteria.

Trigger: Spill count >5 times a year

Number of catchments triggered: 20

3. **Continuous or intermittent discharge impacts upon other sensitive receiving waters (part A)**

Tier: 1

Goal: To understand the significance of any impact of water company operations on environmental receptors.

Assessment: Review of list versus our current WINEP programme.

Trigger: Catchment features as a 'Remedy' on Natural England's Designated Sites system relating to improving or maintaining the condition of a SSSI, Natura 2000 or Ramsar site and/or included within the Nutrient Management Plan and/or a diffuse water pollution plan. Where improvements not completed prior to DWMP base year to address the issues.

Number of catchments triggered: 0 (N.B. our WINEP programme in AMP7 addressed all risks).

4. **Continuous or intermittent discharge impacts upon other sensitive receiving waters (part B)**

Tier: 2

Goal: To understand the significance of any impact of water company operations on environmental receptors.

Assessment: Review of list vs our current WINEP programme.

Trigger: Catchment features as a 'Threat' on Natural England's Designated Sites system relating to improving or maintaining the condition of a SSSI, Natura 2000 or Ramsar site. Where improvements not completed prior to DWMP base year to address the issues.

Number of catchments triggered: 0 (N.B. our WINEP programme in AMP7 addressed all risks).

5. **Storm Overflow Assessment Framework (SOAF)**

Tier: 1

Goal: To understand if there are any potential future storm overflow concerns.

Assessment: SOAF assessment.

Trigger: A SOAF investigation is planned for any of the storm overflows in the catchment.

Number of catchments triggered: 48

6. **Common Assessment Framework (CAF)**

Tier: 1

Goal: To provide an indication of capacity constraints in the network.

Assessment: CAF assessment focuses on the 'present day' case. 10km hexagons are scored between 1-5 based on risk.

Trigger: Any 10km hexagon covering the catchment that is categorised as 4/5 (due to performance, in full or part, within the catchment being assessed).

Number of catchments triggered: 74

7. **Internal sewer flooding**

Tier: 1

Goal: To provide an indication of capacity constraints in the network.

Assessment: Internal sewer flooding count. For catchments >2,000PE the catchment flooding was also compared against the company average.

Trigger: Varied depending on the size of the catchment. >1 internal sewer flooding incident in total over the past three years with no mitigation completed. For catchments >2,000PE the flooding in any of the previous three years also had to be greater than company average.

Number of catchments triggered: 12

8. **External sewer flooding**

Tier: 1

Goal: Historical measure aligned with PR19 performance commitment.

Assessment: External sewer flooding count. For catchments >2,000PE the catchment flooding was also compared against the company average (per 10,000 connections).

Trigger: Varied depending on the size of the catchment. >10 external sewer flooding incidents in total over the past three years with no mitigation completed. For catchments >2,000PE the flooding in any of the previous three years also had to be greater than company average.

Number of catchments triggered: 33

9. **Pollution incidents (category 1, 2 and 3)**

Tier: 1

Goal: Historical measure based on previous environmental impacts.

Assessment: Based on the 2017 definition in the Environmental Performance Assessment (EPA) data and thresholds.

Trigger: A category 1 or 2 incident occurred in the past three years. Or the catchment has an average performance assessment of amber or red. Or for catchments where only category 3 incidents have occurred, and no mitigation delivered.

Number of catchments triggered: 140

10. **WRC quality compliance**

Tier: 1

Goal: Historical measure based on previous performance of WRCs against their numeric permit limits.

Assessment: Based on the 2017 definition in the Environmental Performance Assessment (EPA) data and thresholds.

Trigger: If the WRC has been confirmed as failing at any point in the past three years and mitigation is not put in place.

Number of catchments triggered: 23

11. **WRC flow compliance**

Tier: 1

Goal: Historical measure based on previous performance of WRCs against their flow permits.

Assessment: Measured flow data against permitted dry weather flow (DWF).

Trigger: Measured DWF > permitted DWF for at least three out five previous years.

Number of catchments triggered: 63

12. **Storm overflows**

Tier: 1

Goal: Understand any storm overflow risks which are not captured by the other measures.

Assessment: Any assessments of storm overflows against their permit and a review of spill triggers in the SOAF.

Trigger: Permit conditions not being met, or storm spills expected to breach SOAF spill count.

Number of catchments triggered: 26

13. **Risks from interdependencies between Risk Management Authorities (RMA) systems**

Tier: 1

Goal: Understand any risks from RMA assets in the catchment.

Assessment: A review of known risks from RMA assets based on conversations and data from our RMA partners.

Trigger: A risk identified with no investment planned to mitigate.

Number of catchments triggered: 134

14. **Planned residential new development**

Tier: 1

Goal: Understand which catchments require investigations for future capacity constraints due to increase residential population.

Assessment: Increase in population against thresholds as set out in the framework. Thresholds vary depending on the size of the catchment.

Trigger: Population increase > threshold.

Number of catchments triggered: 95

15. **WINEP**

Tier: 1

Goal: Understand which catchments have WINEP measures identified.

Assessment: Review of AMP7 WINEP list.

Trigger: WINEP investigation in catchment.

Number of catchments triggered: 56

16. **Sewer collapses**

Tier: 1

Goal: Historical measure to identify the integrity of the sewer system.

Assessment: Dependant on size of catchment. <2,000PE sewer collapses were based on a count. >2,000PE sewer collapses were normalised and compared to the company average.

Trigger: <2,000PE catchment >two collapses in any of past three years. >2,000PE catchment >company average in any of the past three years.

Number of catchments triggered: 123

17. **Sewer blockages**

Tier: 1

Goal: Historical measure that records obstructions in a sewer (that require clearing) which causes a reportable problem.

Assessment: Number of blockages in the catchment normalised against sewer length and compared to company average.

Trigger: Normalised sewer blockages > company average in any of the past three years.

Number of catchments triggered: 102

18. **WRC biological capacity**

Tier: 1

Goal: Understand the design capacity and performance of the WRC.

Assessment: Design capacity of WRC against population, along with a review of any fails against look up table (LUT) or urban waste (UW) permit.

Trigger: Population > 95% of WRC capacity and at least one fail against permit in the past three years.

Number of catchments triggered: 95

19. **WRC descriptive permit**

Tier: 1

Goal: Understand catchments where WRC may need a numeric permit in the future.

Assessment: Review of descriptive permits against population.

Trigger: WRC has a descriptive permit and >250 population with no investigation or investment planned.

Number of catchments triggered: 7

Screening

Any of the 618 catchments that triggered at RBCS based on one measure only were reviewed prior to moving into full BRAVA. In total 323 catchments fell into this category.

Table 8 RBCS one trigger screening process

Tier 1 fail	Process	Catchments reviewed
CAF	1. Understand the cause of the flooding. 2. Understand if it will be resolved before 2025. 3. If no, seek stakeholders view of the catchment.	29
Internal sewer flooding	1. Understand the cause of the flooding. 2. Understand if it will be resolved before 2025. 3. If no carry out full modelling.	3
External sewer flooding	1. Understand the cause of the flooding. 2. Understand if will be resolved before 2025. 3. If no carry out full modelling.	1
Pollution incidents	1. Understand the cause of the pollution incident. If it was a one off with a known and resolved cause then no modelling is required.	12

Tier 1 fail	Process	Catchments reviewed
	2. Understand if it will be resolved before 2025. 3. If no carry out full modelling.	
WRC compliance	1. Understand the cause and regularity. If the cause is known cause and there is funding to resolve then no modelling is required. 2. Seek stakeholders view of the catchment. If there are no issues then only network modelling is needed. If there are any issues then full modelling is needed.	2
DWF compliance	1. Understand if it will be resolved before 2025. 2. If no then look at for flows that are unaccounted for. 3. Get stakeholders view of the catchment	37
RMA	1. Confirm with stakeholders if the catchment is a concern for the 25 year period. If yes then full modelling is needed.	15
Growth	1. Review the growth data to ensure development sites are assigned to the correct catchments. 2. Where risk remains, seek stakeholders view of the catchment	11
WINEP investigation	1. Understand how and why this fits into the WINEP. 2. Seek stakeholders' views of the catchment	183
WRC biological capacity	Seek stakeholders view of the catchment · If stakeholders are concerned, full modelling is required.	27
WRC with descriptive permits and PE>250	Follow the separate business as usual process	3

Following the pre-screening of 618 catchments, 43 were removed from the DWMP process. The total number of catchments which progressed through BRAVA was 575.

5.4 Resilience

We completed a resilience assessment on all of our water recycling catchments, regardless of whether a catchment was triggered to pass through the DWMP process or not.

We scored each of our catchments out of two, with two being the highest risk for resilience issues. We used two measures to understand the resilience risk. The first was if the catchment had an asset identified as being at risk from fluvial (river), pluvial (rain) and coastal flooding. The second was if the catchment had a response recovery plan in place.

The assessment of fluvial, pluvial and coastal flooding looks at the risk of flooding in a range of scenarios up to a 1 in 1000 year storm. Our response recovery plans are put in place where assets are considered critical to our business.

Spotting a resilient risk meant there might be a concern. But making sure our assets are resilient to risks is business as usual for us so we have not provided any solutions to address this as part of the DWMP.

We have since completed further resilience assessments to get an updated view of the fluvial, pluvial and coastal flooding, using the most up to date climate change projections. This is outline more in 9. Resilience

5.5 Baseline Risk and Vulnerability Assessment (BRAVA)

BRAVA takes the catchments identified through the RBCS and tests them against future pressures to understand the risks. Catchments were reviewed against the planning objectives as agreed in the strategic context.

BRAVA allowed us to understand how the risk to planning objectives changes over the next 25 years if no interventions occur. We assessed this over a period of time, starting from a 2020 baseline and moving to what are called planning horizons in 2025, 2030, 2035 and 2050. Risk was assigned a score of 0 = low risk, 1 = medium risk or 2 =high risk. We assessed this for each level 3 water recycling catchment which moved through our DWMP process. These were then aggregated to create a level 2 picture which was shared with our stakeholders in December 2020. The level 3 assessment of BRAVA scores can be found on our online DWMP, or if you prefer you can view the BRAVA results at your preferred level 2.

We took a proportioned approach to this risk assessment and identified what the main triggers were from the RBCS. Where a water recycling catchment only triggered one RBCS risk, we investigated it further before progressing through the DWMP. Where a catchment only triggered on the RBCS for risks associated with the WRC (such as WRC quality compliance, WRC flow compliance, biological capacity and descriptive permits), then escape from sewers planning objectives were not assessed. Where any other risks were highlighted during the RBCS stage then all planning objectives were assessed during the BRAVA phase.

BRAVA - Escape from sewers

Five planning objectives fall into the Escape from sewers assessment group.

Storm overflow performance

During production of the DWMP, we were installing Event Duration Monitors (EDMs) at our storm overflows. Data from the monitors was used to record the performance of the overflows, using the 12/24 spill count method as outlined in the CAF approach. Due to the infancy of the EDM data, we only used one year as the assessment. We therefore took a worst case view of assessing the catchment. Where a water recycling catchment had more than one overflow, we took the score from the overflow with the highest spills; so, if there were two overflows, with one scoring 0 and one scoring 2, the level 3 catchment was scored as a 2.

At the time of assessment, we had EDM monitors on 620 of our circa 1,500 overflows within 277 of our DWMP level 3 catchments. This has since increased, and we will have full coverage by the end of 2023.

Using EDM data allowed us to easily assess the baseline risk. To understand the 2050 future risk, we modelled a number of catchments to understand the spill increases likely to be seen. On average, modelled spills increased by 36% by 2050. We therefore applied a 36% uplift on the spill numbers seen from the baseline data and re-assessed the scoring. Again, we took the worst spilling overflow to create the score for the level 3 catchment.

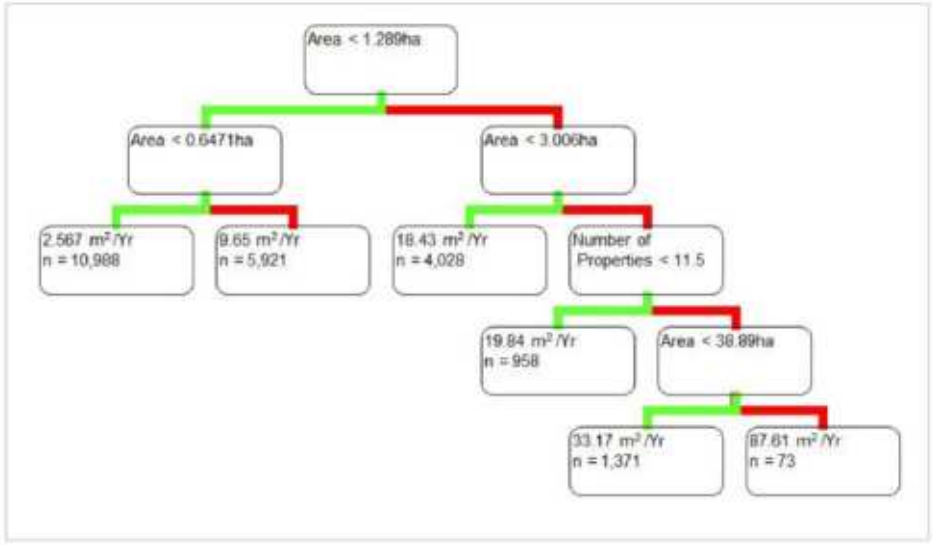
This initial assessment was completed prior to the release of the Storm Overflow Discharge Reduction Plan. A more detailed review of risk has been completed to meet these targets. This is outlined in 5.9 Storm overflows.

External and Internal sewer flooding risk and Pollution risk

We completed 2D hydraulic modelling using the most recent catchment model to understand the hydraulic overload risk of flooding and pollution. The FEH 2013 Design Rainfall storm scenarios were used, looking at M5-60, M5-240, and M5-480 duration with and without climate change. The Flood Estimation Handbook (FEH) and supporting materials provides industry standard methods for assessing flood risk in the UK. It offers guidance on the estimation of rainfall and river flood frequency and development site runoff rates across the UK.

Creep (the increase in flow from removal of permeable surfaces) was applied to the model based on the population density of the sub-catchment. The additional number of years creep between the baseline and the relevant design horizon was added. The volume applied followed the regression tree methodology as outlined below.

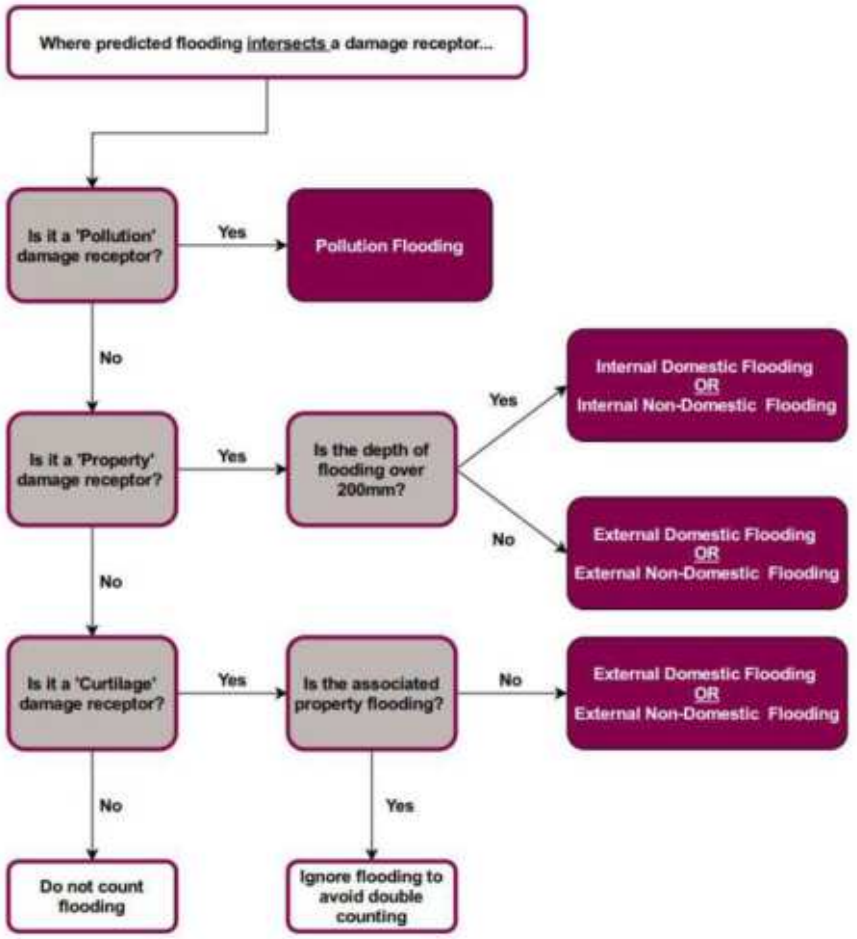
Figure 11 Regression tree methodology



Growth was added into the model, connecting a development site to a manhole and profiling the rate of the growth over the development period. As per our model specification, the development was converted to a flow using: an occupancy factor of 2.35, an increase of 5m2 per property of creep, a baseflow of 25% daily flow using the population and per capita consumption rate of 125l/h/d.

Once the scenarios were run, the model was exported and run over a damage receptor layer to identify the points of impact, whether this would be internal or external flooding or a pollution. Internal flooding was counted where flooding was predicted to be above the 200mm threshold. External flooding was where any depth intersected the property boundary or curtilage. To avoid double counting a property was not counted as both internal and external flooding. Pollution was counted when any depth of flooding intersects a pollution receptor. The process to identify this is shown below:

Figure 12 Flooding categorisation map



The modelling identified the risk due to hydraulics. To ensure we also captured risk from other causes we reviewed the hydraulic:other causes split per catchment for the reported flooding and pollution data from 2019. It is hard to identify how flooding or pollution caused by other causes will change with time. We took the approach that, unless zero hydraulic flooding or pollutions had been reported, the percentage for other causes would remain the same. That is if the current ratio was 50:50 hydraulic:other causes then we would take the modelled number and add on 50% for other causes.

Risk of flooding from a 1 in 50 year storm

We completed 2D hydraulic modelling using the most recent catchment model to understand the hydraulic overload risk for a 1 in 50 year storm. The FEH 2013 Design Rainfall storm scenarios were used, looking at M50-60, M50-240, and M50-480 duration with and without climate change. The Flood Estimation Handbook (FEH) and supporting materials provides industry standard methods for assessing flood risk in the UK. It offers guidance on the estimation of rainfall and river flood frequency and development site runoff rates across the UK.

As with the flooding and pollution model, the results were then run through a damage receptor layer to identify the points of impact.

Sewer collapse

Sewer collapses was reviewed at baseline only to provide an indicator of the risk we hold in each catchment. We used our reported 2019 sewer collapses data to provide BRAVA scores.

BRAVA - WRC Compliance

Two planning objectives fall into the WRC compliance assessment group: WRC quality compliance and WRC Dry Weather Flow (DWF) compliance.

WRC quality

All our WRCs are individually designed to serve a particular population to the required standard.

We use a ‘common assessment tool’ to understand what the WRC has been designed to treat and the size of the population it can serve. This assessment uses the measurements of the tanks and engineering design standards. The result of the assessment is the design capacity of the WRC and gives us an indication of the population which will cause impact on the WRC's performance. The future population numbers were compared against the calculated design capacity at each planning horizon (2025, 2030, 2035 and 2050).

Since the design common assessment only gives us an indication of the level of population which may cause a concern, we also reviewed the WRCs most recent ammonia performance data to get a baseline risk score. Performance of a WRC can be impacted by many factors, therefore we carried out three statistical assessments on the data. To ensure we didn’t miss anything, we took the worst assessment as our ‘baseline’ score.

The score from both the WRC capacity and the performance assessments were then combined. Where both assessments showed a high risk, these catchments scored a 2. Where either the design capacity was <85% of the population at the time horizon, or the current performance was low risk, the catchment scored as 0.

WRC DWF compliance

Our growth forecast includes a prediction of DWF; the details of this are outlined in 5.6 Forecasting growth The forecasted Q90 was compared to the current consented DWF at each of the time horizons. Catchments were scored as outlined in 5.2 Understanding the risk

BRAVA - Environment and well-being

Two planning objectives fall into the environment and wellbeing assessment group: access to amenity areas and green infrastructure.

Amenity areas and green infrastructure

The greenspace in each catchment was assessed using geospatial mapping. Greenspace was classed as any non-urbanised area such as a field, park, nature reserve, cemetery, woodland. It did not include gardens.

Extended BRAVA

Following the framework an additional assessment was carried out on a number of sites to review their sensitivity to growth. To understand which catchments would go through we reviewed the BRAVA scores against the confidence we had in the growth forecast. Where we had the least confidence in the growth and the highest risks identified, they were assessed again using the same processes but with +/- 30% population growth figures to understand their sensitivity. These were called extended BRAVA catchments.

5.6 Forecasting growth

We understand that growth is one of the biggest challenges for us - and one of the areas where we can do most to support our customers and our region. That's why we have set out a strategic ambition to enable sustainable economic and housing growth in our SDS.

We produce robust future forecasts of both housing and population growth in our region, using the best available planning information.

The heat maps below illustrate the growth in our region to 2027 and long-term to 2045. A darker red indicates more growth in that area.

Figure 13 Growth to 2027

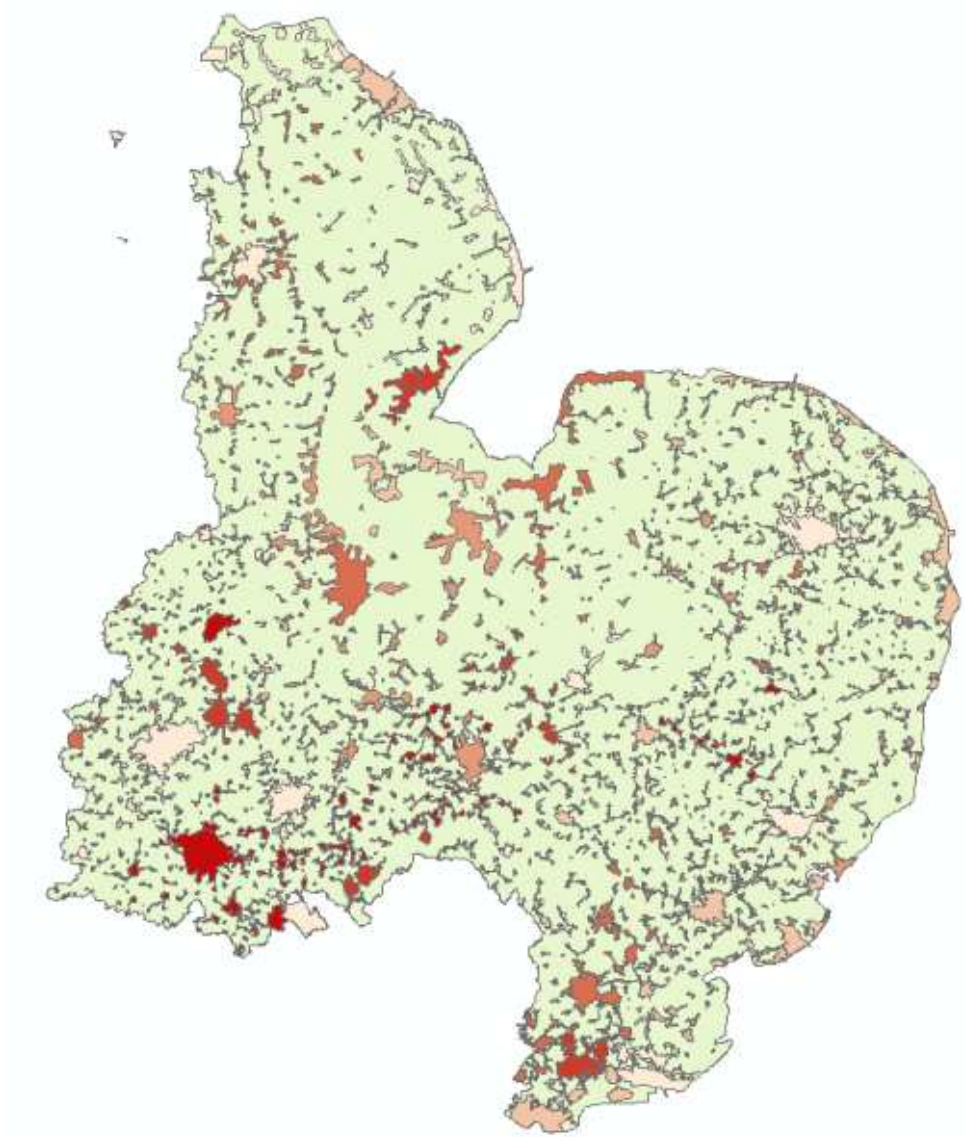
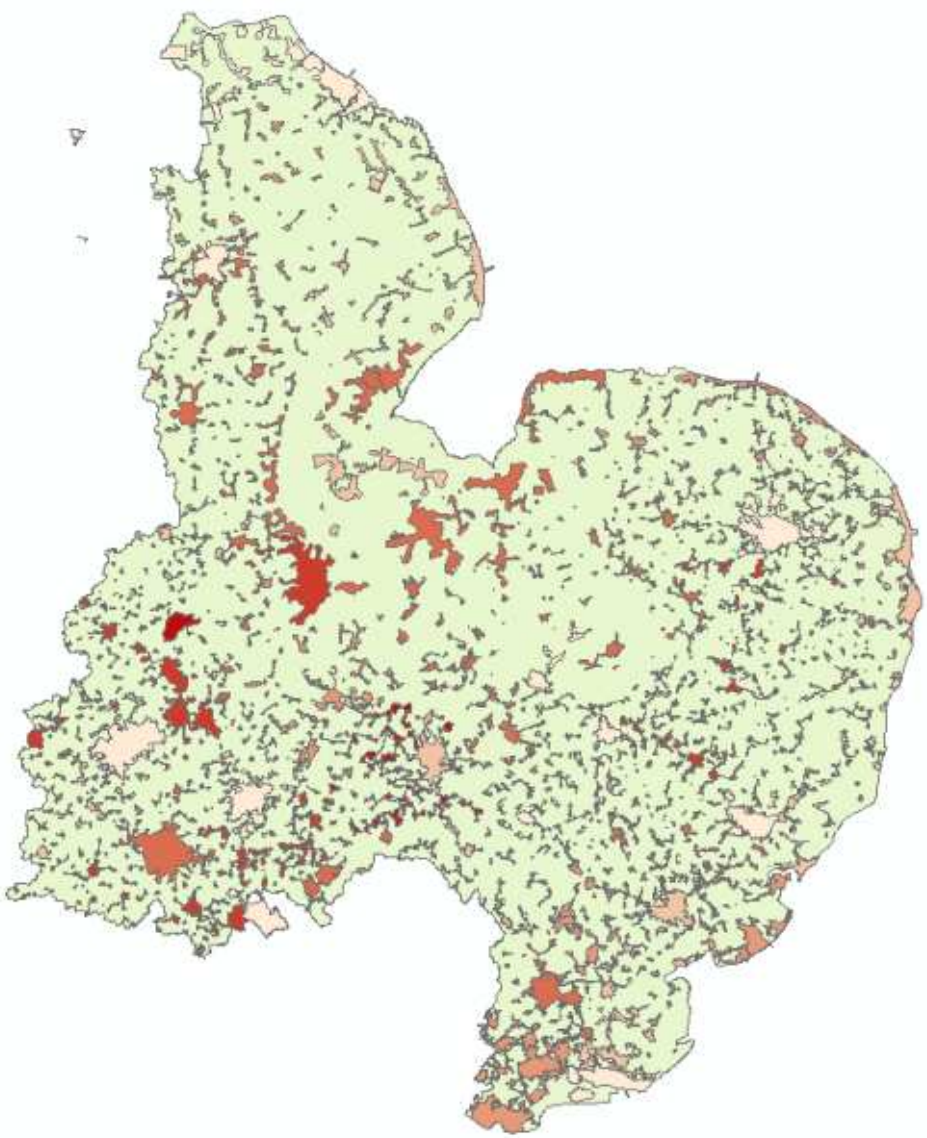


Figure 14 Growth to 2045



However, due to the nature of the housing development process, the pace and exact location of housing growth is uncertain. Additionally, population changes due to development and internal/external migration add further uncertainties to our understanding.

Our DWMP growth demand forecast model is designed to produce growth forecasts in alignment with our WRMP 2024 (Water Resources Management Plan) and WRE (Water Resources East) regional plan water forecasting processes. These forecasts are both based upon a unified foundation of Local Authority Planning data (collated by the external consultant, Edge Analytics) and ONS data.

The forecast model has been designed to produce geographically flexible outputs.It utilises spatial data systems and geographical information system (GIS) to facilitate data management, apportionment, reporting and visualisation.

The forecasting systems account for:

- The production of trend and plan-based forecasts for comparative analysis, based upon ONS, Local Authority Planning and internal Anglian Water datasets; additionally, forecasts are segmented according to EA guidance e.g. household (HH), non-household (NHH).
- Site specific details regarding development locations and build out rates (aligned with Local Authority Planning data).
- Property forecasts are converted to population using an average occupancy rate of 2.35.
- Assessments for influences on demand, and outputs including:
    - Population/household/occupancy changes.
    - Water use; changes in behaviour (affecting per capita consumption (PCC) changes in both HH and NHH customers).
    - Metering and meter opting effects (impacting PCC).
    - Increasing water efficiency and sustainability practices.
    - Changing design standards of devices that use water and government led interventions ('white good' labelling).
    - Changes in technology and practices for leakage detection and repair.
    - Climate change and weather patterns.
    - Transient holiday population holiday.
    - Non-HH (industrial) usage and forecasts for both water, trade and tankered effluent.
    - Population equivalent (biological load).
    - Dry weather flow.

Due to the large number of discrete sewer catchments we serve, forecasts are highly sensitive to development site locations, development timings and delivery build-out rates, which have a significant impact on the solutions we need to consider.It has, therefore, been imperative that we gain access to reliable site location and timing information in alignment with Local Authority Plans. Where the local plan has high confidence, i.e. it is adopted then we use these figures to guide our forecast. Where we do not have this information our forecast relies on ONS information. We continue to work closely with our Local Authorities to ensure we update with the most up to date information to guide our business as usual investments. This includes working with councils as they produce their Water Cycle Studies.

Where our catchments are shared with neighbouring water companies, we take into account the growth that will be treated by our sewerage system.

As we get updated information we will regularly review our figures internally to ensure our strategies are being implemented at the correct time and to the correct sizes.

Emerging growth areas and sites

Due to the scale of growth proposed across the East of England, the government and local authorities are working on initiatives to bring forward large-scale development. This involves the use of public sector land through developing new communities, the Garden Village and Town Programme and the exploration of potential of economic corridors. While many of these schemes are at an early stage and not included in adopted Local Plans, it is important to consider their impact on the long-term strategy, should they come forward. In these locations it will be important to have close liaison with the Local Planning Authorities and developers.

The strategic corridor of growth would have significant impact on our drainage area if it came forward. Due to the uncertainty of timing and location it has not been included in this DWMP. However we are actively involved in the progression and will update catchment strategies if and when required.

The DWMP, supported by Water Cycle Studies, provides a forum where these issues can be resolved before development plans are finalised. Working in partnership with our stakeholders, including local authorities and the National Infrastructure Commission, we will be better equipped to meet the expectations of our growing community.

Our adaptive investment programme for emerging growth will use this intelligence to assess risk during AMP8 to prioritise investment delivery.

Per capital flow (PCF)

Our forecast of the timing of DWF permit revisions at WRCs is heavily influenced by our forecast of average per capita returned flow (PCF). The PCF is used to calculate DWF and our forecast in flows. Per capita consumption (PCC) is aligned with WRMP24 and is forecast to reduce from 133 l/h/d in 2020 to 110 l/h/d in 2050. These reductions are due to the implementation of our smart meter program (100% smart penetration by 2030), water efficiency measures and the impact of government led interventions ('white good' labelling).

PCF is based on forecast average per capita household water consumption and forecast domestic non-household consumption. Our forecast of PCF assumes 90% of PCC and of non-household domestic consumption is returned. Note that there are significant uncertainties in both the forecast PCC and the relationship between PCC and PCF.

PCC has been geographically modelled to reflect the forecast meter penetration (visual read and smart) at water recycling catchment area level (based upon AWS Planning Zone data). This evaluation reflects both measured and unmeasured PCC values at the Planning Zone level. Forecast PCC values are derived from the WRMP 2024 'Consumption Forecast Model'. As meter penetration increases and smart meters are introduced, aggregate PCC values should decline (i.e. metering reduces consumption and PCC).

Declining PCC is a key variable in assessing whether a new DWF permit or demand management is required. As new permits drive significant investment there is a risk that we may underestimate future investment if PCF does not fall as expected.

5.7 Problem characterisation

The main aim of the problem characterisation phase was to understand how complicated it might be to resolve the risks identified in BRAVA.

To understand the risks we scored these six questions out of two:

- Would any potential 'stepped' changes in regulation result in significant constraints that would affect the ability of the WRC or combined sewer overflow (CSO) outfalls to discharges?
- Is there a strong understanding of catchment performance and what level of confidence is our hydraulic model?
- Is there a history of customer complaints, which are further at risk due to growth?
- If required, are there viable options available for catchment transfer (part or all flows) to an alternative catchment?
- Are sewer capacity constraints expected to need localised sewer upgrades or more strategic upgrades?
- Does the catchment have a high potential for significant growth outside of the local plan?

And we asked our stakeholders to score these four questions out of two:

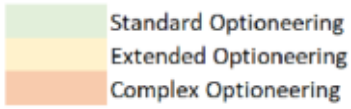
- Are there concerns about near/medium term (<15 years) system performance due to the uncertain impacts of climate change and/or new developments?
- Are there concerns about future (2050) demand system performance due to the uncertain impacts of climate change and/or new developments?
- Are there concerns about near or medium-term (<15 years) supply system performance?
- Are there concerns about future (2050) supply system performance?

The total from these assessments were combined and provided the problem characterisation score for the catchment. By using this scoring system and combing this with the BRAVA score, it allowed us to focus our efforts during optioneering on the catchments which were likely to have the most problems over the 25 year period. As outlined in the framework a matrix to combine the scores identified if a catchment should move into the optioneering phase as a standard, extended or complex catchment.

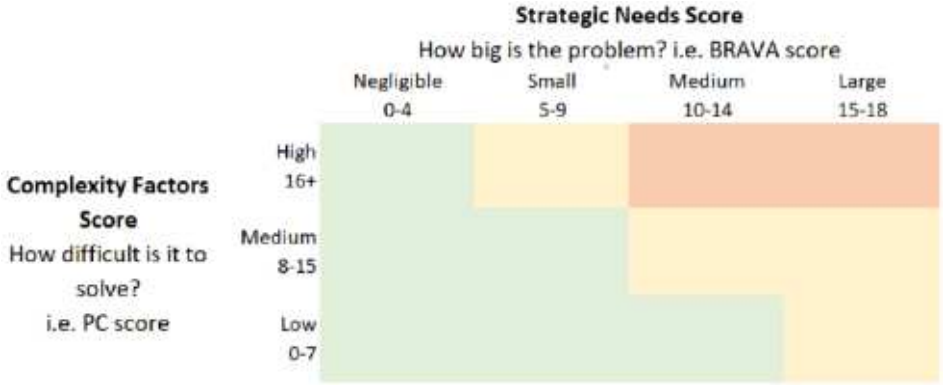
Optioneering is the in-depth consideration of various alternatives and options to find the best or preferred alternative, or option. Doing this makes sure that the solution is the best fit and makes the best use of resources.

As each catchment received a different BRAVA assessment depending on the risks identified at RBCS we created three separate matrices to fit the three catchment types. The 2035 BRAVA score was used to understand the risk.

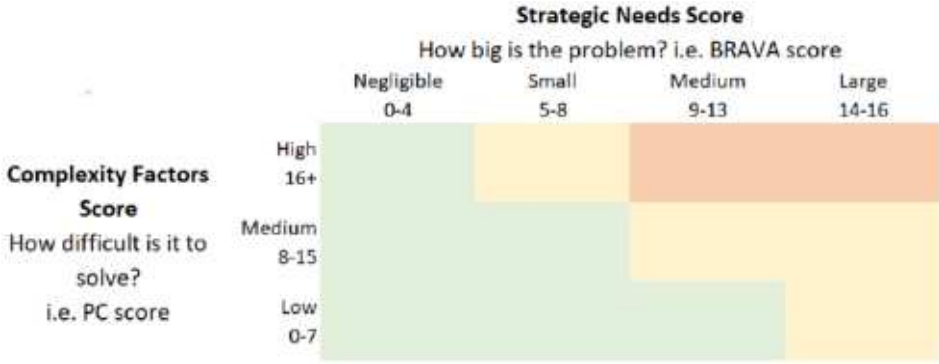
For each of the below the following key indicates the optioneering route selected.



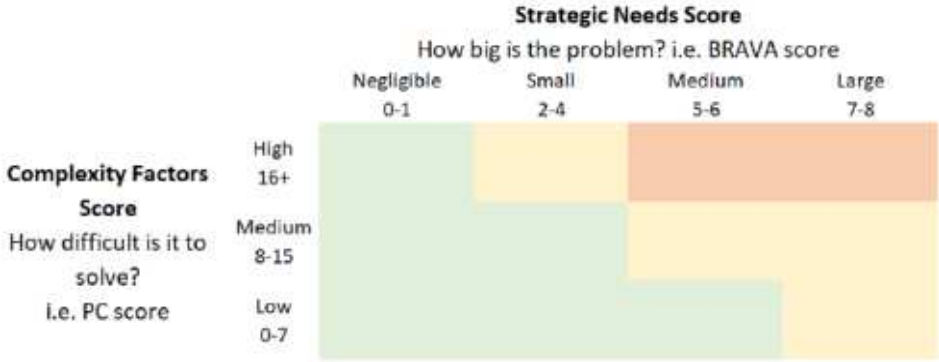
1. All planning objectives assessed at BRAVA - 380 catchments



2. All planning objectives except WRC quality - 6 catchments

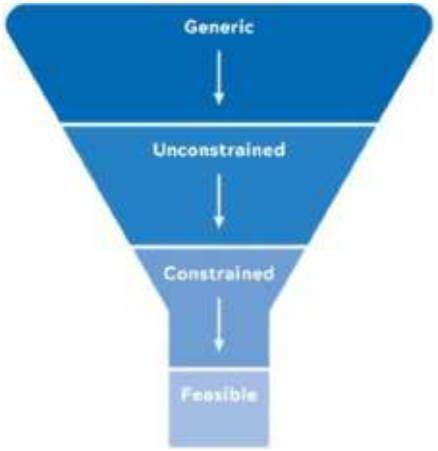


3. WRC compliance and Environmental and Wellbeing categories only - 187 catchments



5.8 Options development appraisal

Once risks had been identified in the BRAVA stage, the optioneering stage looked to find the most appropriate strategy to address the concern. To ensure all options were considered, the following process was used:



Each process is outlined in further detail below.

Generic options

The generic options are outlined below:

Table 9 Generic investment options

Group	Option	Further details
Customer side management	Water efficiency - household customers.	Water efficiency measures can be installed within buildings to help reduce water consumption. This can benefit the wastewater system because it reduces the dry weather flow passing through the sewer network and through the WRCs.
	Water efficiency - business customers.	
	Rainwater harvesting - household customers.	Removing surface water from the system and making it available to re-use. By installing measures which collect and store rainfall before it lands and is lost as runoff. Rainwater harvesting reduces the amount of flow that needs to be moved through the sewer network during a storm. This in turn reduces the likelihood of sewer flooding or spills to watercourses.
	Rainwater harvesting - business customers.	
	Customer education - household customers.	A roll out of an education programme to improve understanding of the importance of reduced flows and the impact this has on the environment and sewerage system. This could include, but isn't limited to, awareness of existing incentives for removing surface water, removal of misconnections, or pollution prevention through keep it clear.
	Customer education - business customers.	
	Greywater re-use - household customers.	Install systems to treat and re-use household water (excluding toilets) for flushing toilets and gardening use. Either at property level or larger scale to reduce both flow and load to the system. The treatment levels considered vary from treatment for potable use (water that is safe to drink), to pre-treatment for discharge into the combined or foul sewer network.
	Greywater re-use - business customers.	
Combined foul and sewer systems	Property level resilience - above ground.	Provide physical barriers.
	Property level resilience - below ground.	Install non return devices at property level. This will stop water returning back.
	Proactive maintenance - cleaning.	Network cleaning regime at expected hotspots.
	Proactive maintenance - rehabilitation.	Network replacement regime at expected hotspots.
	Intelligent operation.	Use forecasting tools and real time information to control assets.
	Increased conveyance - infrastructure.	Pass forward a greater flow by increasing pump rate.
	Increased capacity - attenuation.	Build additional capacity through storage tanks. This will create additional volume to reduce storm impact.
	Transfer within catchment.	Avoid pinch point by diverting sub-catchment flows to another area of the catchment.

Group	Option	Further details
	Transfer between catchments.	Transfer flows from sub-catchments or the whole catchment to another sewerage catchment.
	Reduce infiltration.	Reline the sewer and/or manholes to remove infiltration.
Surface water management	New foul sewerage.	Create new sewerage pipes for foul flows only.
	New surface water sewerage.	Create new sewerage pipes for surface waters only.
	SuDS - public.	Variety of potential SuDS options, including swales, attenuation ponds and green roofs.
	Surface water source control - rural.	Re-directing land flows away from sewers.
	Rainwater harvesting - public.	Removing surface water from the system and making it available to re-use. By installing measures which collect and store rainfall before it lands and is lost as runoff. Rainwater harvesting reduces the amount of flow that needs to be moved through the sewerage network during a storm. This in turn reduces the likelihood of sewer flooding, or spills to watercourses.
	Exceedance pathways.	The need to provide safe movement (as opposed to storage) for floodwater during an extreme rainfall event (when the capacity of the sewer network is exceeded).
	Exceedance storage.	Storage of flood water to be used at a later time.
	Partnership funding.	Work with a third party to deliver a scheme with multiple benefits.
	SuDS - household.	Water butts and/or local rain gardens to reduce/slow the flow into the sewerage system.
	SuDS - business.	
Wastewater treatment	Improved maintenance.	Fixing assets when a maintenance need arrives.
	Process optimisation.	Adjusting our processes to get the most out of our existing assets.
	Increased capacity - new streams.	Build multiple additional process tanks at a WRC.
	Increased capability - new process.	Build a new process tank at a WRC.
	New treatment works.	Build a whole new WRC.
	Relocate outfalls.	Move the discharge point to another watercourse.
	Water reuse - non potable.	Direct the WRC discharge (effluent) for a non-potable use instead of discharging into the watercourse.

Group	Option	Further details
	Water reuse - potable.	Direct the WRC discharge (effluent) to a water treatment works (WTW) for potable use instead of discharging into the watercourse.
	Smart consenting.	Work with the Environment Agency to permit at a catchment level rather than individual WRCs
	Catchment management - flows.	Work with users who discharge into the watercourse to collectively reduce high flows.
	Catchment management - quality.	Work with users who discharge into the watercourse to collectively reduce poor quality.
	Wetlands.	Create a wetland for treatment of effluent.
	Treat / pre-treat trade effluent.	Improve the quality of trade effluent before accepting it into the sewerage system.
	Proactive maintenance - non-infrastructure.	WRC maintenance regime at expected hotspots.
	Increased conveyance - non-infrastructure.	Pass forward a greater flow by increasing flow to full treatment (FFT) - the maximum flow a WRC can treat.
Other	Investigate.	Complete work to understand the problem better.
	Wait and see.	Monitor.

As not all generic options were relevant for each risk type, the risks were assessed against the generic options which may provide a potential solution. Generic options were compared against the planning objectives to identify whether the option was appropriate to address the risk. This initial review provided the unconstrained assessment of options for each catchment.

Table 10 Unconstrained options list

Group	Option	Planning Objectives
Customer side management	Water efficiency - household.	WRC DWF compliance
	Water efficiency - business.	
	Rainwater harvesting - household.	Escape from sewers
	Rainwater harvesting - business.	
	Customer education - household.	WRC DWF compliance Pollutions
	Customer education - business.	

Group	Option	Planning Objectives
	Greywater re-use - household.	WRC DWF compliance
	Greywater re-use - business.	
Combined Foul and Sewer Systems	Property level resilience - above ground.	Internal/External/1 in 50 flooding
	Property level resilience - below ground.	
	Proactive maintenance - cleansing.	Pollutions
	Proactive maintenance - rehabilitation.	WRC DWF compliance Escape from sewers
	Intelligent operation.	Internal/External/1 in 50
	Increased conveyance - infrastructure.	Escape from sewers
	Increased capacity - attenuation.	
	Transfer within catchment.	
	Transfer between catchments.	All planning objectives
	Reduce infiltration.	
Surface Water Management	New foul sewerage.	Escape from sewers
	New surface water sewerage.	
	SuDS - public.	
	Surface water source control - rural.	
	Rainwater harvesting - public.	
	Exceedance pathways.	Internal/External/1 in 50
	Exceedance storage.	
	Partnership funding.	Escape from sewers Environment and Wellbeing
	SuDS - household.	Escape from sewers

Group	Option	Planning Objectives
	SuDS - business.	
Wastewater Treatment	Improved maintenance.	WRC compliance
	Process optimisation.	WRC compliance Spills
	Increased capacity - new streams.	
	Increased capability - new process.	
	New treatment works.	
	Relocate outfalls.	WRC compliance
	Water reuse - non potable.	
	Water reuse - potable.	
	Smart consenting.	WRC compliance Spills
	Catchment management - flows.	WRC compliance
	Catchment management - quality.	
	Wetlands.	
	Treat / pre-treat trade effluent.	
	Proactive maintenance - non-infrastructure.	
	Increased conveyance - non-infrastructure.	
Other	Investigate.	All
	Wait and see.	

As part of the process we consider all options within the generic options to ensure we cover a range of different solution types. The solution chosen is selected through best value planning as outlined further in the document. However where possible we endeavour to manage the risk using solutions of no or low cost before we consider larger solution strategies.

Constrained and feasible options review - Escape from sewers

All catchments with escape from sewers risks were assessed through modelling to understand the catchment solution to address all identified risks.

To identify long term 2050 risks, each catchment was modelled to identify the overall flood volume expected in 2050. The catchment was then modelled against a range of solution strategies, surface water removal, infiltration removal, pump maintenance, sewer maintenance, demand management, increased conveyance and increase attenuation. The option scenario which reduced flooding closest to the predicted flood volumes was considered the most efficient option. This option was then reviewed to check for its feasibility, where feasible it was selected as the Long Term 2050 Strategy for the catchment. Where the first choice was not suitable, the second most efficient solution was selected as the 2050 strategy.

Where risks were identified before 2035, the catchment was run through another model assessment reviewing the solutions required to meet either 2030 or 2035 growth. Catchments were assessed with a range of scenarios with no climate change, 2 degree or 4 degree Celsius increase in climate, as well as a range of solution strategies - either attenuation only or a mixed strategy solution. An attenuation only solution looked at traditional type solutions including increasing storage through tanks and/or additional pipework. Mixed strategy solutions allowed all of the unconstrained solutions to be utilised where required. The number of scenarios modelled depended on the option strategy identified in 5.7 Problem characterisation and the number of risks identified during BRAVA.

The assessment of rainfall intensity due to climate change was calculated using the "Guidance for Water and Sewerage Companies and Flood Risk Management Authorities". Using nine catchments as a sample the average uplift in storage capacity required was 160% for a 2 degree Celsius increase, and 200% for a 4 degree Celsius increase. Climate change scenarios assumed the uplift in rainfall intensity you would expect in 2050.

Where a solution was identified as an Extended Catchment, as outlined in section 4.3, it was assessed against nine scenarios: 2030 growth with no climate change, 2 degree Celsius increase, 4 degree Celsius increase, each with an attenuation only or a mixed strategy solution; and a 2035 growth with no climate change, 2 degree Celsius increase, 4 degree Celsius increase, each with a mixed strategy solution.

Where a solution was identified as a Standard Catchment and multiple risks identified, it was assessed against all the scenarios specified above except the three 4 degree Celsius increase climate change scenarios. Where a solution only had one risk identified then it was assessed against the 2035 growth scenarios with no and 2 degree Celsius climate change.

Each catchment was split into cluster locations based on the risks identified. Where i) required solutions were identified for each cluster location, ii) the flood detriment was more than 5m3 and iii) we have a property on the DG5 register in that cluster location, a strategy was required. Where the flood detriment was more than 25m3, a strategy was required. If the cluster contained a DG5 property, then all flooding in that cluster was costed for removal, whereas detriment only was removed for clusters with no reported DG5. The solutions for all clusters were aggregated to create a full catchment solution, for each scenario.

Constrained and feasible options review - WRC compliance

We reviewed all catchments identified with a WRC compliance risk against the relevant unconstrained options. To complete this process we used a standardised set of rules and questions as outlined below. These were answered for the risks identified in 2030, 2035 and 2050 and provided us with the constrained list of options available at each future horizon.

Table 11 Constrained list of options available at 2030, 2035 and 2050

Group	Option	Rules/Prompt
Customer Side Management	Water efficiency - household.	Can reducing water usage help us meet permit?
	Water efficiency - business.	
	Customer education - household.	Would a local campaign bring flows down low enough?
	Customer education - business.	

Group	Option	Rules/Prompt
	Greywater re-use - household.	Can we work with developers to promote greywater re-use in new homes/commercial buildings?
	Greywater re-use - business.	
Combined Foul and Sewer Systems	Proactive maintenance - rehabilitation.	Does anything suggest sewer deterioration?
	Transfer between catchments.	Is there a catchment with spare capacity within 3km? Is the site at/near technically achievable limit?
	Reduce infiltration.	Are unaccounted for flows >25%?
	Improved maintenance.	Could this be managed through increase maintenance?
Wastewater Treatment	Process optimisation.	Can we adjust the operation of the works slightly?
	Increased capacity - new streams.	Do we need to meet a new FFT?
	Increased capability - new process.	Are there any capacity bottlenecks?
	New treatment works.	Is the WRC in poor condition? Or, would it be better suited to serve the growth elsewhere?
	Relocate outfalls.	Is the site at/near technically achievable limit? Does the WRC discharge into or upstream of a sensitive watercourse? Can we relocate to a less sensitive watercourse?
	Effluent reuse - non potable.	Is there a potential user for non-potable water?
	Effluent reuse - potable.	Is there a large treatment works nearby?
	Smart consenting.	Is the site at/near technically achievable limit? Can we work to catchment permit the waterbody?
	Catchment management - flows.	Can we work with abstraction licences to increase dilution?
	Catchment management - quality.	Can we work with partners to improve river quality?
	Wetlands.	Is the site suitable for a wetland?
	Treat / pre-treat trade effluent.	Are there high trade flows? Could working with traders support here?
	Proactive maintenance - non-infrastructure.	Are there potential early interventions?
	Increased conveyance - non-infrastructure.	Review pumping station capability

Group	Option	Rules/Prompt
Other	Investigate.	Do we need to find out more to make the decision?
	Wait and see.	Is the risk sufficiently low enough?

For 2050 we identified the most likely strategic option for that WRC, based on experience of the site and any anticipated investment requirements in the short/medium term. Given the adaptability of the plan, we did not cost the strategic solution for 2050.

For 2030 and 2035, we costed any constrained options where we were confident a localised solution would address the risk. For water efficiency, greywater re-use, proactive and/or improved maintenance, we collated all catchments identified to build up a L1 view of the potential scale of catchments with these options. These solution types would be promoted at a regional level and reviewed during our funding cycle to be implemented in the most appropriate catchment at the time.

Following this process each L3 catchment had a list of appropriate solutions, with costs associated where required, for 2030, 2035 and 2050.

Constrained and feasible options review - Environment and wellbeing

The 'environmental and wellbeing' planning objectives provided an indication of where we could do more to improve the natural environment, rather than creating a risk that required a solution. Therefore we didn't do a separate assessment where a risk was identified in the 'environment and wellbeing' planning objectives, however we incorporated this as part of our review of feasible and preferred options within those catchments.

5.9 Storm overflows

During wet weather, storm overflows release diluted wastewater into rivers or managed drains, preventing a combination of sewage and rain from overloading the sewers and backing up into homes and businesses. As climate change has led to greater rainfall, and as it has been increasingly difficult for water infrastructure to sustain the rising pace of population growth, their use has increased in recent years.

We are one of the few water companies with the ambition to deliver storm overflow improvement schemes within AMP7 (2020-2025). We will deliver at least 10 improvement schemes which will bring social, economic and environmental benefits to our region by 2025.

In 2022 we joined together with Severn Trent to form the Get River Positive partnership, which comprises five key commitments to safeguard and improve river health in both companies' regions. One of those commitments is to ensure that storm overflows and sewage treatment works do not harm rivers, with the aim of:

- eliminating all serious pollutions by 2025
- reducing less serious pollutions by 45%
- reducing spills from storm overflows to an average of 20 per year by 2025.

As part of this, between 2020 and 2025, we're reinvesting more than £200 million to reduce storm spills across the East of England.

We're currently outperforming against our environmental programme goals during this AMP through the early delivery of schemes that will reduce storm spills, helping to protect the environment and improve our rivers.

A significant proportion of schemes to increase storm tank volumes have been delivered between 1-3 years early.

In August 2022 Defra released their Storm overflows discharge reduction plan - GOV.UK (www.gov.uk) outlining a set of targets, and timeframes, for water companies to achieve improved environmental performance. The scale of improvements required to meet these targets is significant and required a separate assessment process to the DWMP.

All overflows will have an Event Duration Monitor (EDM) by the end of 2023. Whilst we have a huge amount of data already on our overflows, 100% coverage will improve our understanding of their performance. Over the next few years we will need to undertake a number of investigations to understand fully which overflows will require improvement. Whilst we

have reviewed where there may be potential impacts and efficiencies across the existing DWMP assessment, the plan to improve storm overflows did not go through Best Value Planning alongside the rest of the DWMP plan. However, as detailed further in 10.2 WINEP we are moving more towards a catchment based approach, therefore we will consider wider benefits when identifying solutions.

SODRP

1. Water companies will only be permitted to discharge from a storm overflow where they can demonstrate that there is no local adverse ecological impact.
   - The headline target must be achieved for most (at least 75%) of storm overflows discharging into or close to high priority sites (as defined in Annex 1) by 2035.
   - It must be achieved for all (100%) storm overflows discharging into or close to high priority sites by 2045.
   - Water companies must achieve this target for all remaining storm overflows sites by 2050.
2. Water companies must significantly reduce harmful pathogens from storm overflows discharging into and near designated bathing waters, by either: applying disinfection; or reducing the frequency of discharges to meet Environment Agency spill standards by 2035.
3. Storm overflows will not be permitted to discharge above an average of 10 rainfall events per year by 2050.
4. Water companies will be required to ensure all storm overflows have screening controls.

The plan we have proposed is set out to meet statutory requirements and timelines, with overflows prioritised by environmental risk. We started with a list of all of the Storm Overflows (SOs) which we own, which have been assessed against six trigger categories as laid out within the PR24 WINEP guidance, combined with Event Duration Monitoring data and hydraulic modelling for evaluating spills per annum.

High priority sites

We firstly compiled a list of all of the storm overflows we own and completed the methodology outlined by PR24 WINEP driver guidance.

We reviewed all of our SOs and identified whether they met one or more of the trigger points for EA prioritisation criteria as specified within the PR24 WINEP Driver Guidance, the drivers for which were developed to address new statutory requirements concerning storm overflow spill and impact reduction led by Environment Act 2021 clauses on storm overflows and informed by the Defra Storm Overflow Discharge Reduction Plan.

The six trigger points for prioritisation criteria are:

Reasons for Not Achieving Good (RNAG) - The storm overflow discharges into a water body which is classed as 'Confirmed' or 'Probable' for 'Intermittent Sewage'. This category also incorporates SOAF assessments and whether a storm overflow is flagged as causing an environmental impact.

Sensitive Inland Water- the overflow discharges into or within 50m of an SSSI, SAC, SPA, RAMSAR water feature, Chalk River, and/or Eutrophic Special Area.

Designated Shellfish Water- the overflow discharges into or <1km upstream of a designated shellfish water

Designated Bathing Water- the overflow discharges into or <1km upstream of a designated Coastal Bathing water or into or <5km upstream of a designated Inland Bathing Water. For coastal bathing waters, whether the overflow spills >3 (with good/sufficient status) or >2 (with excellent status) times per recording bathing season. For inland bathing waters, whether the overflow spills more than once per recording bathing season.

Spill- the overflow discharges >10 times per annum

6mm screen- the overflow does not currently have a 6mm screen that can take flows up to and including the 1 in 5-year return period flow rate.

To aid compiling our high priority list, we asked internal and external (regional rivers trusts) stakeholders to provide their weightings (1-5, with 5 reflecting highest importance weighting) of importance to the prioritisation factors, with the average weighting scores for sites taken into account when compiling the list. These included prioritisation factors from the DEFRA guidance, but also other prioritisation factors as offered by our stakeholders which we then added to our criteria including:

- The storm overflow was identified as a concern for our stakeholders in its catchment through the DWMP.
- The overflow is classified as substandard (e.g., limited screening etc. due to age of assets & permit).
- Storm overflows that discharge for more than 10 hours per year.

- Storm overflow discharges into non-bathing waters but the waters are known wild-swimming for recreational sites.
- Storm overflows that discharge into or within 50m of a Limestone River.
- Watercourses already suffering low flows/low dilution.
- Areas where overflows are known to cause fish deaths.

We applied these weighted scores to our list of storm overflows.

Assessing spill frequency

The PR24 guidance for spill targets is to improve all storm overflows spills so they do not discharge above an average of 10 rainfall events per year by 2050, using a 10-year average based on extrapolation of this EDM data and modelled data. Event Duration Monitors provide data on how often, and for how long, our storm overflows are used. We are still working towards 100% EDM coverage of our storm overflows (with the goal to have all EDMs in place by the end of 2023) and therefore do not have EDM data for all of our overflows. Further, the statutory spill frequency targets are based on averages over a 10-year period; the EDMs we currently have in place do not yet provide enough data to span 10 years. For this reason, we predominantly used modelled data to assess spill frequency across our storm overflows.

Hydraulic modelling used the current baseline model for all water recycling catchments containing a SO for this assessment. This includes all network overflows as well as overflows from storm tanks at WRCs. The analysis used Time Series Rainfall (TSR) using a 'Typical Year' dataset. The TSR's that have been generated have been based on a larger dataset and have 100yrs of data. Alongside this, the FEH13 rainfall was also taken into consideration which we started using in this AMP. Where the model predicted a spill above the relevant thresholds, the output provided us a storage volume required to reduce spills to between 0 and 20 spills. All spill events were counted and a spill event is defined using the 12/24 hr counting method. The spill output data was ranked in volume size for all of the spills that determines the volume required to reduced the spills down to the required spill number criteria.

The EDM data we do currently have has still been taken into account and was compared with the modelled data to indicate discrepancies, for example where modelled data indicates an overflow is predicted to spill under 10 times per annum on average, but the EDM indicates it spills over 10 times - or vice versa. This gave us a view of overflows which need investigative action to assess the cause for the discrepancy and to identify whether further investment is needed.

Building a high priority list

We reviewed all the available information outlined in the above sections to identify which of our overflows:

1. Met one or more of the trigger points as set out by the EA prioritisation criteria (as specified within the PR24 WINEP Driver Guidance) and the factors outlined by our stakeholders.
2. Had spill data available, provided either by modelled data, EDM data, or both.
3. Had spill data which indicated that the CSO spills >10 times on average per annum, or >2 times per bathing water season at bathing water sites, as per the spill frequency targets set out by the Driver Guidance.
4. Had been assessed for screening control and/or whether this met the screening requirements set out by the aesthetic impact control guidance.

A high priority list of storm overflows was predominantly shaped by points 1. and 3. above and integrated the stakeholder average weightings. Those which had hydraulic modelling data suggesting the SO does not meet the new spill frequency targets were positioned at the top of the list. Those which did not have modelling data, or had modelling data along with conflicting EDM data, were flagged as needing investigation (with high priority sites being put forward for earlier investigations).

The initial high priority list was taken to consultation within our internal Storm Overflows Technical Working Group for an opportunity to suggest list alterations, based on detailed/localised site knowledge (for example, whether sites were known to have investment planned for the current AMP, or whether a site was likely to soon become a designated bathing water and should be treated as such). Once the refined list was agreed upon, the high priority sites were proposed for earlier (medium term) investment and the lower priority sites were proposed for investment in the long term. To aid the process of investment scheduling, SOs were assigned to one of the following categories:

Storm Overflow categories

Category 1: Bathing water site with >2 modelled[a] spills per annum.

Category 2: Bathing water site with event duration monitor suggesting >2 spills per annum; modelled data is either not available or suggests <2 spills per annum.

Category 3: Non-bathing water high priority site with >10 modelled[a] spills per annum.

Category 4: Non-bathing water high priority site with event duration monitor data suggesting >10 spills per annum; modelled data is either not available or suggests <10 spills per annum.

Category 5: Non-bathing water, low priority site[b] with >10 modelled[a] spills per annum.

Category 6: Non-bathing water, low priority site[b] with event duration monitor data suggesting >10 spills per annum; modelled data is either not available or suggests <10 spills per annum.

[a]*Based on hydraulic modelling.*

[b]*A site was deemed low priority if it was not identified as a bathing water site or having an environmental impact based on prioritisation criteria.*

Timing of investment

As storm overflows were considered outside of the BVP process, investment planning was based on priority criteria. The above categories were used to determine whether an investment was required to investigate or enhance the SO, and whether this was driven by a need to reduce spill frequency and/or improve screening controls to meet the new guidance. Following the guidance, 38% of the highest priority overflows (those which crossed the most trigger points, carried heaviest stakeholder weighting and had highest spills indicated by modelling information) were proposed for earliest investment in AMP8 and were submitted as part of the WINEP programme. The remaining overflows allocated to the medium term or the long term, with overflows in the high priority areas proposed for earliest investment.

The list of SOs identified at risk is based on the current understanding of risk and performance. Those SOs in need of action will continue to be reviewed and priorities will be re-evaluated as and when updated information becomes available. Investment scheduling may be shifted to align with priority needs based on this.

Storm overflows requiring investigation

SOs which fell into Categories 2, 4 or 6 (where there was a discrepancy between the EDM and modelled data) were considered as needing investigation to understand whether data was accurate - and to identify the root cause in the case where an EDM falsely indicated more (or less than) than 10 (at non-bathing water sites) or >2 (at bathing water sites) spills were occurring. These investigations were spread across earlier AMPs, with bathing water and non-bathing water high priority sites prioritised for earliest investigations.

The SOs with investigation proposed may need later investment depending on what the investigation revealed; this could be a need for either an enhancement or maintenance scheme. If the investigations identify a maintenance issue (e.g. infiltration or incorrectly located monitor), this will come under a maintenance scheme; should the investigation reveal a capacity issue, this will require an enhancement scheme. If no issues are found, we will continue to monitor the overflow. The identified costs represent a total risk and do not differentiate between enhancement and maintenance.

Storm overflows not requiring investigation

All storm overflows which did not require a costed investigation for need (categories 1, 3 and 5) were allocated for costing across the 25 years. Investigations will still be completed as part of the scheme to ensure suitability for solution. Again, bathing water and non-bathing water priority sites were prioritised for earliest investment, with average stakeholder weighting taken into account.

Investigations

To estimate costs for investigations we applied an average unit rate based on on-site root cause investigations which include cost of CCTV and on-site investigations.

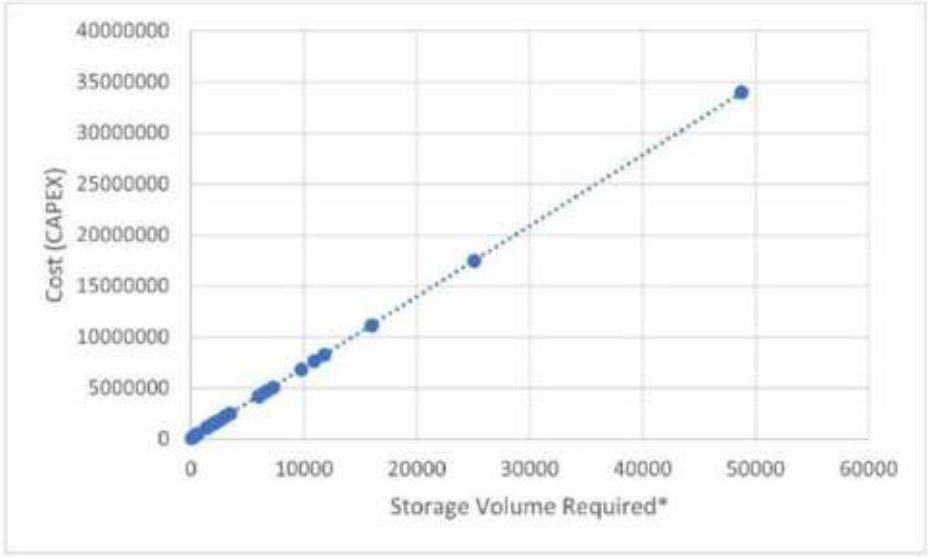
It was assumed that 40% of overflows investigated would require a level of investment and these were costed as outlined below.

Reducing spills

The highest priority sites, proposed for earliest investment, were costed based on site-specific storage volume required to reduce spill frequency to meet driver expectation, provided by modelling data. Options for grey and green storage solutions were costed; these were then used as a foundation to understand the investment levels for future schemes. We looked at the correlation between required storage volume and cost to assess how reliable our estimates could be; there was a strong correlation between cost and size of storage volume across the SO investments. We used this process for both grey and green solution options; however, we focussed our estimations on green solutions to give an 'up to' estimate and because they provide a good opportunity to work with partners and co-fund for multiple benefits, which is one of the main goals of the DWMP.

The graph below demonstrates the strong correlation (r = .99) between storage volume required for green solutions (SuDs; Raingardens) and cost:

Figure 15 Relationship between cost and storage volume



**Storage volume required has been converted to M^2 required for Raingardens.*

The equation of the linear regression line of the above is:

$y = 696.42x + 76138$

Where y = CAPEX and x = m^2 (converted from volume required). This equation determines where a theoretical value along the x axis on the graph above would correspond to a point of value along the y axis. This was used to estimate costs for all SOs which had modelled data available to inform storage volume required; all volumes (m^3) were converted to (m^2). For SOs which doesn't currently have this data available, the average cost across the datapoints was applied. This method used the costs from 2021/2022 price base, which was then uplifted to reflect the 2022/2023 price base to provide the final estimate.

Growth

Our hydraulic model on SOs was completed with a present day analysis and therefore did not contain any uplift for growth. Given the scale of reduction in spill count required it was felt that the smaller impact of growth upstream of a handful of overflows would be minimal in comparison to all overflows across the region. There will be some overflows where growth does impact the solutions required, these will be assessed and growth will be incorporated and funded separately when any scheme is being completed. For the purpose of this assessment no uplift in costs have been allocated for the purpose of growth specifically.

Climate change

As above, as the model was run on present day it excluded any impact for climate change. To make an allowance for this we reviewed the catchment solutions ran for the previous elements on the DWMP. Here catchment solutions were costed both on no climate change and two degree climate change scenarios, and in some cases four degree scenarios. To understand the impact of a two degree scenario an average cost difference between the no climate change, and two degree climate change, network solutions was assessed. This concluded there was an average uplift of 7% costs for climate change.

To ensure we're reflecting the impact of two degree climate change, in line with feedback from the draft DWMP, a 7% uplift on costs was placed on all solutions (excluding investigations and screens) for anything planned for AMP9 onwards.

Screening

All SOs will need to adhere to the new standards of screening requirement as outlined by the PR24 driver guidance. We have identified a number of storm overflows which we believe need the screen upgrading to meet new standards. We also need to continue with some investigations.

Managing uncertainties

Whilst we have a good level of certainty in the early AMPs, we acknowledge that our assessment on the investment required to meet the Storm Overflow Discharge Reduction Plan has less confidence in the later AMPs, where we are relying average costs and assumed level of risks. We are mitigating this risk in a number of ways:

Managing uncertainties

1. Increasing our Event Duration Monitors - we will have full coverage on all our overflows by the end of 2023.
2. Completing investigations on highest risk overflows, with a continued programme planned.
3. Completing site feasibility assessments to ensure the most appropriate solution is build for each location.
4. Continued discussions with stakeholders to identify partnership working opportunities where possible.
5. Reviewing our plan, publishing every five years within the Drainage and Wastewater Management Plan.

6. Programme Appraisal

To understand the most appropriate plan to put forward as our DWMP for consultation, we completed a best value plan assessment. This ensured that all our solution options were reviewed fully to understand the benefits they provided. Solution options were compared against each other to understand the most appropriate solution for that risk, as well as the most appropriate time to implement it. All options were compared against each other to create the best value programme.

6.1 Benefits

A best value planning (BVP) framework was initially shaped by our SDS (10.1 Anglian Water strategic plans) and was designed to align with our six capital framework (outlined below), which encourages us to take wider social and environmental benefits into account during decision making. Additionally, it was designed to complement the process used in the Water Resources Management Plan (WRMP) BVP framework. And in the development of our Long Term Delivery Strategy (LTDS) we are building upon our DWMP and SDS to set out our long-term vision for for the next 25 years, including what we intend to deliver in terms of key performance outcomes.

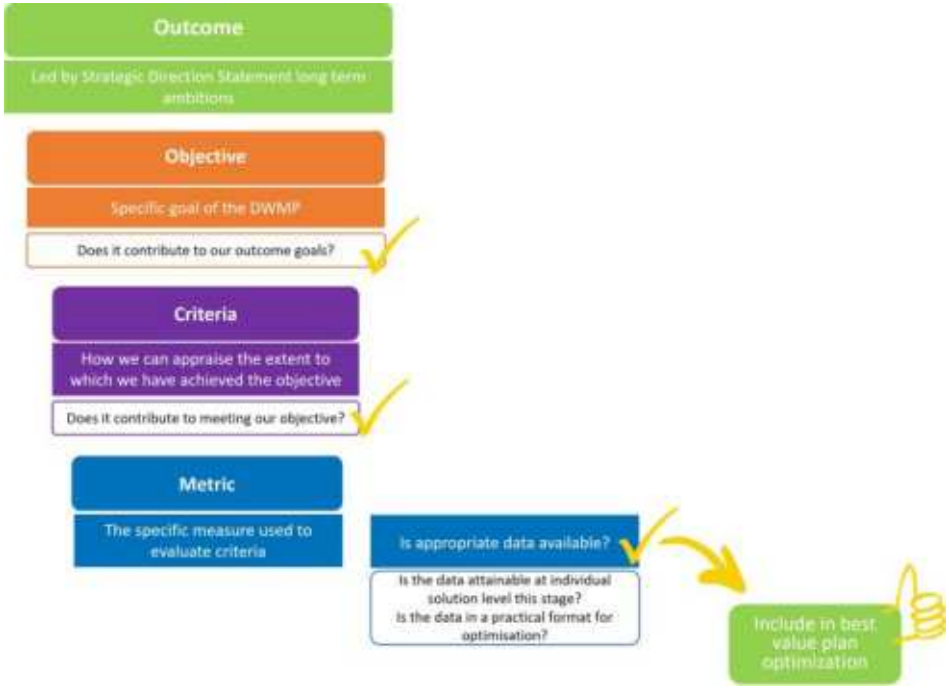
Figure 16 Six Capital Themes

Figure 17 Best value planning criteria

6.2 Included benefits

Ten core benefits which spanned across these aspects were identified and reviewed for inclusion as part of the best value planning stage. These were firstly reviewed for viability for their inclusion in the BVP process - for example, whether the necessary data for the assessment stage was available, or whether the data available allowed for high level or more detailed assessment. Each benefit was then assessed and scored to develop an optimized plan to maximise benefits, whilst minimizing cost and carbon emissions.

Figure 18 Choosing whether to include a benefit



The benefits for which data was available to enable assessment - and were therefore used for best value planning - are outlined below:

- **Scalability**

How easy would it be to upscale (expand) the solution to cope with potential or currently unseen future demand? This was scored 1-3 (1 = not very easy, 3 = very easy), with aim to maximise this value across our plans to aid development of a least regret plan - one which is adaptable to future needs.

- **Flooding Reduction**

What reduction in total flood volume (m^3) would the solution offer across the catchment? Hydraulic modelling data was used and plans were optimised to maximise flood volume reduction. Although pollution reduction has been included as a distinct benefit, flooding reduction will also inherently help to reduce pollution events, alongside mitigating damage and costs associated with flooding events.

- **Pollution reduction**

What pollution incident risk improvement does the solution offer? Scoring for this was based on the reduction of pollution event frequency risk for a WRC or WRN within a catchment; for example, a solution may reduce a risk frequency in pollution for a WRC from once per year (given a baseline frequency score of 1) to once every 5 years (a residual frequency score of 0.2), or eliminate the risk entirely (a residual frequency score of 0). The change from baseline to residual risk was used to score this benefit, with aim to maximise reduction across the plan.

- **WRC Compliance**

This benefit was assessed based on how many years the WRC is expected to remain within its compliance limits after the solution is implemented. For example, if a solution is expected to last for 10 years, the risk of non-compliance for the WRC would be 0.1 (1 in 10 years). The longer the solution is expected keep the WRC within compliance limits, the better the reduction of risk of non-compliance, along with environmental risks.

- **Population Growth/Demand**

What additional population equivalent (PE) does the solution offer to serve? Raw data (the difference from current PE served to projected PE served after solution implementation) was used with aim to maximise this benefit across plans.

- **Capacity (WRCs)**

What additional capacity does the solution bring to the WRC? Raw data (the change from current capacity for a treatment centre to the capacity expected to be provided by the solution) was used, with aim to maximise this benefit across plans.

- **Environmental benefit**

Carbon: Capital carbon (TCO2e) figures were provided for all solutions, with aim to minimise this value across plans. By minimising TCO2e at this stage of planning, we also minimise the scale of need - and associated costs - for schemes to offset carbon in order to reach Net Zero carbon by 2030.

Nature-based (Green) solutions: Incorporating green infrastructure into the DMWP is a top priority; beyond other benefits listed here which may also be offered by grey solutions, green infrastucture intrinsically mitigate drought/water stress, help improve water quality throughout our watercourses, have a positive impact on biodiversity and are environmentally friendly. We therefore included whether an option was as natural/green solution (for example, sustainable urban drainage system [SuDs] or wetlands) as a distinct benefit, with dichotomous scoring (yes or no) was used, with aim to maximise the amount of solutions selected for our plan.

Overall environmental potential: Using the environmental assessment outlined in 8. Environmental assessment- each solution was scored 1-3, based on how many environmental opportunities and potential risks it accrued across the environmental topics (see Table 14). A score of 1 indicated that a solution was neutral or offered only potential environmental opportunities; a score of 2 was given to solutions which offer a mix of opportunities and potential risks (for example, an opportunity for pollution avoidance but a potential issue for habitats, depending on its location); if a solution offers predominantly risk potential, it was given a score of 3. As such, minimisation of this score was an aim of the optimisation process.

- **Amenity/recreational benefit**

Does the solution offer recreational benefit and if so, how much? If a solution offered amenity benefit as part of its investment strategy (e.g., SuDs), it was further assessed based on its proportion (%) across the Business Investment Categories (BICs) for the investment. For example, if solution strategy implemented predominantly SuDs across the investment (e.g., 80% SuDs combined with 20% flow attenuation storage and sewers), the higher the solution would score on this benefit. For all solutions which did not provide any amenity value, a score of 0 was given. A score of 1 would reflect a solution incorporating <%50 SuDs as part of implementation; a score of 2 was given to a solution incorporating 50-75% SuDs; a score of 3 was given to solutions incorporating 75-100% SuDs. This value was intended to be maximised across plans.

- **Stakeholder Preference**

Is the solution preferred by our stakeholders? As part of our ODA workshops, our regional stakeholders were consulted and asked to indicate their preference of the generic solution options for tackling main risk themes (escape from sewers, WRC compliance and environmental wellbeing). These were rated as low, low-medium, medium, medium-high and high in preference by our stakeholders, which were later quantified for optimisation (1-3, respectively), with aim to incorporate the most preferred solutions into our plans.

- **Customer Preference**

Is the solution preferred by our customers? As part of our customer engagement piece at consultation 4.8 Customer engagement, we asked our customers indicate how appealing each of the generic solution options were for managing risks. Customers were able to rate each solution from 1-10 (where 1 = not at all appealing and 10 = extremely appealing. The scores were converted to a 1-3 (lowest-highest preference) to correspond to the ranking system used for other benefits, including stakeholder preferences.

- **Cost**

i) Whole Life Cost (WLC, £): What is the cost of the solution across its lifespan, taking into account operational and maintenance costs? Raw cost estimates were used with aim to minimise WLC to aid development of a least regret plan.

ii) CAPEX (£): How much will the solution cost to implement? Raw cost estimates were used, with inflation considered. This cost type was not used as a 'benefit' in the same way as WLC in that this was not 'minimised' across plans; rather, overall benefits were assessed against CAPEX for gauging value for the solution/plan. At the plan level, this provided a view of what maximum benefit can be achieved at the CAPEX threshold.

Table 12 Included Benefit Summary

Benefit	Metric	Minimise/Maximise
Scalability	1-3 (complex-easy)	Maximise
Flooding Reduction	Volumetric (M^3)	Maximise
Pollution Reduction	Frequency risk/likelihood reduction (%)	Maximise
WRC Compliance	Breach risk reduction (%)	Maximise
Population Growth/Demand	Additional PE (numeric)	Maximise
Capacity (WRCs)	Volume (M^3)	Maximise
Environmental Benefit: Carbon Nature-based Solutions Opportunity/risk	 TCo2e (numeric) Y/N (1/0) 1-3 (1 = Neutral/opportunity only; 2 = both opportunities and risks; 3 = more risk than opportunity)	 Minimise Maximise Minimise
Amenity/Recreation	0-3 (none-high)	Maximise
Stakeholder Preference	1-3 (low-high)	Maximise
Customer Preference	1-3 (low-high)	Maximise
Whole life cost	Currency	Minimise

6.3 Considered benefits

We considered six additional benefits, but are working on developing these further. We therefore did not assess them at the point of best value planning. Work will continue on these and where possible they will be included as part of our PR24 business plan.

- **Biodiversity Net Gain**

Given the early stage of best value planning for the DWMP, it was not feasible to calculate biodiversity net gain (BNG). The land used for solution implementation requires ecological assessment to predict net biodiversity gain, since this is based on baseline biodiversity for the land used for development. The geographical placement of solutions will only be understood later, during the development stage. However, despite the difficulty in quantifying BNG at this stage, we will consider it during the development stages and will follow the mitigation hierarchy - a framework embedded in planning and best practice that seeks to avoid and reduce any impacts on biodiversity in the first place, and to compensate for any residual losses. This includes seeking to deliver 10% on-site improvement by way of biodiversity/habitats, in line with our Natural Capital Performance Commitment.

- **Natural Capital Value (£)**

Natural capital was assessed based on the number of green-type/natural solutions, this was maximised through the optimisation process. We used a basic assumption that a larger number of these types of solutions would lead to increased Natural Capital. That natural capital value will be quantified later in the investment development process.

- **Offset carbon**

Whist CO2 emissions are minimised during the optimisation process, some solutions cannot currently achieve zero carbon emissions by design. In these cases, offsetting our residual carbon with additional schemes will be employed, in line with our Net Zero 2030. However, data to identify the schemes to offset specific plans will only be available later in the investment process and therefore offset carbon assessment not feasible for the BVP process.

- **Social Deprivation**

Once our best value plan was completed, we reviewed against a social deprivation layer to ensure that our plan covered a broad range of locations. Whilst this did not impact our chosen solutions, it allowed us to align the plan back to our purpose of social prosperity.

- **Storm Overflow (SO) spills**

Spills from overflows was not considered as its own benefit in best value planning. We completed a detailed review of storm overflow risk as outlined in 5.9 Storm overflows

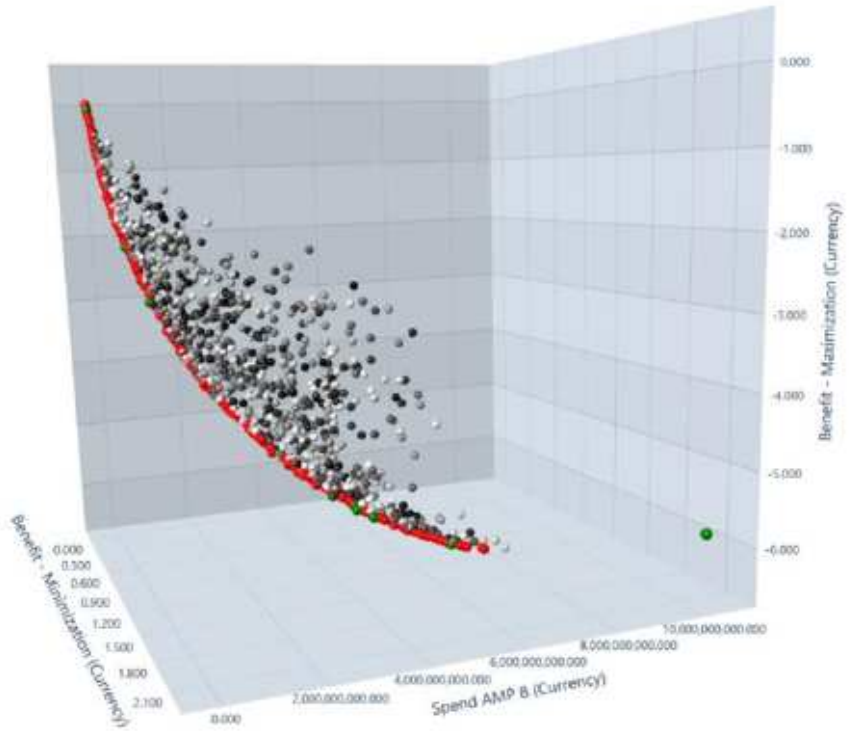
- **Future Non Household (NHH) customer needs**

We do not currently have forecasting data available to predict future NHH demand, however our plans were optimised to maximise scalability, which would support unforeseen future growth, as well as against a range of growth scenarios.

Optimisation

Benefit data across all solutions for catchments were entered into an optimisation tool, which uses advanced algorithms to compare vast combinations of options. The tool formulated a large set of possible plans, each incorporating a selection of solutions which maximise benefits whilst balancing risks and cost. Each benefit was equally weighted so that the optimiser programme would maximise benefits overall. The figure below demonstrates the process of plan optimisation by the tool. Each dot represents an optimised plan, with the red dots the pareto curve.

Figure 19 Optimisation graph



Optimisation was carried out for water recycling centres (WRCs) and water recycling networks separately; each of the optimised plans suggested at least one solution for all catchments which had risks identified (for either or both WRCs or networks) and suggested which solutions to prioritise earlier investment.

6.4 Best Value Planning

The range of optimised plans were narrowed down to a smaller selection, based on pre-determined criteria for manual comparison to identify a final best value plan. These are outlined below.

Scenario Testing

Three plans - all optimised to produce maximum benefits in all areas as listed in 6.1 Benefits - were initially selected based on the following scenarios.

1. Least Cost Scenario - The plan reflecting the point of investment where we begin to see an observable return in benefits for the least amount of cost.
2. High Growth Scenario - A plan reflecting the maximum benefit in terms of growth (PE) potential, considering the stage where more investment ceases generate substantial improvement in growth advantage.
3. Low Growth Scenario - A plan offering options which maximize benefits within a low growth (PE) scenario.

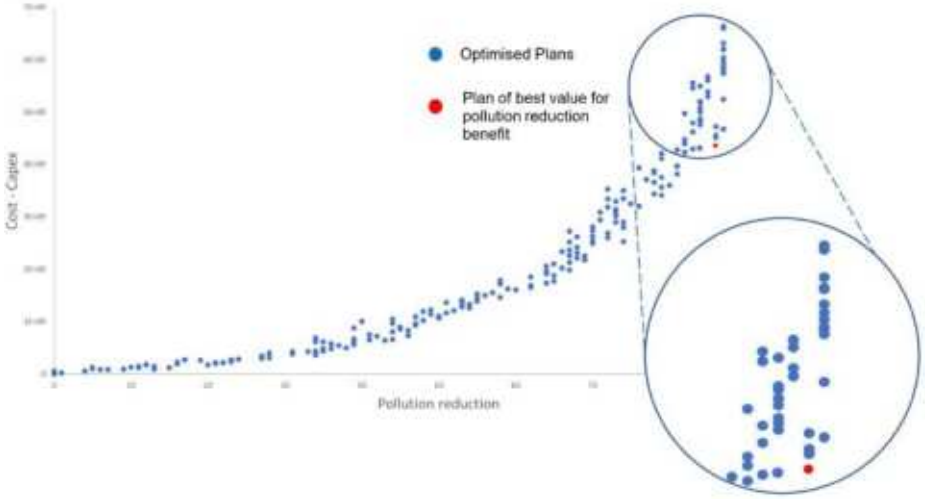
These scenarios will be used to help us develop the common reference scenarios as outlined by Ofwat for the Long Term Delivery Strategy.

In addition to the above scenarios, the range of optimised possible plans were additionally investigated to identify the plans of best value relative to individual benefits. The below figure demonstrates an example of where a plan of best value lies for pollution reduction (networks), across a scenario of unconstrained cost and based on where further investment would not generate substantial gains in pollution reduction.

This process was carried out for core benefits:

- Scalability.
- Recreational Benefit/Amenity.
- Nature-based solutions.
- Pollution reduction.
- Flooding reduction.
- Stakeholder preference.
- Growth (overall best value plan).
- Increased capacity.
- WRC performance maximisation.
- WRC DWF compliance maximisation.

Figure 20 Example benefit optimisation curve



Adaptability

Once this process was complete, to formulate the most adaptable solution strategy, the multiple plans of best value were collated and assessed for how frequently a solution was selected across all plans for each catchment. This gave us a clear view of which solutions were most 'adaptable' in terms of how many scenarios/plans each solution was chosen; for example, a solution chosen for a high growth scenario, but also repeatedly selected for several other optimised plans (e.g., pollution reduction, flooding reduction, scalability, stakeholder preference etc.) was adopted into the final overall best value plan. Additionally, how often these solutions were suggested for early investment prioritisation by the optimiser tool was assessed. The most adaptable strategy was formulated based on which solutions were selected with a minimum frequency rate of 50% across the plans. Furthermore, these solutions were proposed for AMP8 inclusion if the optimiser tool suggested them to be initially prioritised for investment at least 50% of the time across these plans. Following our dDWMP consultation and in line with stakeholder feedback suggesting we should prioritise solutions which address climate change wherever possible, we included this additional step: if a solution which incorporated climate change had been selected the majority - or near majority - of times across

the scenarios but did not reach the 50% threshold, they were force-selected to be prioritised. Additionally, where two solutions were selected an equal amount of time (whether or not this amounted to 50% selection for either), a solution which was green and/or offered highest climate change (e.g., 4° rather than 2°) was force-selected for prioritisation.The remaining set of solutions not prioritised for AMP8 were further profiled in for AMP9 or later.

Sense-checking

The plan was reviewed to ensure that the identified timings of solutions were appropriate. The Optimisation tool allowed us to adapt the plan for known need; for example, where new information following the BVP process revealed that a WRC was to become non-compliant earlier than originally forecasted but it had not already been prioritised for earlier investment based on the information used at the time, the solution was manually pushed forward for earlier investment as part of the plan. We will continue to monitor the most up-to-date information and continually review the DWMP and amend the plan as is necessary.The extent to which climate change was addressed across the final array of solutions was also assessed; this took into consideration how many 2 and 4 degree climate change scenario solutions were selectedand was used to evaluate the plan for climate change adaptability (see section 5.5 - 5.7 for details of how 2 and 4 degree climate change was built into solution options). Solutions were also evaluated to ensure that they were aligned with the WRMP.

Due to the catchment solutions, we did not subject the plan to the cost benefits test, this will be assessed at part of our business planning.

7. Draft to Final DWMP

Overview

Your feedback has helped us shape the final DWMP.

Our draft DWMP was published in June 2022 and had an eleven week consultation period. Additionally we published our Storm Overflow Discharge Reduction Plan consultation in February 2023 for a three week consultation period. Thank you to those who responded and fed back.

We also held a number of workshops with customers to gather their thoughts and views on our draft plan.

Following our first consultation we published an open letter response identifying the key themes of stakeholders concerns. The key highlights were that stakeholders on the whole agreed without our approach to having a DWMP resilient to a 2 degree climate change increase, strong support for using green infrastructure where possible, and overwhelming support for both surface water removal and working in partnership. We have used this information to help shape the final DWMP, as outlined further in 6. Programme Appraisal

For transparency we have published all comments received, and our response to them, in a separate Statement of Response, which is published on our website alongside this technical and the non technical DWMP.

Finally the plan has been through a rigorous assurance process, ensuring that we have created the DWMP following the framework guidelines, that we are meeting the Guiding Principles and that our Board have been engaged and agree with the process. Our Board Assurance Statement is published on our website.

8. Environmental assessment

Overview

During the optioneering phase we carried out an environmental assessment to look at two aspects of our plan. The first was to understand the environmental and social impact of all the generic options. The second was to review the environmental and social constraints for each L3 water recycling catchment.

During our review of the generic options, the following three phases were completed:

1. Screening of generic options to find out which options are likely to result in significant environmental or social impacts and a summary of the characteristics of catchments which should be considered in applying that generic option.
2. Scoping to identify, for those generic options that are screened in, what the main environmental and social impacts are for each of the environmental and social topics (expressed as issues and opportunities).
3. Summary of the scoping stage to identify the main environmental and social issues and opportunities for each topic.

Screening was applied to the generic options. For each generic option, assumptions relating to the potential environmental and social impacts of implementing the option were identified, followed by a screening exercise to identify whether there is a pathway between the generic option and a likely significant effect on the environment or social receptors. Social receptors are individuals, groups and community organisations or entities. They may be service users or employees, community residents, a specific neighbourhood or visitors.

To understand if there was likely to be any significant effect on environmental and/or social receptors it considers factors influencing whether there is a pathway including whether there is a new requirement for land; whether existing protocols for commonly undertaken tasks are in place to manage impacts; and the scale of the likely change affecting receptors. The generic options which were flagged as having a potential risk then went through a scoping process to identify potential impacts on each of the environmental and social topics. Given the non statutory status of the DWMP, neither a formal Strategic Environmental Assessment nor Habitats Regulation Assessment were completed. We used our environmental assessment as an indication of risk which will be considered further during detailed design.

For each generic option, any specific characteristics of a catchment that would make the generic option more or less suitable were identified.

Generic options screened in or out are below:

Table 13 Generic option environmental screening

Type of measures	Generic option categories	Examples of generic options	Assumptions to inform environmental screening	Screened in (progress to topic scoping)	Catchment suitability to this generic option
Customer side management	Water efficiency - household customers.	Water efficiency measures can be installed within buildings to help reduce water use.	Assume this relates to measures that are within curtilage of existing buildings.	Screened out	Greater benefits in urban catchments.

Type of measures	Generic option categories	Examples of generic options	Assumptions to inform environmental screening	Screened in (progress to topic scoping)	Catchment suitability to this generic option
		This can benefit the wastewater system because it reduces the dry weather flow passing through the sewer network and through the WRC.	Known benefits likely to occur in reducing demand for potable water and generation of wastewater.		
	Water efficiency - business customers.		Unlikely to significantly affect other areas.	Screened out	Greater absolute benefits in urban catchments.
					In addition, where commercial operators are a large contributor in a catchment, this generic option could deliver quick wins.
	Rainwater harvesting - household.	Removing surface water from the system and making it available to re-use. By installing measures which collect and store rainfall before it lands and is lost as runoff.	Assume these measures are within the curtilage of existing buildings.	Screened out	Greater benefits in total for urban catchments.
		Rainwater harvesting reduces the amount of flow that needs to be moved through the sewer network during a storm. This in turn reduces the likelihood of sewer flooding or spills to watercourse.	Assume these are small scale structures that temporarily reduce peak flows.		Greater opportunity for residents to implement this in suburban / rural catchments.
			Potential to reduce demand for potable water if harvested rainwater can be used.		
	Rainwater harvesting - business.			Screened in	In addition, where commercial operators are a large contributor in a catchment, this generic option could deliver quick wins.

Type of measures	Generic option categories	Examples of generic options	Assumptions to inform environmental screening	Screened in (progress to topic scoping)	Catchment suitability to this generic option
	Customer education - household.	Customer Side Management, including educational campaigns.	Assume these measures do not involve any physical interventions.	Screened out	Targeting towards those catchments where this would make biggest difference, or where other generic options may not be possible.
	Customer education - business.				Target towards those catchments with largest commercial wastewater producers.
	Greywater re-use - household.	Install systems to treat and re-use household water (excluding toilets) for flushing toilets and gardening use.	Assume domestic systems are within the curtilage of the existing buildings.	Screened out	Target towards catchments where this could be rolled out at a community level.
		Either at property level or larger scale to reduces both flow and load to the system.	Not likely to introduce significant impact or benefits.		
	Greywater re-use - business.	The treatment levels considered vary from treatment for potable use to pre-treatment for discharge into the combined or foul sewer network.	Assume commercial systems are within the curtilage of existing commercial property.	Screened in	Target towards those catchments with largest commercial wastewater producers.
Combined foul and sewer systems	Property level resilience - above ground.	Provide physical barriers.	These could be sited at properties or at source of problem.	Screened in	Not applicable (N/A)
			Barriers likely to fall within permitted development and no below ground impacts		

Type of measures	Generic option categories	Examples of generic options	Assumptions to inform environmental screening	Screened in (progress to topic scoping)	Catchment suitability to this generic option
	Property level resilience - below ground.	Install non return devices at property level.	Small devices to prevent internal flooding.	Screened out	Catchments where significant cultural heritage may lead to added time and/or cost consequences.
			Not likely to introduce significant impact .		
	Proactive maintenance - cleaning.	Network cleaning regime at expected hotspots.	Use established measures and methods for cleaning.	Screened out	N/A
	Proactive maintenance - rehabilitation.	Network replacement regime at expected hotspots.	Use established measures and methods for maintenance.	Screened out	N/A
			Existing procedures are in place for maintenance in sensitive sites.		
			Not likely to introduce significant impacts.		
	Intelligent operation.		No new physical interventions.	Screened out	N/A
			Not likely to introduce significant impacts		
	Increased conveyance - infrastructure.	Create a greater flow by increasing the pump rate.	Assume no new infrastructure, but intensified use of existing infrastructure.	Screened in	Benefits for catchments where development is constrained.
	Increased capacity - attenuation.	Build additional capacity through storage tanks.	Could be replacing existing storage tanks with greater capacity tanks or a new tank.	Screened in	Benefits for catchments with sensitive watercourses, where priority is to avoid overflows.
		This will creates additional volume to reduce storm impact.			

Type of measures	Generic option categories	Examples of generic options	Assumptions to inform environmental screening	Screened in (progress to topic scoping)	Catchment suitability to this generic option
	Transfer within catchment.	Avoid pinch points by diverting sub-catchment flows to another area of the catchment.	Diversion could be by new or existing pipe or making use of natural transfer features.	Screened in	Benefits for catchments with natural transfer features.
			Assumes that the diversion distance is relatively small (for example within the same catchment).		
	Transfer between catchments.	Transfer flows from sub-catchments or the whole catchment to another sewerage catchment.	Assumes that the diversion distance could be up to several kilometers.	Screened in	Benefits where catchment has a receiving watercourse or surrounding habitats are particularly sensitive.
	Reduce infiltration.	Reline the sewer and/or manholes to stop water getting in.	Use established measures and methods for maintenance	Screened out	Benefits for urban catchments.
			Existing procedures are in place for maintenance in sensitive sites.		
			Not likely to introduce significant impacts.		
Surface water management	New foul sewerage.	Create new sewerage pipes for foul flows only.	Use established measures and methods for maintenance.	Screened in	Likely to be most disruptive in urban catchments.
			Existing procedures are in place for maintenance in sensitive sites.		
			Assume these are within the catchment		
	New surface water sewerage.	Create new sewerage pipes for surface waters only.	Use established measures and methods for maintenance.	Screened in	Likely to be most disruptive in urban catchments.

Type of measures	Generic option categories	Examples of generic options	Assumptions to inform environmental screening	Screened in (progress to topic scoping)	Catchment suitability to this generic option
			Existing procedures are in place for maintenance in sensitive sites.		
			Assume these are within the catchment.		
	SuDS - public.	Variety of potential SuDS options, including swales, attenuation ponds and green roofs.	Assume these are either on AWS owned land or public land / buildings (in agreement with authority / landowner).	Screened in	Benefits most likely in urban areas of catchments.
	Surface water source control - rural.	Re-directing land flows away from sewers.	Assume rural setting means that not likely to disturb property and material assets	Screened in	Make the most of rural catchments to create additional habitat.
			Assume that methods could include natural transfer methods and provision of barriers.		
	Rainwater harvesting - public.	Removing surface water from the system and making it available to re-use. By installing measures which collect and store rainfall before it lands and is lost as runoff.	Assume no new sewerage infrastructure.	Screened in	Benefits most likely in urban areas of catchments.
		Rainwater harvesting reduces the amount of flow that needs to be moved through the sewerage network during a storm. This in turn reduces the likelihood of sewer flooding or spills to watercourses.	Assume rainwater harvesting / collection takes place on public land.		
			Assume variety of methods, scale, and duration of harvesting.		

Type of measures	Generic option categories	Examples of generic options	Assumptions to inform environmental screening	Screened in (progress to topic scoping)	Catchment suitability to this generic option
	Exceedance pathways.	The need to provide safe conveyance (as opposed to storage) for floodwater during an extreme rainfall event (when the capacity of the sewer network is exceeded).	Assume that methods could include natural transfers and provision of barriers.	Screened in	Most suited to catchments with opportunities for natural flood management.
			Assume this conveyance is distinct from building new sewers.		
	Exceedance storage.	Storage of flood water to be used at a later time.	Assume that this could be through new infrastructure (such as storage tanks) and making use of natural storage (such as floodplains).	Screened in	Make the most in rural catchments to create additional habitat.
	Partnership funding.	Work with a third party to deliver a scheme with multiple benefits.	Assume that while the process of arranging funding will not generate impacts, the opportunities for benefits are likely to be significant.	Screened out	N/A
			Assume that interventions are likely to take the form of other generic options.		
	Sustainable urban drainage systems (SuDS) - household.	Water butts and/or local rain gardens to reduce/slow the flow into the sewerage system.	Assume these measures are within the curtilage of existing buildings.	Screened out	Greater benefits in total for urban catchments.
			Assume these are small scale structures that temporarily reduce peak flows.		Greater opportunity for residents to implement this in suburban / rural catchments.
	SuDS - business.		Potential to reduce the demand for potable water if harvested. rainwater can be used instead	Screened in	Where commercial operators are a large contributor in a catchment, this generic options could deliver quick wins.

Type of measures	Generic option categories	Examples of generic options	Assumptions to inform environmental screening	Screened in (progress to topic scoping)	Catchment suitability to this generic option
Wastewater treatment	Improved maintenance.	Fixing assets when a maintenance need arrives.	Assume that this approach will deliver some efficiencies but is unlikely to have a significant effect.	Screened out	N/A
	Process optimisation.	Adjusting our processes to get the most out of our existing assets.	Assume that as this relates to existing assets, it's unlikely there's going to be a need for land.	Screened out	Urban catchments.
			Assume that some energy efficiency gains could be achieved.		Lots of designations.
	Increased capacity - new streams.	Build multiple additional process tanks at a Water Recycling Centre (WRC)	Assume that this will be on an existing WRC site or land adjacent to an existing WRC site	Screened in	Making best use of existing land benefits all catchment types, particularly urban catchments.
	Increased capability - new process.	Build a new process tank at a WRC	Assume that this will be on an existing WRC site or land adjacent to an existing WRC site	Screened in	Making best use of existing land benefits all catchment types, particularly urban catchments.
	New treatment works.	Build a whole new WRC	Assume that this would be an additional or replacement asset.	Screened in	·
			If it's a replacement, assume it could be on the same site, or an adjacent site, but it's likely to be on a different site.		
	Relocate outfalls.	Move the discharge point to another watercourse.	Assume that a consenting process will still apply	Screened in	Benefits in catchments with sensitive waterbodies and habitats.
			Assume that a new outfall pipeline may be required		

Type of measures	Generic option categories	Examples of generic options	Assumptions to inform environmental screening	Screened in (progress to topic scoping)	Catchment suitability to this generic option
	Effluent reuse - non potable.	Direct the WRC discharge for a non-potable use instead of discharging into the watercourse.	Assume this relies on identifying a suitable non-potable use reasonably close to the existing outfall, rather than providing lots of new infrastructure to reach the non-potable use.	Screened in	All catchments.
	Effluent reuse - potable.	Direct the WRC discharge to a WTW for potable use instead of discharging into the watercourse.	Assume this is most practical where the WRC and WTW are close to each other and therefore would not be considered practical for large distances.	Screened in	Benefits in catchments with sensitive waterbodies that do not require additional flow.
	Smart consenting.	Work with the Environment Agency to permit at a catchment level rather than individual WRCs	Assume the outcomes of this approach will result in maintenance or improvement of water quality.	Screened in	Benefits in catchments with sensitive waterbodies.
	Catchment management - flows.	Work with users who discharge into the watercourse to collectively reduce high flows.	Assume this focuses on collective demand management of flows.	Screened in	N/A
			Assume flow reduction will not result in any deterioration affecting the watercourse or biodiversity.		
	Catchment management - quality.	Work with users who discharge into the watercourse to collectively reduce poor quality.	Assume this focuses on collective efforts to reduce discharges of effluent that influence water quality.	Screened in	Benefits to catchments with sensitive waterbodies.
	Proactive maintenance - non-infrastructure.	WRC maintenance regime at expected hotspots	Use established measures and methods for maintenance.	Screened out	N/A

Type of measures	Generic option categories	Examples of generic options	Assumptions to inform environmental screening	Screened in (progress to topic scoping)	Catchment suitability to this generic option
			Existing protocols are in place for maintenance in sensitive sites.		
			Not likely to introduce significant impacts.		
	Treat / pre-treat trade effluent.	Improve the quality of trade effluent before accepting it into the sewerage system	Activities are likely to be located on the site emitting the trade effluent.	Screened out	Target towards those catchments with the largest commercial wastewater producers.
	Increased conveyance - non-infrastructure.	Pass forward a greater flow by increasing FFT	Assumes that this will reduce the reliance on existing storm water retention tanks so no additional infrastructure is required.	Screened out	Benefits for catchments where development is constrained.
			Assumes no overall change to the WRC operation in terms of quality and quantity.		
			Not likely to introduce any significant impacts.		
	Wetlands.	Create a wetland for treatment of effluent.	Assume that treatment will be predominantly nature-based with no/limited infrastructure requiring electricity supply.	Screened in	Rural catchments.
					Existing wetland habitat.
Other	Investigate.	Complete work to understand the problem better.	Assume that conducting the investigation will comprise only desk-based work or survey work.	Screened out	Existing poor water quality.
					Wellbeing.
	Wait and see.	No action. Observe and report incidents.	Assume no physical interventions.	Screened out	Not applicable.

Type of measures	Generic option categories	Examples of generic options	Assumptions to inform environmental screening	Screened in (progress to topic scoping)	Catchment suitability to this generic option
			While this approach may result in some pollution events, this is considered a business-as-usual approach and does not introduce new environmental or social impacts.		

For each of the generic options that were screened in, the environmental and social issues and opportunities were grouped into nine topic areas, which were broken into 20 objectives. To make sure there is consistency across all our strategic plans, these topics match the agreed, or proposed, environmental objectives for Water Resources East (WRE) Regional Plan, our Water Resources Management Plan 2024 (WRMP24), and our Drought Plan 2022.

Table 14 Environmental objectives

Our DWMP environmental assessment	
Topic	**Proposed objective(s)**
Biodiversity, flora, and fauna	To protect designated sites and their qualifying features.
	To deliver Biodiversity Net Gain (BNG), protect and enhance biodiversity, priority species and vulnerable habitats such as chalk rivers.
	To avoid spreading and, where required, manage invasive and non-native species (INNS)
Population and Human health	To maintain and enhance the health and wellbeing of the local community, including economic and social wellbeing.
	To provide drainage and wastewater management for the health and wellbeing of the community.
	To increase access and connect customers to the natural environment, provide education or information resources for the public.
	To maintain and enhance tourism, recreation, and amenity.
Material assets	To minimise resource use and waste production.
	To avoid negative effects on built assets and infrastructure.
Water	To reduce or manage flood risk, taking climate change into account.
	To meet the Water Framework Directive (WFD) objectives.
	To enhance or maintain surface water quality, flows and quantity, to meet environmental objectives.
	To enhance or maintain groundwater quantity and quality.
	To promote measures to enable and sustain long term improvement in water efficiency.
Soil	To protect and enhance the functionality and quality of soils, including the protection of high-grade agricultural land, and geodiversity.
Air	To maintain and improve air quality.
Climatic factors	To minimise/reduce embodied and operational carbon emissions.
	To introduce climate mitigation where required and improve the climate resilience of assets and natural systems.
Historic environment	To conserve/protect and enhance the historic environment, including archaeologically important sites, and their settings.
Landscape	To conserve, protect and enhance landscape and townscape character and visual amenities.

The generic options are grouped by customer side management; surface water management; combined foul and sewer systems; and wastewater treatment.

Where a topic was scoped out, it meant that it is unlikely that implementing that generic option will result in significant effects on environmental and social receptors. This does not mean that there will be no impacts, and this could change depending on the scale and sensitivity of the setting, but generally no significant effects would be expected.

Issues are anything that needs consideration to avoid adverse impacts on these topics. Opportunities are those considerations where there is an opportunity to improve existing performance or achieve additional benefits or enhancement.

The measured impacts for the screened in options are below:

Table 15 Potential environmental impact and opportunities

Type of measures	Generic option categories	Topics								
		Biodiversity flora and fauna	Population and human health	Material assets	Water	Soil	Air	Climatic factors	Historic environment	Landscape
Customer side management	Greywater re-use (business customers)	Scoped out	Scoped out	Scoped out	Opportunity: Storage to reduce peak flows and avoid flooding and pollution. Opportunity: To reduce water demand	Scoped out	Scoped out	Opportunity: Mechanism for adapting to climate change, particularly in urban areas	Scoped out	Scoped out
Combined foul and sewer systems	Property level resilience (above ground)	Scoped out	Opportunity: Barriers placed to avoid property flooding	Issue: New infrastructure required	Opportunity: Barriers placed to avoid flooding	Scoped out	Scoped out	Scoped out	Scoped out	Issue: Potential for visual impacts, depending on siting
	Increased conveyance - infrastructure	Scoped out	Scoped out	Scoped out	Opportunity: Additional pumping to avoid flooding	Scoped out	Scoped out	Issue: Additional pump rate requires additional energy / carbon	Scoped out	Scoped out
	Increased capacity - attenuation	Issue: Potential for habitat loss, depending on siting	Opportunity: To avoid property flooding	Issue: New infrastructure required	Opportunity: to avoid flooding	Issue: Potential for temporary disturbance during construction	Scoped out	Issue: Additional embodied carbon in storage tanks	Issue: Potential for impact on heritage assets, depending on siting	Issue: potential for temporary disturbance to landscape quality and visual impacts

Type of measures	Generic option categories	Topics								
		Biodiversity flora and fauna	Population and human health	Material assets	Water	Soil	Air	Climatic factors	Historic environment	Landscape
	Transfer within catchment	Issue: Potential for habitat loss, depending on siting	Issue: Potential for temporary disturbance during construction	Issue: New infrastructure required and potential crossing of existing infrastructure	Opportunity: Improve water quality and manage flows Issue: Potential effects on watercourses	Issue: Potential for temporary disturbance during construction	Scoped out	Issue: Potential increase in energy / carbon for transfers	Issue: Potential for impact on heritage assets, depending on siting	Issue: Potential to adversely affect landscape quality and visual impacts
	Transfer between catchments	Issue: Potential for habitat loss, depending on siting.	Issue: Potential for temporary disturbance during construction	Issue: New infrastructure required and potential crossing of existing infrastructure	Opportunity: Improve water quality and manage flows Issue: Potential effects on watercourses	Issue: Potential for temporary disturbance during construction	Scoped out	Issue: Potential increase in energy / carbon for transfers	Issue: Potential for impact on heritage assets, depending on siting	Issue: Potential to adversely affect landscape quality and visual impacts
Surface water management	New foul sewerage	Issue: Potential for habitat loss, depending on siting	Opportunity: Storage to avoid property flooding	Issue: New infrastructure required and potential for crossing other infrastructure	Opportunity: To avoid flooding. Opportunity: Release to avoid pollution incidents	Scoped out	Scoped out	Issue: Potential energy/carbon if pumping required	Issue: Potential for impact on heritage assets, depending on siting	Issue: Potential for temporary disturbance to landscape quality and visual impacts
	New surface water sewerage	Issue: Potential for habitat loss, depending on siting	Opportunity: Storage to avoid property flooding	Issue: new infrastructure required and potential for crossing other infrastructure	Opportunity: To avoid flooding. Opportunity: Release to avoid pollution incidents	Scoped out	Scoped out	Issue: Potential energy/carbon if pumping required	Issue: Potential for impact on heritage assets, depending on siting	Issue: Potential for temporary disturbance to landscape quality and visual impacts
	SuDs - public	Opportunity: Use natural areas for capturing surface water and increase biodiversity	Opportunity: Storage to avoid property flooding.	Scoped out	Opportunity: Storage to reduce peak flows and avoid flooding and pollution.	Scoped out	Scoped out	Opportunity: Mechanism for adapting to climate change, particularly in urban areas	Scoped out	Opportunity: New water features could improve landscape character and visual amenity

Type of measures	Generic option categories	Topics								
		Biodiversity flora and fauna	Population and human health	Material assets	Water	Soil	Air	Climatic factors	Historic environment	Landscape
	Surface water source control (rural)	Opportunity: Use natural areas for capturing surface and increase biodiversity	Opportunity: Storage to avoid property flooding.	Scoped out	Opportunity: Storage to avoid flooding and pollution.	Scoped out	Scoped out	Opportunity: Mechanism for adapting to climate change	Scoped out	Opportunity: New natural water features could improve landscape character
	Rainwater harvesting (public)	Opportunity: Use natural areas for capturing rainwater and increase biodiversity	Opportunity: Storage to avoid property flooding.	Issue: new infrastructure required	Opportunity: Storage to avoid flooding and pollution. Opportunity: Harvesting may reduce water demand	Scoped out	Scoped out	Opportunity: mechanism for adapting to climate change	Scoped out	Scoped out
	Exceedance pathways	Opportunity: To make use of natural habitats / wetlands for storage	Opportunity: Storage to avoid property flooding	Scoped out	Opportunity: Storage to avoid flooding.	Scoped out	Scoped out	Scoped out	Scoped out	Scoped out
	Exceedance storage	Issue: Potential for habitat loss, depending on siting Opportunity: To make use of natural habitats / wetlands for storage	Opportunity: Storage to avoid property flooding	Issue: New infrastructure required	Opportunity: Storage to avoid flooding. Opportunity: Release to maintain flows in watercourse	Scoped out	Scoped out	Issue: Additional embodied carbon in storage device	Issue: Potential for impact on heritage assets, depending on siting	Issue: Potential for temporary disturbance to landscape quality and visual impacts
	Sustainable Urban Drainage system (SuDs) (commercial)	Opportunity: Small scale biodiversity improvements	Opportunity: Storage to avoid commercial property flooding.	Scoped out	Opportunity: Storage to reduce peak flows and avoid flooding and pollution.	Scoped out	Scoped out	Opportunity: Mechanism for adapting to climate change, particularly in urban areas	Scoped out	Opportunity: New water features could improve visual amenity
Wastewater treatment	Increased capacity - new streams	Issue: Potential for habitat loss, depending on siting	Issue: May adversely affect amenity of nearby residents	Scoped out	Opportunity: Improve water quality and manage flows Issue: Potential effects on watercourses	Scoped out	Issue: Potential for adverse odour effects for nearby residents	Issue: Potential increase in energy / carbon for treatment	Scoped out	Scoped out

Type of measures	Generic option categories	Topics								
		Biodiversity flora and fauna	Population and human health	Material assets	Water	Soil	Air	Climatic factors	Historic environment	Landscape
	Increased capability - new process	Issue: Potential for habitat loss, depending on siting	Issue: May adversely affect amenity of nearby residents	Scoped out	Opportunity: Improve water quality and manage flows	Scoped out	Issue: Potential for adverse odour effects for nearby residents.	Issue: Potential increase in energy / carbon for treatment.	Scoped out	Scoped out
					Issue: Potential effects on watercourses		Opportunity: Reduce emissions by using improved processes.	Opportunity: Improve efficiency of site		
	New treatment works	Issue: Potential for habitat loss, depending on siting	Issue: May adversely affect amenity of nearby residents	Issue: New infrastructure required	Opportunity: Improve water quality and manage flows	Issue: Potential for loss of soils, depending on siting	Issue: Potential for adverse odour effects for nearby residents	Issue: Potential increase in energy / carbon for treatment	Issue: Potential for impact on heritage assets, depending on siting	Issue: Potential to adversely affect landscape quality and visual impacts
		Opportunity: Install equipment to remove excess nutrients			Issue: Potential effects on watercourses					
	Relocate outfalls	Opportunity: Relocate away from sensitive habitats / species	Opportunity: Relocate outfalls to improve amenity	Issue: May require additional infrastructure to reach new outfalls	Opportunity: Relocate away from sensitive waterbodies	Scoped out	Scoped out	Issue: May require energy for pumping to alternative outfalls	Scoped out	Opportunity: May stabalise riverbank.
	Effluent reuse - non potable	Scoped out	Issue: Potential for disturbance during construction	Issue: Require additional infrastructure between WRC and WTW	Issue: Likely to result in reduction in watercourse flows	Scoped out	Scoped out	Issue: May require energy and emissions to move water between WRC and WTW	Issue: Potential for disturbance during construction	Scoped out
	Effluent reuse - potable	Scoped out	Issue: Potential for disturbance during construction	Issue: Require additional infrastructure between WRC and WTW	Issue: Likely to result in reduction in watercourse flows	Scoped out	Scoped out	Issue: May require energy and emissions to move water between WRC and WTW	Issue: Potential for disturbance during construction	Scoped out

Type of measures	Generic option categories	Topics								
		Biodiversity flora and fauna	Population and human health	Material assets	Water	Soil	Air	Climatic factors	Historic environment	Landscape
	Smart consenting	Opportunity: To improve water habitat	Scoped out	Issue: May require additional infrastructure for new outfalls	Opportunity: To improve water quality across catchments	Scoped out	Scoped out	Issue: May require energy for pumping to alternative outfalls	Scoped out	Scoped out
	Catchment management - flows	Scoped out	Scoped out	Issue: may require additional infrastructure	Opportunity: To reduce volume of wastewater across catchments	Scoped out	Scoped out	Opportunity:lif lower flows, then less energy / carbon required in treatment	Scoped out	Scoped out
	Catchment management - quality	Opportunity: Improve water quality and habitat for species	Scoped out	Issue: may require additional infrastructure	Opportunity: To improve water quality across catchments	Scoped out	Scoped out	Issue: Potential increase in energy / carbon for treatment	Scoped out	Scoped out
	Wetlands	Opportunity: To add/extend wetland habitat	Opportunity: To provide recreational assets	Scoped out	Issue: Water quality affecting sensitive habitats	Opportunity: To improve soil health	Scoped out	Opportunity: Less energy / carbon method of treatment	Scoped out	Opportunity: Improve landscape character

Where a solution has identified it might create an opportunity for a topic then we'll focus more on it as part of the detailed design work. Where a solution has identified it might impact a topic negatively then this was either considered when identifying the best solution for that issue, or it will be thought about further as part of the detailed design work.

For each topic, a summary of the issues and opportunities was identified as below.

Table 16 Topic issues and opportunities

Topic	Summary of issues	Summary of opportunities / mitigations
Biodiversity flora and fauna	Potential for interventions to result in temporary and/or permanent impacts on habitats and/or species, depending on siting	Opportunity to use natural areas for capturing and storing surface water, which could help create natual habitats, such as wetlands and increase biodiversity
	Identify potential situations where there is a risk of INNS transfer	Opportunity to install equipment that removes excess nutrients and pollutants from wastewater
		Siting and relocating of new or expanded infrastructure away from sensitive sites

Topic	Summary of issues	Summary of opportunities / mitigations
Population and human health	Construction activity may cause temporary disruption	Opportunity to avoid property flooding
	Increasing the size or introducing new WRCs may affect the amenity of residents living nearby	Opportunity to provide/improve recreational assets
Material assets	New infrastructure required, which may involve crossing existing infrastructure	Consider routing options to avoid disruption to existing infrastructure
Water	Potential for reduction in flows in watercourses	Opportunity to reduce the demand for water
	Risk of reduction in water quality affecting sensitive watercourses	Opportunity to provide storage to reduce peak flows and avoid flooding and pollution
		Opportunity to control flows to improve water quality and manage flows
		Opportunity to improve water quality across catchments by taking a coordinated approach
Soil	Potential for temporary disturbance during construction	Avoid disturbing areas of healthy soil
		Replace any topsoil that is disturbed
Air	Potential for adverse odour effects for nearby residents	Update odour management plans for new or expanded processes
		Opportunity to reduce emissions by introducing improved technologies

Water recycling catchment environmental assessment

We completed the following four phases as part of the assessment:

1. Identification of the relevant environmental and social constraints, mapped and assigned to level 3 water recycling catchments and organised around the topics
2. Development of a RAG (red, amber, green) criteria for each topic to help identify the presence of environmental and social constraints for each topic in each catchment
3. Identification of the RAG criteria for each level 3 water recycling catchment
4. A RAG scoring to provide a ranked list of catchments

For this part of the environmental assessment all of our level 3 water recycling catchments progressing through the DWMP were reviewed against a range of environmental and social data sets to see if there were any key constraints that would need to be taken into consideration. These were presented in a RAG format. The RAG was then scored, red=1, amber=3, and green =5. A total score was provided for each catchment to provide an indication of the number of considerations that need to be made in each catchment. The outputs from this part of the assessment will be used during the detailed design stage of the options.

The table below shows the RAG criteria used for the assessment.

Table 17 Topic categorisation

Topic	Features	Data set	RAG criteria for catchment		
			Red	Amber	Green
Biodiversity, Flora, and Fauna	Statutory designated areas	Special areas of conservation (SAC), Special protection areas (SPA) and Ramsar (I.e. sites that trigger a Habitats Regulations Assessment (HRA))	Less than 400m from a designated site and/or major adverse effects on linkages to designated sites, and/or their qualifying features.	Within 400m to 5000m of a designated site and/or moderate/minor adverse effects on linkages to designated sites, and/or their qualifying features.	More than 5000m from a designated site. No adverse effects on linkages to designated sites, and/or their qualifying features.
		Sites of scientific interest (SSSI)	Direct effect or encroachment on SSSI and/or major adverse effects on linkages to designated sites, and/or their qualifying features.	Within a SSSI Impact Risk Zone (IRZ) and/or moderate/minor adverse effects on linkages to designated sites, and/or their qualifying features.	Outside a SSSI IRZ. No adverse effects on linkages to designated sites, and/or their qualifying features.
	Non statutory designated sites	Ancient Woodland	Encroaching on ancient woodland	Within 500m of an ancient woodland	More than 500m from an ancient woodland
		National Nature Reserves	Not applicable	Encroachment upon NNR	Within 500m from a NNR
		Local Nature Reserves	Not applicable	Encroachment upon LNR	Within 500m from a LNR
		Priority habitats	Encroaching upon priority habitats (such as chalk rivers)	Within 500m of priority habitats	More than 500m from priority habitats

Topic	Features	Dataset	RAG criteria for catchment		
			Red	Amber	Green
Population and Human Health	National and regional recreational facilities	National Trail	Not applicable	Requires land used for a national trail	Not affecting a national trail
		National Cycle Route	Not applicable	Requires land used for a national cycle route	Not affecting a national cycle route
Material assets	Strategic Road Network	Motorway	Not applicable	Requires crossing of, or land used for, a national motorway	Not affecting a national motorway
	Railway	Railway	Not applicable	Requires crossing of, or land used for, a railway	Not affecting a train line
Water	Groundwater	Groundwater source protection zones	Within Zone 1	Within Zone 2	Within zone 3
		Nitrate Vulnerable Zone	Within a nitrate vulnerable zone	Not applicable	Outside a nitrate vulnerable zone
	Surface Water	Flood Risk Zones	Within flood risk zone 3	Within flood risk zone 2 or 2/3	Outside of flood risk zones 2 and 3
	Water Framework Directive (WFD)	WFD waterbody	Discharges to WFD waterbody with Bad or Poor status. If waterbody is coastal, discharges to Bathing Water designation classified as 'Poor'	Discharges to WFD waterbody with Moderate status. If waterbody is coastal, discharges to Bathing Water designation classified as 'Sufficient'	Discharges to WFD waterbody with Good or High status. If waterbody is coastal, discharges to Bathing Water designation classified as 'Excellent', 'Good' or not designated
Soils	Agricultural Land Classification		Within grade 1 or 2 land classification (likely significant effect) and/or major adverse effects on linkages to sites, and/or their qualifying features	Within grade 3 land classification (potential for significant effect) and/or moderate/minor adverse effects on linkages to designated sites, and/or their qualifying features.	Within other or unclassified land (low potential for significant effect). No adverse effects on linkages to designated sites, and/or their qualifying features.
	Landfill Sites		Directly through authorised landfill site (likely significant effect).	Within 500m of an authorised landfill site and/or directly through historic landfill site (potential for significant effect).	More than 500m from an authorised landfill site and historic landfill site (low potential for significant effect).

Topic	Features	Dataset	RAG criteria for catchment		
			Red	Amber	Green
Air Quality	Air quality management areas (AQMAs)		Not applicable	Within 500m of an AQMA (potential for significant effect) and/or moderate/minor adverse effects on linkages to designated sites, and/or their qualifying features.	More than 500m from an AQMA (low potential for significant effect). No adverse effects on linkages to designated sites, and/or their qualifying features.
Climatic Factors	Not applicable to this stage		Not applicable	Not applicable	Not applicable
Historic Environment (Cultural Heritage)	Statutory designated sites	World Heritage Site	Direct effect on heritage sites or assets	Within 500m of heritage site or feature	More than 500m from heritage site or feature
		Conservation Area	Not applicable	Direct effect on conservation area	Not affecting conservations area
	Protected structures	Listed Buildings	Not applicable	Not applicable	Not applicable
		Scheduled Monuments	Direct effect on scheduled monuments	Within 500m of scheduled monument	More than 500m from a scheduled monument
	Non statutory designated sites	Registered Parks and Gardens and Battlefields	Direct effect on registered parks, gardens or battlefields	Within 500m of registered park, garden or battlefield	More than 500m from a registered park, garden or battlefield
Landscape	International or national designations	Areas of outstanding natural beauty (AONB)	Within AONB or national park	Within 500m of an AONB or national park	More than 500m from an AONB or national park
		National park			

9. Resilience

Overview

It is important that we have the ability for our assets to maintain performance in extreme weather. Our resilience assessment reviewed the assets at risk of fluvial, pluvial and coastal flooding.

The Anglian region has a high proportion of flat and low-lying areas, including The Fens in Cambridgeshire and the Norfolk Broads. A quarter of our region lies below sea level which means we are acutely aware of the risk of flooding to our assets, and the knock on impact this has on the service we provide to customers and the environment.

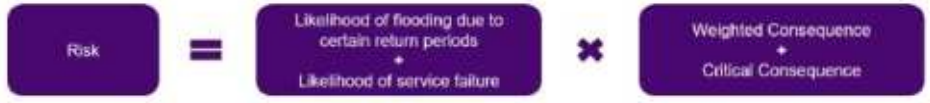
In addition, historically water and water recycling infrastructure has been built next to or near water, either rivers, streams or the sea, to aid abstraction for potable water supplies, and the return of recycled water back to the environment. While this makes for an efficient water and water recycling system, it brings an element of risk associated with flooding from watercourses and the sea. Our assets are also at risk from surface water and groundwater flooding.

Under the Civil Contingencies Act, as a Category 2 responder, we have a duty to meet our responsibilities to assess risks and plan for emergencies, including the flooding of our assets. As such, as part of PR24 we have built on work undertaken previously to assess the risk of flooding to our assets, and incorporated new climate change risk assessments to better understand the current and future risk of flooding.

Understanding the risk of flooding to our assets

Building on our experience of assessing flood risk at PR14 and PR19, we have recently worked with Ambiental and Royal HaskoningDHV to undertake the latest and most detailed flood risk assessment of our assets ever undertaken. This work followed a three step process to help us better understand the components of the following equation:

Figure 21 Risk equation for flood risk



1. An initial screening of all water and water recycling above ground assets to establish a long list of sites at risk for a more detailed assessment. Pluvial, fluvial, coastal and groundwater risks were all assessed.

   We used a range of scenarios to assess the risk, including four climate change scenarios (including RCP 2.6 and RCP 8.5 from UKCP18 which equate to 2o and 4o temperature rises), fours epochs (looking out to 2025, 2030, 2035 and 2050), and six storm return periods (1:30, 1:75; 1:100, 1:250, 1:500 and 1:1,000).

   This step helped us identify the likelihood of flooding, based on the depth of water at a particular asset, and the likelihood of service failure, based on the depth and extent of flooding.

2. We then undertook a detailed site assessment process to generate a short list of sites with a significant risk to service from flooding. This included a detailed desk-top analysis that prioritises the risk to assets using both likelihood and consequence, asset owner verification by our operational teams and site visits to assess the actual flood risk to assets, including taking height measurements to determine the level of protection required and the investment need.

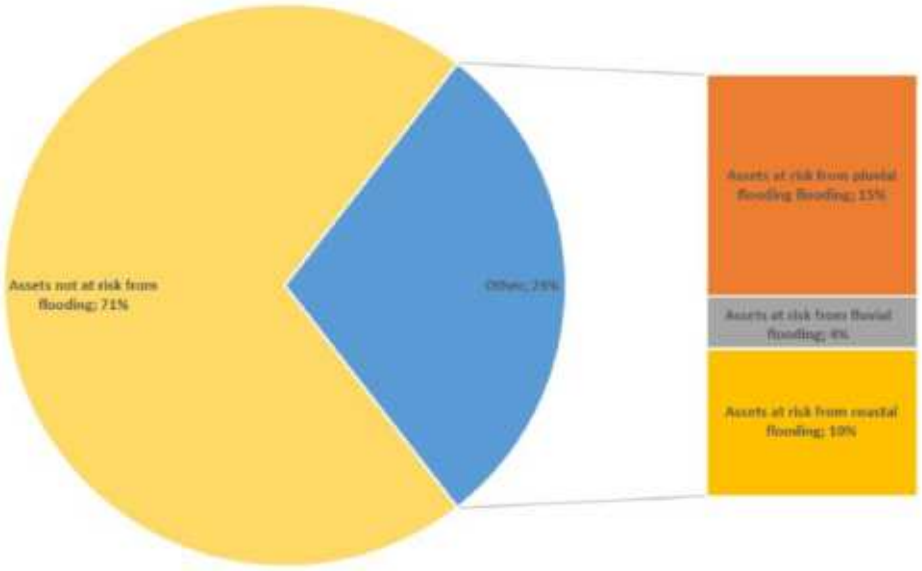
   To determine weighted and critical consequences, the impact and cost of service failure, and the proximity to environmental destinations, as well as the population served by an asset were all used.

3. The final step in the process was to develop solutions that would protect our assets for submission as part of the PR24 business plan.This might include physical interventions, such as flood walls, flood doors or temporary barriers, or developingresponse and recovery plans.

Our findings

With more detail about the flood risk to our assets than we've ever had before, we are now able to assess in greater depth what the probability and consequence are of asset failure. We are also better able to consider both the impacts of temporal scale and climate change on the risk to our assets, having received results for four separate epochs, and four climate change scenarios. Combined with the six storm return periods for three separate types of flood risk, and data for over 7,000 assets, this work has provided us with over 2 million flood depth points.

Figure 22 Percentage of assets at risk of flooding



From this data, we can see that for a 1:100 year flood event in the present day, 29% of our sites are at risk from at least one source of flooding. This drops to 21% when flooding over 200mm is considered. This breaks down to 256 assets at risk from only fluvial flooding, 1,072 assets at risk of just surface water flooding, and 716 assets at risk of only coastal flooding.

However, many assets are at risk from multiple sources of flooding. For example, 123 assets are at risk from all sources of flooding, and 1,166 assets are at risk from fluvial and pluvial flooding.

The results clearly show the impact of climate change looking forward to 2050. Using a 4oC temperature rise some interesting results are found. Most notably, fluvial flood risk drops from 256 assets to 200 assets, whilst pluvial flooding increases from 1,072 assets to 1,212 assets at risk. The likely cause of this, according to our consultants, is that river flows will reduce across the East of England due to climate change, so baseflows will be lower, whilst more intense summer storms will increase the risk of surface water flooding.

Whilst we have not considered the 'positive' impacts of climate change previously, it is clear that this data allows us to take a more nuanced view of our risk, enabling us to make informed decisions about the risk of flooding, and take an adaptive approach to investment where required.

Next steps

Investment to protect our assets from flooding is only proposed where it is necessary to supplement other measures that we already have in place to maintain service to our customers, and protect the environment. We use the Cabinet Office's infrastructure resilience components to identify the best possible approach to managing risk, with resistance, such as flood walls, just being one solution we could use. Alternative approaches include the development of flood emergency response plans for our operatives to use when flood warnings are released by the Environment Agency.

We also have a dedicated East Coast Flood Plan which draws on the learning we have gained from past flooding events in 2007, 2013 and 2017. An east coast tidal surge is the biggest single risk to our asset base, as the risk of flooding occurs over a 12 hour period, so it is essential that we focus of this to maintain service.

Cabinet Office Infrastructure Resilience Components

Resistance

Measures include permanent flood barriers, such as flood walls around the perimeter of the site, flood walls around individual assets, flood doors, waterproofing buildings and air vent covers. We also have access to 500m of demountable flood barriers, which can be used at sites without permanent flood resilience measures.

Reliability

Measures include raising electrical panels and ensuring communication and telemetry are maintained during an incident.

Redundancy

The ability to re-zone water supplies to ensure no loss of service to our customers.

Response and recovery

High-risk sites have Flood Emergency Response Plans, which detail the actions to be taken by staff on site including the critical assets to protect and safe access routes. During incidents we have the ability both to provide potable water and to remove foul water using tankers.

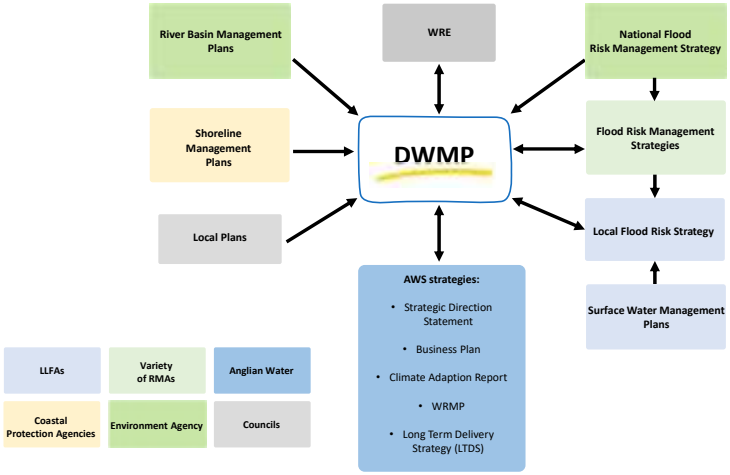
10. Other strategic plans and commitments

Overview

The DWMP is only effective if it is in line with other strategic plans. We ensured that we worked with those creating other plans and aligned strategic goals.

Alongside the DWMP other strategic plans are being created by both us and our external partners. These strategies all interact with each other to ensure they complement each other.

Figure 23 Alignment of strategies



As noted above, the DWMP will inform the development of our Long Term Delivery Strategy (LTDS).

As well as strategic plans we have made a number of commitments which are outlined below. The DWMP is a tool to support us to achieve these.

10.1 Anglian Water strategic plans

Strategic Direction Statement

Our Strategic Direction Statement (SDS) outlines our four long term ambitions. Our DWMP builds on all four of these to ensure we serve our customers whilst meeting our purpose. Our other strategic plans build on our SDS to achieve these ambitions and realise the benefits.

SDS ambitions

Water Resources Management Plan

The Water Resources Management Plan (WRMP) is the water plan for 2025-2050. These plan also builds on our SDS to meet the strategic aims. We have worked closely with the team developing the WRMP to ensure the strategies being developed across in both the WRMP and DWMP complement each other.

To align with our WRMP and regional plans we are pro-actively developing a water reuse scheme at Colchester WRC, additionally Essex & Suffolk Water are progressing their plans to develop water reuse at Southend and Lowestoft WRCs.

Business plan

Our next business plan, known as PR24, will be published in October 2023. 11. DWMP to PR24 outlines in more detail how the DWMP has fed into the production of PR24.

Long Term Delivery Strategy

The water industry is facing a series of long-term challenges, and Ofwat have recognised that these cannot be addressed without a more long-term approach to business planning. As a result, they have introduced the Long-Term Delivery Strategy for PR24, which requires companies to use adaptive planning and set out:

- Objectives for 2050
- The strategies required to deliver these objectives, and
- The enhancement required by these strategies.

Through the development our our LTDS, we will continue to refine our DWMP strategy, and this will inform our PR24 Business Plan in turn. This includes:

- Building upon our Strategic Direction Statement to set out our long-term vision for for the next 25 years, including what we intend to deliver in terms of key performance outcomes,
- Testing our strategy against the Common Reference Scenarios to develop adaptive pathways, and establish what investment is required now, and what can be delayed until later in the timeline,
- Developing our understanding of the potential benefits of emerging technology, and
- Reviewing proposed investment within the context of the wider enhancement programme, to ensure the strategy is both affordable and deliverable.

Figure 24 LTDS alignment

Get River Positive

River health is fundamental to improve ecological quality, and we know that there is more we need to do in making all our rivers the healthiest they can be. That's why, in 2022, we established our Get River Positive programme in partnership with Severn Trent. It is our shared commitment to protect and revitalise rivers by 2030. These pledges demonstrate our commitment to creating a flourishing environment and delivering on the expectations of customers and stakeholders to transform river health across the region.

The plan is underpinned by five key pledges as a framework for action:

1. Ensure storm overflows and sewage treatment works do not harm rivers
2. Create more opportunities for everyone to enjoy our region's rivers
3. Support others to improve and care for rivers

4. Enhance our rivers and create new habitats so wildlife can thrive
5. Be open and transparent about our performance and our plans

Where we stand today (May 2023):

- Average duration of spills per Event Duration Monitor (EDM) down 64% in 2022, compared to 2021.
- We're on track to meet our target of 20 spills on average across all storm overflows by 2025. In 2022 we were below that number. The average number of spills across all storm overflows with EDMs in place in 2022 was 15, down from 25 the year before.
- Overall EDM coverage at 86%, up from 54% in 2021. We're on track to deliver 100% coverage by the end of this year.
- We've received £7 million of additional shareholder reinvestment to accelerate river health improvements in 2022-23.

Whilst we have made strong progress this year in establishing our foundations and ensuring that our year one Get River Positive projects such as the Stiffkey Restoration and the Rivers Trust Strategic Partnership get underway, this is just the start. We continue to build on our commitments and are expecting to invest £1.2m on river and environmental health, seeking match funding from partners to have an even bigger impact. Our primary mission is to reduce RNAGs - rivers that are not yet achieving good status.

Our plan to 2030 is taking a nature-first approach for future investment. This will include:

- More sustainable urban drainage schemes (SuDs), building on the success we have had over the past three years.
- Increase storm tanks to keep surface water out of sewers to reduce spills further.
- River-restoration projects.
- £50million commitment to 26 new pioneering treatment wetlands.
- New nutrient removal schemes.
- Dedicated CSO WINEP submitted to Ofwat.

Get River Positive is the start of a movement, of tangible action that will deliver the changes we all want to see. Whilst we've worked hard to create sustainable improvements, the complex myriad of factors affecting river health means we can't do this alone. As the Environment Bill became the Environment Act, we made it clear we felt even more action was needed to ensure the future health of our rivers - by coming together as an industry, securing the right investment as part of the regulatory process, and working collaboratively with other sectors.

We will also monitor bathing water designations, and support meeting new targets where relevant.

No organisation can deliver sustainable water management alone which is why it's vital we bring the right people together. The measure of our successes will be based on the merit of our partnerships, and we believe that by working with our partners across the region we can create a vibrant, resilient and productive natural environment.

10.2 WINEP

The Water Industry National Environmental Programme (WINEP) provides a framework for statutory and non-statutory environmental delivery obligations. Water companies achieve these throughout an AMP period to meet certain environmental targets. The WINEP has its own guidance and is created in collaboration with the Environment Agency. The final WINEP commitments will be published alongside our business plan in 2023.

The WINEP covers a range of water recycling areas, including performance of WRCs, impact on bathing waters, investigations into chemicals, reduction of storm spills, and others. We have reviewed where there are overlaps between WINEP and DWMP solutions, to ensure they are compatible. Besides storm overflows, we have not included the cost of other WINEP drivers within the DWMP. Again, besides storm overflows (where both enhancement and maintenance schemes are identified), for this first cycle of DWMPs we have not forecasted future iterations of WINEP schemes beyond AMP8. At time of publishing the DWMP there is some uncertainty around the level of requirement for river water monitors to be installed by water companies, as such this has been excluded from the DWMP and will be considered separately within WINEP.

The majority of WINEP drivers will continue alongside the DWMP solutions without much interaction, for example a chemical investigation programme. However WINEP drivers which affect permit limits at WRCs are critical to understand. Some WINEP drivers are taking the permitted level of ammonia or phosphorus down to technical achievable limit (TAL). When this happens it removes the feasible option of applying for a new permit, unless we have a technology which can achieve a tighter limit with

consistency. We have reviewed all WRCs where this is the case and identified an alternative option where possible. In some cases we have not been able to find an alternative feasible solution, we have identified where this occurs and will seek to work with the Environment Agency to identify an alternative option to enable growth whilst protecting the environment.

Advanced WINEP

For this WINEP water companies were given the option to provide suggestions for an Advanced WINEP programme. These were to be schemes which look at doing things differently to address environmental risks.

Our vision for the Advanced WINEP (A-WINEP) is to achieve the highest level of ambition for the environment whilst minimising cost and risk to our customers. We plan to do this by demonstrating an approach to maximise value by going even further for the environment through:

- Partnership working (including leveraging significant partnership funding)·A focus on the use of nature-based solutions.
- Delivering wider environmental outcomes.
- Improved multi-stakeholder governance.
- Innovative funding models.

Our A-WINEP approach will embed the mechanismsand governance arrangements required to enable widespread implementation of nature-based solutions through effective partnership delivery at scale, developing an exemplar pathfinder to drive a fully outcome based WINEP programme in PR29.Deliveringcustomers' growing ambitions for the environment and the Government's 25 Year Environment Plan will need new, more collaborative approaches.

We intend to use the A-WINEP as a pathfinder for innovative governance and partnership funding toinform wider changes planned for WINEP PR29.

Amongst the opportunities that we are exploring, we have identified catchments for the holistic delivery of surface-water management, and will be looking to develop partnership structures to enable this approach.It is currently a concept we would like to explore, and to do so we have proposed two catchments, Great Yarmouth (Caister) and Southend, for a full catchment based approach. To manage surface water to improve the environment, whilst also addressing other needs in that catchment. We would utilise partnership working and prioritise green infrastructure.

10.3 External strategic plans

Our stakeholders also produce strategic plans to understand the future pressures on their assets and responsibilities. We have worked with the Environment Agency to ensure our DWMP outputs reflect the strategic aims of both the River Basin Management Plans and the Flood and Coastal Erosion Risk Management reports.

Water Resources East Regional Plan

Water Resources East (WRE) are working closely with many stakeholders, as well as our WRMP team, to review long term requirements for the supply and demand of water across our region. Working closely with our WRMP team we have ensured there is a consistency in the messaging and solutions.

Local plans

The local plans produced by the councils outline the expected development rate of housing in their area. As outlined in section 5.6 Forecasting growth we used this as the basis for our DWMP forecasts.

Surface Water Management Plans

Surface Water Management Plans (SWMPs) and other localised risk plans were included in the DWMP through discussions and feedback during stakeholder engagement. These risks were identified during the problem characterisation stage, and during optioneering when we identified areas for collaborative working.

10.4 Anglian Water commitments

We have made various commitments and pledges, all of which complement our Purpose of bringing environmental and social prosperity to the region we serve through our commitment to love every drop. Here, two are highlighted:

1. ### Being a carbon neutral business by 2030

The options chosen in the DWMP will feed into our carbon neutral strategy. You can find out more about our carbon commitment by reviewing our net zero strategy here.

2. Get River Positive

Together with Severn Trent we have signed up to five key commitments which form the Get River Positive plan. We are absolutely committed to putting in the work on our end, and bringing the right people together, to get our rivers into shape.
The partnership has committed to:

- Ensure storm overflows and sewage treatment works do not harm rivers.
- Create more opportunities for everyone to enjoy our region's rivers.
- Support others to improve and care for rivers.
- Enhance our rivers and create new habitats so wildlife can thrive.
- Be open and transparent about our performance and our plans.

We've also committed to creating 26 new treatment wetlands.

The DWMP is an element of supporting this wider pledge.

10.5 Nutrient neutrality

On 16 March 2022, Natural England (NE) provided advice to Water Companies and Local Planning Authorities regarding that plans and projects in certain geographic areas risks increasing nutrient levels beyond acceptable levels.

Under the Habitats Regulations, activities which would cause further damage to a Habitats site which is in an unfavourable condition can only proceed when the damaging impacts are effectively mitigated. NE has identified several Habitats sites where plans and projects must demonstrate that they are not damaging Habitats sites by adding more nutrients. Natural England advises that a “nutrient neutral” approach is a robust way to enable development to proceed.

Developers need to deliver projects (developments) that demonstrate zero net increase in nutrient levels within the catchments of these Habitat Sites (or “nutrient neutrality”), allowing competent authorities (LPA) to make more informed planning decisions.

Suitable mitigation measures might include constructed wetlands, changes in land management or retrofitting Sustainable Urban Drainage systems within the catchment of the impacted site(s). This means that nutrient damage to Habitats Sites will not be made worse through these developments, allowing nature recovery plans to start reversing existing damage. Importantly, development that can mitigate nutrient impacts and demonstrate nutrient neutrality will be permitted, assuming it passes all other planning requirements.

We collaborated with Norfolk Rivers Trust, William Morfoot and landowner James Wilson to create a wetland downstream of Ingoldisthorpe WRC and the river Ingol. The wetland consists of four cells at precise levels to create the correct rate of water flowing slowly though the cells. Final effluent from Ingoldisthorpe WRC drainsthrough the sequence of naturally planted pools (cells), which successively filter out the undesirable elements within the water. Once the process is completed, the ‘cleaned’ water then flows out from the final pool into the river Ingol.

The plants chosen to grow in the wetland absorb phosphate and ammonia whilst also having the added advantage of generating widespread benefits to the local ecosystem. The water returned to the river Ingol meets the phosphorus limit of 4.5mg/l without chemical dosing.

Wetlands at WRC’s cam be as effective as to reduce phosphorus by 60-70% with 1 hectare of wetland can remove up to 128kg of inorganic phosphorus per annum.

Whilst nutrient neutrality is a new challenge, Ingoldisthorpe wetland treatment should be considered as a template for nature based solutions to support.

10.6 Measures of success

It is important that we can have a line of sight with alignment between the DWMP and the other strategies.

We expect that for external plans there are common strategies, targets and goals. And that we continue working together to achieve these.

For our internal strategies our Purpose of bringing social and environmental prosperity to the region, as well as meeting our four Outcomes from the SDS drive everything that we do. We expect to meet our obligations as outlined in the WINEP, and for our internal long term strategies to align.

The measures assessed during the DWMP impact our Environmental Performance Assessment (EPA), and a key measure of success is scoring well.

11. DWMP to PR24

Translating strategy to business as usual

This final DWMP is a cumulation of over three years worth of collaboration with stakeholders, following the DWMP framework to achieve a co-created long term strategy. It focusses purely on the risks to the water recycling system and outlines where we expect solutions will be required, and how we can adapt to changing futures.

With the information gathered throughout the creation of the DWMP we can now create our PR24 business plan having highlighted the correct risks. Our proposed solutions are supported by our stakeholders and have been informed by our customers.

We have shared the outputs of our DWMP in one of two timeframes, either the medium term (by 2035), or long term (by 2050). This was purposely done to allow us to share the risks we face and the proposed strategies to address them, whilst baring in mind the flexibility that is needed to meet the affordability challenges which occur during business planning. Although the DWMP provides an indication of when solutions may be required, this will be reassessed as part of the development of our LTDS and PR24 Business Plan. This includes using the Common Reference Scenarios to establish what investment is required now, and what can be delayed until later in the timeline. We will also need to review the DWMP within the context of the wider enhancement programme, to ensure the strategy is both affordable and deliverable. Either way the strategy as identified in the DWMP will remain the same.

When we publish our business plan, we will publish an accompanying document which outlines any differences between the final DWMP and PR24 submission and our LTDS.

12. Regional plan

Overview

Catchments were assessed as either being low risk, long term strategy only, or medium term concerns. This section identifies how many fell into each section out of the almost 600 catchments which progressed through the DWMP process.

Following the initial screening, almost 600 of our water recycling catchments were assessed at 2050 to understand the impact from future growth and climate change. Our assessment process, as outlined in 5. Plan development, considered risk to our water recycling catchments against our agreed planning objectives.

The DWMP outlines the identified appropriate solution strategies, and the best estimate of the required timing for these, using the information currently available to us. The solutions chosen in the DWMP enable us to make least regret choices in selecting solutions which address a range of future scenarios. The DWMP has also been designed to be adaptive, with regular monitoring of the trigger points which would drive the solutions to be invested in. We will continue to monitor each catchment, utilising our biggest ever installation programme of sewer monitors. As well as work with our stakeholders, to ensure that we implement the solutions at the right time - whilst driving to meet the overall long-term strategy for that catchment.

12.1 Risk breakdown

We assessed the risk in 2030, 2035 and 2050. Identifying which catchments had risks which required addressing in the short to medium term (by 2035), and those which were long term only. Some catchments fell into a generally lower risk group. For each catchment we identified the appropriate strategy to address the concerns, costing the solution alternatives where a short to medium term risk was identified. We have promoted partnership working where opportunities have been identified and will continue to seek further partnership opportunities.

12.2 Low risk catchments

Assessing across the planning periods, the process identified that 218 catchments presented low risk in 2050. For these catchments no further work was completed, we will continue to monitor in future DWMP cycles.

For the remaining catchments we reviewed when the risk is presenting itself and identified a range of potential solutions to address the risk.

12.3 Long term strategy only

63 catchments indicated a low risk of concern by 2035, but an increase in risk by 2050. We evaluated a range of options to address these risks, using modelled data and our understanding of the catchments.

Removing up to 25% of surface water from our network was the most popular long-term strategy for addressing the risk from Escape from Sewers. We are keen that nature based solutions are promoted where possible and where it is identified as being cost beneficial. Therefore, many of our catchments are promoting a mix of greener Sustainable Drainage Solutions (SuDS) and more traditional infrastructure.

For our water recycling centres (WRCs) we're facing an increase in pressure between the extra loading received from catchment growth, and the standards required to meet the river water quality. Over the next 25 years we're going to have to think differently about how we might address the future risks, whether this be through using a treatment technology not yet invented, or by thinking of alternative strategies. Due to the uncertainties around the benefit of future technology, we've completed the DWMP working on current known technologies, however we will adapt our strategies to incorporate new technologies when appropriate. In the development of our LTDS, we are working to resolve some of this uncertainty and will consider the potential impacts of technology more carefully. Where possible, we will attempt to quantify impacts using the best information available.

There are a range of strategies identified for addressing the risk from water recycling centres. These range in complexity and scale, from customer education, infiltration removal to reduce flows, or larger investment solutions. For many of our water recycling centres we feel the

future risk should be addressed through traditional measures, such as increasing capacity by building more treatment processes, and where appropriate applying for new environmental permits from the Environment Agency. There are some catchments where we have identified a need to monitor catchments together, with the potential to rationalise WRCs by closing one and transferring flow to another. We have identified the potential need to build a new WRC on the west of Norwich, depending on level and location of growth. As well as several WRCs being identified as having the potential to develop a wetland as part of the treatment process, if required in the future.

12.4 Medium term risk catchments

For level 3 catchments where a risk was identified by 2035, we completed a full optioneering process as outlined in 5.8 Options development appraisal. Across all of our catchments a range of the generic options were selected as being feasible. As with those identified in the long term strategy, many of these were solutions which require a level of investment to reduce the risk. However, in some catchments we also felt it would be appropriate to continue to monitor the situation or to complete further investigations before identifying the appropriate strategic pathway.

Many of these strategies proposed where a need is identified in the medium term will either reduce the risk to an acceptable level by 2050 or create an uncertainty that means we need to continue to monitor the catchment post interventions. These catchments will be reviewed in future cycles of the DWMP to understand if further interventions are required.

The identified feasible solutions for each level 3 are outlined below.

12.5 Storm overflows

As outlined in 5.9 Storm overflowswe have reviewed our storm overflows against the Storm Overflow Discharge Reduction Plan. We have included an ambitious plan as part of the Water Industry National Environmental Programme (WINEP) to continue reducing our impact from storm overflows throughout AMP8. We will also work to improve our understanding of performance and impact, to give us confidence that we're investing in the right places at the right time.

Based on our current understanding, our forecast spend on storm overflow is as below. This is included in our DWMP L1 costs:

Table 18 Overview of Storm Overflow costs

Need	Capex cost (£ million)
Investment to reduce spills	1,294
Investigations to understand root cause and need	6.2
Screens	145
Total	1,446

*subject to rounding

12.6 2050 Level 1 costs

2050 Level 1 Costs

Our DWMP suggests that over the next 25 years, investment of up to £5 billion is needed to manage the future risks highlighted in our DWMP, as well as fixing some existing problems. Whilst we anticipate achieving some of these benefits from our base funded usual business maintenance activities, on the whole the DWMP looks at the investment required through our enhancement activities.

This £5 billion plan includes a medium level acceptance of risk including:

- A proportional view of the growth forecast based on both ONS and local authority data.
- Addressing the impact of a 2 degree increase due to climate change in most solutions and the ability to be, prepared for a 4 degree increase in some catchments.
- Least regret options - choosing solutions which can be scaled to meet a range of future scenarios.

Through fantastic engagement with stakeholders throughout the DWMP process we are confident that we can find opportunities to create partnership working for an efficient method of gaining greater benefit. We will continue conversations with our stakeholders to identify and promote options, and to fully understand any complication in the catchments; we welcome further discussions.

This plan indicates the expected level of spend to manage the risk over 25 years, but as outlined in 11. DWMP to PR24 , we will continue to monitor our DWMP strategy and complete further development as part of out LTDS and PR24 submission.

As with all strategic plans, we will continue to monitor the strategy against new information and adapt to ensure we're investing in the right places at the right time.

12.7 Partnership working

As outlined above, surface water removal has been identified as a key strategy for managing the future risk from growth and climate change. We acknowledge that the only way we will be able to achieve this is to work closely with our partners. Through the DWMP discussions we have already identified catchments with potential partnership opportunities, these solutions came out of discussions with stakeholders during workshops in 2022 and are highlighted in our summaries. Continuing these discussions we have identified further areas of opportunities, which will be realised through our PR24 programme.

We have extensive experience in partnership working, and will continue to work with our partners to identify and act on opportunities to work together.

12.8 Alternative plan options

Following DWMP framework, our plan has been created using 6.4 Best Value Planning, and least regret solutions. This provides the widest benefits for the cost and has been agreed through consultation.

Whilst this best value plan takes a medium level of risk with regards to growth and climate change projections, we wanted to understand how the plan would differ if we were to take a more conservative, or adverse view of the future. These adaptive pathways will inform the development of our Long Term Delivery Strategy.

Comparison of scenarios reviewed

Adaptive pathways	25 year view (£bn)	Description	Alignment with expectations
DWMP - Best Value Plan	**5**	**Low regret.** **Most likely growth forecast.** **Mostly 2 degree climate change.** **Solutions based a best value plan decision.** **Storm overflow discharge reduction plan targets met within outlined timeframe.**	**Meets DWMP framework.** **Manages risk.** **Meets green ambitions.** **Supports net zero targets.** **Assumes scope for innovation.**
DWMP - 4 degree scenario	5.7	Least regret. Most likely growth forecast. 4 degree climate change. Storm overflow discharge reduction plan targets met within outlined timeframe.	Meets DWMP framework. Manages risk. Meets green ambitions. Supports net zero targets.
Least cost	2.5	Least cost plan as per optimisation to minimise spend. All overflow solutions grey post AMP8.	Does not meet DWMP requirements. Leaves significant risk. Traditional carbon intensive solutions.
High demand	5.9	Low regret Local authority growth forecast. Mostly 2 degree climate change. Costed on unit rate. Storm overflow discharge reduction plan targets met within outlined timeframe.	Meets DWMP framework. Manages risk. Meets green ambitions. Supports net zero targets.
Low demand	4.9	Low regret ONS growth forecast. Mostly 2 degree climate change. Costed on unit rate. Storm overflow discharge reduction plan targets met within outlined timeframe.	Meets DWMP framework. Leaves some risk. Meets green ambitions. Supports net zero targets.

It is worth noting that given the strategic and adaptive nature of the DWMP we did not review the impact to bills for any of the above scenarios, however this is being reviewed as part of the LTDS, using the Ofwat LTDS guidance in Annex A2.

13. Programme outputs

Here we present the details at each L2 CaBA level. Please use the links below to jump to the relevant CaBA area:

13.1 Ancholme CaBA area

Background

The Ancholme CaBA area covers 22 of our water recycling catchments, 13 of which progressed through the DWMP beyond RBCS.

Ancholme CaBA RBCS

The table below summarises the number of Ancholme CaBA level 3 catchments with triggers in each of the 19 RBCS measures.

Table 19

RBCS measure	Count of level 3 catchments triggering measure
Wastewater resilience metric catchment characterisation	8
Intermittent discharge impacts upon bathing or shellfish waters	0
Continuous or intermittent discharge impacts upon other sensitive receiving waters (part A)	0
Continuous or intermittent discharge impacts upon other sensitive receiving waters (part B)	0
Storm Overflow Assessment Framework (SOAF)	3
Common Assessment Framework (CAF)	0
Internal sewer flooding	0
External sewer flooding	3
Pollution incidents (category 1, 2 and 3)	2
WRC quality compliance	1
WRC DWF compliance	1
Storm overflows	1
Risks from interdependencies between Risk Management Authorities (RMA) systems	2
Planned residential new development	0
The Water Industry National Environment Programme (WINEP)	10
Sewer collapses	3
Sewer blockages	1
WRC biological capacity	3
WRC descriptive permit	2

Ancholme CaBA BRAVA

The BRAVA scores for all level 3 catchments within the Ancholme CaBA area were aggregated to identify a level 2 BRAVA score. The outcome of this is shown in the table below.

As outlined in section 5.5 Baseline Risk and Vulnerability Assessment (BRAVA), risk was assigned a score of 0 = low risk, 1 = medium risk or 2 = high risk.

Table 20

Planning Objective	2020	2050
Flooding in a storm (1 in 50)	0	0
External flooding	0	2
Internal flooding	1	2
Pollution incidents	1	2
Sewer collapses	1	-
DWF compliance	1	2
Quality compliance	0	0
Access to amenity areas	2	2
Green infrastructure	0	0

Ancholme CaBA ODA

The following options have been identified as feasible solutions within the Ancholme CaBA area.

Table 21

Group	Option
Customer side management	Water efficiency - domestic
	Water efficiency - commercial
Combined foul and sewer system	Proactive maintenance - rehabilitation
	Increased conveyance - infra
	Increased capacity - attenuation
	Reduce infiltration
Surface water management	SuDS - public
	Partnership funding
	SuDS - domestic
	SuDS - commercial
Wastewater treatment	Increased capacity - new streams
	Increased capability - new process
Other	Investigate
	Wait and see

Within the Ancholme catchment we have identified that across the 22 level 3 within the area they fall into the following breakdown:

- 9 did not get assessed beyond RBCS.
- 3 present no, or low, risk at 2050.
- 2 where a 2050 strategy only is required.
- 8 where a medium term (by 2035) strategy is required.

The best value plan indicated that we would expect to spend around £40 million over the next 25 years, with around £20 million by 2035.

This assessment is based on current understanding of risk and forecast. We will continue to monitor all catchments, ensuring the strategies are still valid and adjusting our proposed implementation times as and when required.

Ancholme CaBA Level 3 details

Table 22

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy (Previous)	2050 Strategy (Previous)	Partnership opportunities identified
BARNETBY LE WOLD	1788	1918	1945	No	0	-	-	-	-	-
BIGBY	188	215	220	No	0	-	-	-	-	-
BRIGG	7212	7737	7845	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - new permit with increased capacity.	WRC - new permit. 25% surface water removal.	-
BROUGHTON (HUMBER)	5664	6078	6162	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Network - mixed strategies with main solution of SuDS.	25% surface water removal.	-
CAISTOR	3829	4300	4395	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Permit at phosphate TAL.	Network - mixed strategies with main solution of SuDS.	25% surface water removal.	-
CLAXBY	155	176	180	No	0	-	-	-	-	-
DRAGONBY	119	127	129	No	0	-	-	-	-	-
FALDINGWORTH M O D	411	469	481	No	0	-	Potential wetlands opportunity.	-	-	-
GLENTHAM	448	510	523	No	1	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy (Previous)	2050 Strategy (Previous)	Partnership opportunities identified
GRASBY	411	469	480	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	Wait and see.	-
HEMSWELL R A F	818	931	954	Yes	0	WRC compliance Environment and wellbeing	-	WRC - increase capacity.	Wait and see.	-
HIBALDSTOW	5043	5411	5487	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - new permit with increased capacity. Network - mixed strategies with main solution of SuDS.	Infiltration reduction. 25% surface water removal.	-
KIRKBY CUM OSGODBY	319	364	373	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	WRC - increase in capacity.	-
MARKET RASEN	6586	7496	7680	No	1	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy (Previous)	2050 Strategy (Previous)	Partnership opportunities identified
MELTON ROSS	174	187	189	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
NORTH KELSEY	1423	1619	1658	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategies with main solution of SuDs	50% surface water removal.	-
OWMBY	696	794	814	No	0	-	-	WRC - new permit with increased capacity.	-	-
TEALBY	801	905	926	Yes	0	WRC compliance Environment and wellbeing	-	-	Wait and see.	-
THEALBY	481	516	523	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - investigate.	Wait and see.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy (Previous)	2050 Strategy (Previous)	Partnership opportunities identified
WADDINGHAM	791	898	920	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - New Permit Network - Mixed strategies with main solution of SuDs	25% surface water removal.	-
WHITTON	196	210	213	No	0	-	-	-	-	-
WINTERINGHAM	9679	10343	10480	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategies with main solution of SuDs	25% surface water removal.	-

13.2 Broadland CaBA area

Background

The Broadland CaBA area covers 181 of our water recycling catchments, 61 of which progressed through the DWMP beyond RBCS.

Broadland CaBA RBCS

The table below summarises the number of Broadland CaBA level 3 catchments with triggers in each of the 19 RBCS measures.

Table 23

RBCS measure	Count of level 3 catchments triggering measure
Wastewater resilience metric catchment characterisation	76
Intermittent discharge impacts upon bathing or shellfish waters	3
Continuous or intermittent discharge impacts upon other sensitive receiving waters (part A)	0
Continuous or intermittent discharge impacts upon other sensitive receiving waters (part B)	0
Storm Overflow Assessment Framework (SOAF)	5
Common Assessment Framework (CAF)	16
Internal sewer flooding	0
External sewer flooding	5
Pollution incidents (category 1, 2 and 3)	18
WRC quality compliance	0
WRC DWF compliance	13
Storm overflows	2
Risks from interdependencies between Risk Management Authorities (RMA) systems	15
Planned residential new development	17
The Water Industry National Environment Programme (WINEP)	34
Sewer collapses	12
Sewer blockages	8
WRC biological capacity	6
WRC descriptive permit	1

Broadland CaBA BRAVA

The BRAVA scores for all level 3 catchments within the Broadland CaBA area were aggregated to identify a level 2 BRAVA score. The outcome of this is shown in the table below.

As outlined in section 5.5 Baseline Risk and Vulnerability Assessment (BRAVA), risk was assigned a score of 0 = low risk, 1 = medium risk or 2 = high risk.

Table 24

Planning Objective	2020	2050
Flooding in a storm (1 in 50)	0	0
External flooding	0	2
Internal flooding	0	2
Pollution incidents	2	2
Sewer collapses	0	-
DWF compliance	1	1
Quality compliance	0	0
Access to amenity areas	1	1
Green infrastructure	0	0

Broadland CaBA ODA

The following options have been identified as feasible solutions within the Broadland CaBA area.

Table 25

Group	Option
Customer Side Management	Water efficiency - domestic
	Water efficiency - commercial
	Customer education - domestic
	Customer education - commercial
Combined foul and sewer systems	Increased conveyance - infrastructure
	Increased capacity - attenuation
	Transfer between catchments
	Reduce infiltration
Surface water management	New surface water sewerage
	SuDS - public
	Surface water source control - rural
	Partnership funding
	SuDS - domestic
	SuDS - commercial
Wastewater treatment	Improved maintenance
	Process optimisation
	Increased capacity - new streams
	Increased capability - new process
	New treatment works
	Smart consenting
	Wetlands
Other	Investigate
	Wait and see

Broadland CaBA Programme appraisal

Within the Broadland catchment we have identified that across the 181 level 3 within the area they fall into the following breakdown:

- 120 did not get assessed beyond RBCS.
- 23 present no, or low, risk at 2050.
- 5 where a 2050 strategy only is required.
- 33 where a medium term (by 2035) strategy is required.

The best value plan indicated that we would expect to spend around £534 million over the next 25 years, with around £228 million by 2035.

This assessment is based on current understanding of risk and forecast. We will continue to monitor all catchments, ensuring the strategies are still valid and adjusting our proposed implementation times as and when required.

Broadland CaBA Level 3 details

Table 26

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
ACLE	4111	4690	5005	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Climate change impacting river levels and impact on Brundall. On-going work to extend water carriers. NE and EA completed a Diffuse Water Pollution Plan. Saline incursion affects fish in winter.	WRC - increased capacity. Networks - Mixed strategy with main solution of SuDS.	25% surface water removal.	Yes
ALBURGH	206	240	264	No	0	-	-	-	-	-
ALDBOROUGH	1222	1352	1427	Yes	0	WRC compliance Environment and wellbeing	-	WRC - increased capacity.	Customer education.	-
ALDEBY	63	73	81	Yes	0	WRC compliance Environment and wellbeing	-	WRC - increased capacity.	Wait and see.	-
ASHMANAUGH	22	24	25	No	0	-	-	-	-	-
ASHWELLTHORPE	578	673	740	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
AYLSHAM	10229	11677	12466	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Climate change impacting river levels and impact on Aylsham. Habitats (Bure). Flood risk priority catchment.	WRC - New permit with increased capacity.	Customer education.	-
BACTON	863	1020	1066	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - mixed strategies with main solution of SuDs.	50% surface water removal.	-
BARFORD	750	869	953	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - new permit. Networks - mixed Strategies with main solution of SuDs.	50% surface water removal. WRC - increase capacity.	-
BARNHAM BROOM	490	568	623	No	0	-	-	-	-	-
BARSHAM (SUFFOLK)	18	18	18	No	0	-	-	-	-	-
BARTON TURF	54	60	64	No	0	-	-	-	-	-
BECCLES	12465	13239	13695	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Climate change impacting river levels and impact on Beccles. Flood risk priority catchment.	WRC - Increased capacity. Networks - Mixed strategy with main solution of SuDS.	25% surface water removal.	-
BEDFIELD	262	309	323	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - New permit.	Infiltration reduction.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
BELAUGH	9066	10306	10982	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Climate change impacting river levels and impact on Belaugh. Habitats (Bure). Flood risk priority catchment.	-	25% surface water removal.	-
BILLINGFORD	75	73	78	No	0	-	-	-	-	-
BIRCHAM NEWTON	432	439	444	No	0	-	-	-	-	-
BIRCHAM TOFTS	74	73	74	No	0	-	-	-	-	-
BRESSINGHAM	73	83	91	No	0	-	-	-	-	-
BRISLEY	23	22	23	No	0	-	-	-	-	-
BRISTON	2776	3086	3264	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution of SuDS.	50% surface water removal. Customer education.	-
BROCKDISH	552	643	706	No	1	-	-	-	-	-
BUNGAY STW	5227	6237	6408	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Habitats (Waveney).	Networks - Mixed strategy with main solution of SuDS.	25% surface water removal.	-
BUNWELL	93	108	118	No	0	-	-	-	-	-
BURGATE	29	34	35	No	0	-	-	-	-	-
BURSTON	100	117	128	No	0	-	-	-	-	-
BYLAUGH	3354	3735	3917	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution of SuDS.	25% surface water removal.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
CAISTER	108313	116889	120772	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Climate change impacting river levels and impact on Gt Yarmouth. Partnership work already occuring. By 2050 overtopping of flood defences may occur. Potential to work together on the Trinity Broads.	-	Wait and see.	Yes
CANTLEY	524	598	639	No	0	-	-	-	-	-
CARLETON RODE	138	160	175	No	0	-	-	-	-	-
CARLETON RODE	93	107	118	No	0	-	-	-	-	-
CLAXTON THE WARREN	19	22	24	No	0	-	-	-	-	-
COLTISHALL	1791	2042	2179	Yes	0	WRC compliance Environment and wellbeing	-	-	Wait and see.	-
CORPUSTY	604	671	710	No	1	-	Flood risk priority catchment.	-	-	-
COTTON	984	1163	1215	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution of SuDS.	50% surface water removal.	-
CRANWORTH	109	106	112	No	0	-	-	-	-	-
DENHAM	37	43	45	No	0	-	-	-	-	-
DEOPHAM	106	124	136	No	0	-	Habitats (Wensum).	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
DEREHAM	23581	26401	27897	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution of SuDS.	25% surface water removal.	-
DICKLEBURGH	1944	2188	2361	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
DISS	16795	19167	20834	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution of SuDS.	50% surface water removal.	-
DITCHINGHAM	1898	2212	2433	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Habitats.	WRC - Increased capacity. Networks -Mixed strategy with main solution of SuDS.	25% surface water removal. WRC - transfer between catchments.	-
EARSHAM	904	1054	1158	No	0	-	-	-	-	-
EAST BILNEY	77	75	79	No	0	-	-	-	-	-
EAST CARLETON	274	319	351	No	0	-	-	-	-	-
EAST RUSTON	313	347	367	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	Wait and see.	-
EDINGTHOPE	314	315	316	No	0	-	-	-	-	-
ELLINGHAM	1219	1419	1559	No	1	-	Habitats.	-	-	-
EYE	7687	8400	8608	Yes	1	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
FAKENHAM	18073	19434	20216	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Climate change impacting river levels and impact on Belaugh. Habitats (Wensum). Flood risk priority catchment.	Networks - Mixed strategies with main solution of SuDS.	25% surface water removal.	-
FELMINGHAM	86	95	101	No	0	-	-	-	-	-
FERSFIELD	88	100	109	No	0	-	-	-	-	-
FLIXTON	107	104	108	No	0	-	-	-	-	-
FORNCETT - FOURNCETT END	3132	3444	3663	Yes	1	WRC compliance Environment and wellbeing	-	WRC - Increased capacity.	WRC - New permit with increased capacity.	-
FORNCETT ST PETER	113	131	143	No	0	-	Flood risk priority catchment.	-	-	-
FOULSHAM	1378	1372	1454	Yes	1	WRC compliance Environment and wellbeing	Habitats (Wensum).	No risk identified.	No risk identified.	-
FREETHORPE	1461	1670	1784	Yes	1	WRC compliance Environment and wellbeing	Habitats (Halvergate).	WRC - increased capacity.	WRC - New permit with increased capacity.	-
FRESSINGFIELD	15	16	16	No	0	-	-	-	-	-
FRITTON	390	452	496	No	0	-	-	-	-	-
FUNDENHALL	27	31	34	No	0	-	-	-	-	-
GARVESTONE	51	49	52	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
GARVESTONE	51	73	75	No	0	-	-	-	-	-
GATELEY	55	53	56	No	0	-	-	-	-	-
GISLINGHAM	862	1020	1065	Yes	0	WRC compliance Environment and wellbeing	-	WRC - Increased capacity.	Wait and see.	-
GISSING	46	51	54	No	0	-	-	-	-	-
GISSING	61	68	74	No	1	-	-	-	-	-
GRESHAM	453	504	533	No	1	-	-	-	-	-
GT MELTON	23	27	30	No	0	-	-	-	-	-
HARDWICK	15	18	19	No	0	-	-	-	-	-
HARLESTON	6403	7449	8184	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Climate change impacting river levels and impact on Harleston. Habitats. Flood risk priority catchment.	-	25% surface water removal.	-
HELLINGTON	34	40	43	No	0	-	-	-	-	-
HEMPNALL SILVER GREEN	20	23	25	No	0	-	Flood risk priority catchment.	-	-	-
HEMPNALL-FRITTON RD	2814	3278	3603	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Climate change impacting river levels and impact on Hempnall. Flood risk priority catchment.	Networks - Mixed strategies with main solution of SuDS.	50% surface water removal.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
HEYWOOD	86	89	91	No	0	-	-	-	-	-
HILLINGTON				No	0	-	-	-	-	-
HINDOLVESTON	324	358	378	No	0	-	-	-	-	-
HINDOLVESTON-CHURCH LANE	87	94	99	No	0	-	-	-	-	-
HOCKERING	634	837	869	No	0	-	-	-	-	-
HOMERSFIELD	185	182	186	No	1	-	-	-	-	-
HONING	22	24	25	No	0	-	-	-	-	-
HORNING	1217	1349	1425	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Flood risk priority catchment. Diffused Water Pollution Plan. Ongoing work.	WRC - New permit with increased capacity. Networks - Mixed strategy with main solution of SuDS.	25% surface water removal.	Yes
HORNINGTOFT	15	14	15	No	0	-	-	-	-	-
HORSEY	13	14	15	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
HOXNE	634	750	783	No	1	-	-	-	-	-
ILKETSHALL ST ANDREW	69	66	69	No	0	-	-	-	-	-
ILKETSHALL ST MARGARET	61	65	68	No	0	-	-	-	-	-
KIRSTEAD	121	141	155	No	0	-	-	-	-	-
LANGLEY GENTLEMANS WALK	29	33	37	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
LANGLEY GREEN MONKS TERRACE	39	44	49	No	0	-	-	-	-	-
LITTLE FRANSHAM-CROWN LANE	61	59	63	No	1	-	-	-	-	-
LITTLE FRANSHAM-GLEBE HSE	133	173	179	No	0	-	-	-	-	-
LONG STRATTON	6353	7402	8139	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Habitats.	WRC - Increase in capacity. Networks - Mixed strategy with main solution of SuDS.	50% surface water removal.	-
LOWESTOFT	85332	87570	90911	Yes	2	WRC compliance Environment and wellbeing	-	Networks - Attenuation.	25% surface water removal.	-
LUDHAM-WALTON HALL	3423	3786	3995	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Climate change impacting river levels and impact on Ludham. Flood risk priority catchment.	Infiltration reduction. Networks - Mixed strategies with main solution of SuDS.	25% surface water removal.	-
MATTISHALL	3672	4056	4264	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategies with main solution of SuDS.	50% surface water removal.	-
MAUTBY RUNHAM VILLAGE	54	58	60	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	Wait and see.	-
MENDHAM	162	190	199	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
MENDLESHAM	1356	1603	1674	No	0	-	-	-	-	-
MENDLESHAM-WASH LANE	23	27	29	No	0	-	-	-	-	-
METFIELD	292	345	360	No	0	-	-	-	-	-
METTINGHAM	62	60	63	No	0	-	-	-	-	-
NORTH ELMHAM	1261	1317	1390	Yes	1	WRC compliance Environment and wellbeing	Habitats (Wensum).	-	No risk identified.	-
NORTH LOPHAM	186	187	198	No	0	-	-	-	-	-
NORTH TUDDENHAM	30	35	36	No	0	-	-	-	-	-
NORTH WALSHAM	12937	14360	15177	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategies with main solution of SuDS.	Increased conveyance	-
NORTON SUBCOURSE	920	1072	1179	No	0	-	-	-	-	-
NORWICH - WHITLINGHAM TROWSE	308009	328024	336242	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Climate change impacting river levels and impact on Norwich. Habitats (Yare). Recent interegg project completed. Saline incursion being looked at. River habitat improvement work ongoing. Diffuse Water Pollution Plan in progress.	Networks - Attenuation.	WRC - New WRC or infiltration removal, new permit and side stream. 25% surface water removal	Yes

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
OAKLEY	278	329	344	Yes	0	WRC compliance Environment and wellbeing	-	-	Wait and see.	-
PULHAM ST MARY	1697	1977	2174	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategies with main solution of SuDS.	50% surface water removal.	-
RACKHEATH	270	307	327	Yes	0	WRC compliance Environment and wellbeing	-	-	No risk identified.	-
REDGRAVE				No	0	-	-	-	-	-
REDLINGFIELD	22	26	27	No	0	-	-	-	-	-
REEDHAM	1239	1410	1503	No	1	-	Flood risk priority catchment.	-	-	-
REEPHAM (NORFOLK)	4690	5335	5687	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Habitats (Wensum). Permit at phosphorus TAL.	Networks - Mixed strategies with main solution of SuDS.	50% surface water removal. WRC - wetland.	-
REPS WITH BASTWICK	253	274	283	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
RIDLINGTON (NORFOLK)	63	69	73	No	0	-	-	-	-	-
RISHANGLES	4	5	5	No	0	-	-	-	-	-
ROUGHTON	1150	1267	1334	No	0	-	-	-	-	-
RUMBURGH	209	202	210	No	0	-	-	-	-	-
RUSHALL	109	113	115	No	1	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
RUSHALL	101	103	105	No	0	-	-	-	-	-
S ELMHAM ST JAMES	125	120	125	No	1	-	-	-	-	-
S ELMHAM ST MARGARET	17	17	17	No	0	-	-	-	-	-
SAXLINGHAM	2505	2920	3211	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategies with main solution of SuDS.	50% surface water removal.	-
SCULTHORPE-RAF	1202	1332	1407	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Habitats (Wensum).	No risk identified.	Wait and see.	-
SEETHING	72	84	92	No	0	-	-	-	-	-
SHIMPLING	15	17	19	No	0	-	-	-	-	-
SHIPDHAM	1930	2585	2681	No	1	-	-	-	-	-
SHIPMEADOW	105	102	106	No	0	-	-	-	-	-
SHOTESHAM	70	81	90	No	0	-	-	-	-	-
SISLAND	8137	9437	10351	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Habitats.	Networks - Mixed strategy with main solution of SuDS.	25% surface water removal.	-
SKEYTON	28	30	31	No	0	-	-	-	-	-
SLOLEY FRANKFORT	49	55	58	No	0	-	-	-	-	-
SMALLBURGH	100	108	112	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	Wait and see.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
SOMERLEYTON	361	430	443	No	0	-	Climate change impacting river levels and impact on St Olaves.	-	-	-
SOUTH ELMHAM ST CROSS	16	16	16	No	0	-	-	-	-	-
SOUTH LOPHAM	37	36	38	No	1	-	-	-	-	-
SOUTH LOPHAM-	37	36	38	No	1	-	-	-	-	-
SOUTH RAYNHAM	73	78	81	No	0	-	-	-	-	-
SOUTHREPPS	1202	1306	1366	Yes	0	WRC compliance Environment and wellbeing	-	-	Wait and see.	-
SPARHAM - NORWCH RD	35	34	36	No	0	-	-	-	-	-
SPARHAM - WELLS CLOSE	35	34	36	No	0	-	-	-	-	-
SPOONER ROW	103	109	114	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
STALHAM	9429	10250	10722	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Habitats (Ant).	WRC - Increase capacity.	WRC - new permit and increase capacity. 25% surface water removal.	-
STANFIELD	25	24	25	No	0	-	-	-	-	-
STIBBARD	213	237	251	No	0	-	-	-	-	-
STOKE ASH	124	147	153	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - Transfer between catchments.	Wait and see.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
STOKE HOLY CROSS	1521	1771	1947	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategies with main solution of SuDS.	50% surface water removal.	-
STUSTON	44	47	47	No	0	-	-	-	-	-
SWANTON ABBOTT	209	232	245	No	0	-	-	-	-	-
SWANTON MORLEY	1035	1006	1066	No	0	-	Habitats (Wensum).	-	-	-
SWANTON NOVERS	114	127	134	No	0	-	-	-	-	-
SWARDESTON-COMMON	5269	6139	6751	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Climate change impacting river levels and impact on Mulbarton. Lots of culverts in Mulbarton which can become blocked.	Networks - Mixed strategies with main solution of SuDS.	25% surface water removal.	-
SYLEHAM	8	9	9	No	0	-	-	-	-	-
THORNDON-CATBRIDGE	888	1050	1096	Yes	0	WRC compliance Environment and wellbeing	-	-	No risk identified.	-
THWAITE	2	3	3	No	0	-	-	-	-	-
TIBENHAM LONG ROW	25	29	32	No	0	-	-	-	-	-
TIBENHAM THE STREET	10	12	13	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
TOFT MONKS	72	84	92	No	0	-	-	-	-	-
TOPCROFT	35	41	45	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
WEASENHAM ALL SAINTS	39	38	40	No	0	-	-	-	-	-
WEASENHAM ST PETERS	107	250	252	No	0	-	-	-	-	-
WELBOURNE				No	0	-	-	-	-	-
WENDLING	39	38	40	No	0	-	-	-	-	-
WEST RAYNHAM	73	78	81	No	0	-	-	-	-	-
WESTHORPE	161	190	198	No	0	-	-	-	-	-
WEYBREAD	1034	1221	1275	Yes	0	WRC compliance Environment and wellbeing	-	-	No risk identified.	-
WHEATACRE	37	43	48	Yes	0	WRC compliance Environment and wellbeing	-	Wait and see.	Wait and see.	-
WHINBURGH	45	44	46	No	0	-	-	-	-	-
WILBY	23	27	28	No	0	-	-	-	-	-
WINFARTHING CHAPEL CLOSE	22	26	28	No	0	-	-	-	-	-
WINFARTHING GOOSE GREEN	41	48	53	Yes	0	WRC compliance Environment and wellbeing	-	Wait and see.	Wait and see.	-
WINGFIELD	64	75	78	No	0	-	-	-	-	-
WITHERSDALE	57	66	69	No	0	-	-	-	-	-
WOODTON	516	601	661	No	0	-	-	-	-	-
WORLINGHAM-ASHTREE	3299	3286	3407	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategies with main solution of SuDS.	50% surface water removal.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
WORLINGWORTH	578	684	714	No	0	-	-	-	-	-
WORTHAM	106	108	108	No	0	-	-	-	-	-
WORTHAM	107	110	110	No	0	-	-	-	-	-
WYMONDHAM	21152	24318	26542	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Climate change impacting river levels and impact on Wymondham. Flood risk priority catchment.	Wait and see.	Wait and see.	-
WYVERSTONE	245	290	303	No	0	-	Permit at ammonia TAL.	-	-	-

13.3 CamEO CaBA area

Background

The CamEO CaBA area covers 137 of our water recycling catchments, 75 of which progressed through the DWMP beyond RBCS.

CamEO CaBA RBCS

The table below summarises the number of CamEO CaBA level 3 catchments with triggers in each of the 19 RBCS measures.

Table 27

RBCS measure	Count of level 3 catchments triggering measure
Wastewater resilience metric catchment characterisation	45
Intermittent discharge impacts upon bathing or shellfish waters	0
Continuous or intermittent discharge impacts upon other sensitive receiving waters (part A)	0
Continuous or intermittent discharge impacts upon other sensitive receiving waters (part B)	0
Storm Overflow Assessment Framework (SOAF)	1
Common Assessment Framework (CAF)	20
Internal sewer flooding	0
External sewer flooding	4
Pollution incidents (category 1, 2 and 3)	21
WRC quality compliance	1
WRC DWF compliance	15
Storm overflows	12
Risks from interdependencies between Risk Management Authorities (RMA) systems	15
Planned residential new development	12
The Water Industry National Environment Programme (WINEP)	52
Sewer collapses	7
Sewer blockages	18
WRC biological capacity	10
WRC descriptive permit	1

CamEO CaBA BRAVA

The BRAVA scores for all level 3 catchments within the CamEO CaBA area were aggregated to identify a level 2 BRAVA score. The outcome of this is shown in the table below.

As outlined in section 5.5 Baseline Risk and Vulnerability Assessment (BRAVA), risk was assigned a score of 0 = low risk, 1 = medium risk or 2 = high risk.

Table 28

Planning Objective	2020	2050
Flooding in a storm (1 in 50)	0	0
External flooding	0	2
Internal flooding	1	2
Pollution incidents	1	2
Sewer collapses	1	-
DWF compliance	1	1
Quality compliance	0	1
Access to amenity areas	1	1
Green infrastructure	0	0

CamEO CaBA ODA

The following options have been identified as feasible solutions within the CamEO CaBA area.

Table 29

Group	Option
Customer side management	Water efficiency - domestic
	Water efficiency - commercial
	Customer education - domestic
	Customer education - commercial
	Greywater re-use - domestic
	Greywater re-use - commercial
Combined foul and sewer system	Proactive maintenance - cleansing
	Proactive maintenance - rehabilitation
	Increased capacity - attenuation
	Transfer between catchments
	Reduce infiltration
Surface water management	SuDS - public
	Partnership funding
	SuDS - domestic
	SuDS - commercial
Wastewater treatment	Improved maintenance
	Process optimisation
	Increased capacity - new streams
	Increased capability - new process
	Relocate outfalls

Group	Option
	Smart consenting
	Treat / pre-treat trade effluent
	Proactive maintenance - non-infra
Other	Investigate
	Wait and see

CamEO CaBA Programme appraisal

Within the CamEO catchment we have identified that across the 137 level 3 within the area they fall into the following breakdown:

- 62 did not get assessed beyond RBCS.
- 28 present no, or low, risk at 2050.
- 11 where a 2050 strategy only is required.
- 36 where a medium term (by 2035) strategy is required.

The best value plan indicated that we would expect to spend around £461 million over the next 25 years, with around £193 million by 2035.

This assessment is based on current understanding of risk and forecast. We will continue to monitor all catchments, ensuring the strategies are still valid and adjusting our proposed implementation times as and when required.

CamEO CaBA Level 3 details

Table 30

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
ARRINGTON	407	509	576	Yes	0	WRC compliance Environment and wellbeing	-	-	WRC - increased capacity.	-
ASHDON	643	693	750	No	0	-	-	-	-	-
ASHWELL	1890	1875	1932	Yes	0	WRC compliance Environment and wellbeing	-	-	No risk identified.	-
ATTLEBOROUGH	13316	21066	23280	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Permit at phosphate TAL.	WRC - Increased capacity. Networks - Mixed Strategies with main solution of SuDS.	25% surface water removal.	-
ATTLEBOROUGH-POPLAR ROAD	76	76	77	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
AUDLEY END	95	99	102	No	1	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
BADWELL ASH	2382	2816	2943	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed Strategies with main solution of SuDS.	50% surface water removal.	-
BALSHAM	2445	3063	3473	Yes	0	WRC compliance Environment and wellbeing	-	-	Increased conveyance.	-
BARLEY	1333	1670	1893	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - Increased capacity. Networks - Mixed Strategies with main solution of SuDS.	50% surface water removal.	-
BARNHAM	559	549	562	Yes	0	WRC compliance Environment and wellbeing	-	-	No risk identified.	-
BARROW	1627	1655	1693	Yes	1	WRC compliance Environment and wellbeing	-	-	Investigate.	-
BARTON BENDISH	415	407	422	No	0	-	-	-	-	-
BASSINGBOURN	4859	6088	6902	No	0	-	-	-	-	-
BESTHORPE-BUNWELL ROAD	31	30	32	No	0	-	-	-	-	-
BESTHORPE-NORWICH ROAD	79	77	81	No	0	-	-	-	-	-
BLACKHORSE DROVE	280	310	317	No	1	-	-	-	-	-
BLO NORTON	64	67	70	No	0	-	-	-	-	-
BOTESDALE	1689	1997	2087	No	1	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
BOTTISHAM	3958	4622	4786	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - Process optimisation. Networks - Mixed Strategies with main solution of SuDS.	WRC - new permit with increased capacity. 50% surface water removal.	-
BOURN	3489	4291	4823	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Watercourse has potential maintenance requirements.	Infiltration reduction.	WRC - increased capacity.	-
BRADENHAM	587	568	604	No	0	-	Potential wetland opportunity.	-	-	-
BRANDON	10793	11289	11996	Yes	1	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
BRIDGHAM-THE ST S (BIOX)	-	-	-	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
BRIDGHAM-THE STREET NORTH	-	-	-	No	0	-	-	-	-	-
BURWELL	6341	7403	7665	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Habitats.	Networks - Mixed Strategies with main solution of SuDS.	WRC - new permit with increased capacity. Potential to move outfall. 50% surfae water removal.	-
CAMBRIDGE	195680	221384	220965	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - New treatment works. Networks - Attentuation.	10% surface water removal.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
CAMPS	757	947	1072	No	0	-	Potential wetland opportunity.	-	-	-
CARBROOKE-CHURCH END	238	262	275	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed Strategies with main solution of SuDS.	50% surface water removal.	-
CARBROOKE-DRURY LANE	20	19	20	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
CHEDBURGH	1343	1319	1352	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
CHIPPENHAM	471	550	569	No	0	-	Potential wetland opportunity.	-	-	-
COCKLEY CLEY	110	106	113	No	0	-	-	-	-	-
CONEY WESTON	2342	2311	2368	No	0	-	Habitats. Potential wetland opportunity.	-	-	-
COTON	968	1212	1374	Yes	0	WRC compliance Environment and wellbeing	-	Infiltration reduction.	WRC - increase capacity.	-
CROXTON	107	113	119	No	0	-	-	-	-	-
DEBDEN	446	480	519	No	0	-	-	-	-	-
DULLINGHAM	1235	1443	1494	Yes	0	WRC compliance Environment and wellbeing	-	-	WRC - increase capacity.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
DUXFORD	619	772	874	No	0	-	-	-	-	-
EAST HARLING	3154	3659	3814	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategies with main solution of SuDs.	50% surface water removal.	-
ELMDON	920	992	1075	No	0	-	Potential wetland opportunity.	-	-	-
ELMSWELL	7347	8669	9054	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategies with main solution of SuDs.	50% surface water removal.	-
ELY	12332	14324	14815	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	-	WRC - Invesitgate with other Ely WRC. 25% surface water removal	-
ELY-NEW	8926	10371	10728	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - New permit with increased capacity. Networks - Mixed Strategies with main solution of SuDS.	WRC - Invesitgate with other Ely WRC.	-
ERISWELL	1880	1948	2071	No	0	-	-	-	-	-
FELTWELL	2282	2393	2469	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed Strategies with main solution of SuDS.	10% surface water removal.	-
FINCHAM	427	444	458	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
FORDHAM	1847	1885	1948	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed Strategies with main solution of SuDS.	25% surface water removal.	-
FORNHAM ALL SAINTS	84905	85740	86774	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed Strategies with main solution of SuDS.	WRC - investigate. Increase capacity. 25% surface water removal.	-
FOULDEN	416	473	496	No	0	-	-	-	-	-
FOXTON (CAMBS)	6441	8059	9130	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategies with main solution of SuDS.	WRC - new permit with increased capacity. 25% surface water removal.	-
GARBOLDISHAM-BACK LANE	60	58	62	No	0	-	-	-	-	-
GARBOLDISHAM-ELM GROVE	130	146	152	No	0	-	-	-	-	-
GARBOLDISHAM-THE COMMON	34	129	128	No	0	-	-	-	-	-
GASTHORPE	30	29	30	No	0	-	-	-	-	-
GAZELEY	1983	2060	2190	No	0	-	-	-	-	-
GOODERSTONE	574	560	593	No	0	-	-	-	-	-
GREAT CHESTERFORD	3316	3568	3856	Yes	0	WRC compliance Environment and wellbeing	Close to potential new garden community.	-	No risk identified.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
GREAT CRESSINGHAM	312	303	321	No	0	-	-	-	-	-
GREAT ELLINGHAM	715	1598	1614	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	Wait and see.	-
GREAT FEN SOHAM	51	54	55	No	0	-	-	-	-	-
GREAT HOCKHAM	665	748	778	No	0	-	-	-	-	-
GT WHELNETHAM	825	844	863	Yes	1	WRC compliance Environment and wellbeing	-	-	No risk identified.	-
GUILDEN MORDEN	1970	2466	2794	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	Wait and see.	-
HADDENHAM	3153	3680	3810	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Flood risk implications.	Wait and see.	50% surface water runoff removal.	-
HASLINGFIELD	10621	13264	15013	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - New permit. Networks - Attenuation.	25% surface water removal.	
HAWSTEAD	752	748	766	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	Wait and see.	-
HILBOROUGH	178	173	184	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	Wait and see.	-
HOCKWOLD CHURCH LANE	127	148	151	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
HONINGTON	482	474	485	No	0	-	-	-	-	-
ISLEHAM	2279	2661	2756	Yes	0	WRC compliance Environment and wellbeing	-	-	Wait and see.	-
KENNETT	149	174	180	Yes	0	WRC compliance Environment and wellbeing	-	-	No risk identified.	-
KENNINGHALL	285	276	293	No	0	-	-	-	-	-
KIRTLING	224	262	271	No	0	-	-	-	-	-
LAKENHEATH	5488	5688	6050	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategies with main solution of SuDS.	25% surface water removal.	-
LIDGATE	359	352	361	No	0	-	Potential wetland opportunity.	-	-	-
LINTON	7324	9000	10109	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	FCRM priority catchment.	Networks - Mixed strategies with main solution of SuDS.	WRC - increased capacity. 50% surface water removal.	-
LITLINGTON	995	1247	1414	No	0	-	-	-	-	-
LITTLE DOWNHAM	2189	2557	2647	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategies with main solution of SuDS.	50% surface water removal.	-
LITTLE DUNHAM	98	100	106	No	0	-	-	-	-	-
LITTLE ELLINGHAM	-	-	-	No	0	-	-	-	-	-
LITTLE OUSE VILLAGE	139	146	148	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
MELBOURN	7977	9837	11068	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - Transfer between catchments. Networks - Mixed Strategies with main solution of SuDS.	Reduce infiltration. 25% surface water removal.	-
MERTON	38	37	39	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	Wait and see.	-
METHWOLD ELDENS LANE	32	31	32	No	0	-	-	-	-	-
METHWOLD HYTHE	183	176	183	Yes	0	WRC compliance Environment and wellbeing	-	Wait and see.	Wait and see.	-
MILDENHALL	17536	21429	22523	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed Strategies with main solution of SuDS.	50% surface water removal.	-
MUNDFORD	2015	2008	2119	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed Strategies with main solution of SuDS.	25% surface water removal.	-
NECTON	3526	4587	4766	No	0	-	-	-	-	-
NEWMARKET	28195	32663	33765	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	-	WRC - increased capacity. 25% surface water removal.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
NEWPORT	3093	3338	3616	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - Increase capacity and new permit. Infiltration reduction. Networks - Mixed Strategies with main solution of SuDS.	50% surface water removal.	-
NORTHWOLD COMMON DROVE	103	100	103	No	0	-	-	-	-	-
NORTHWOLD GLEBE CLOSE	110	107	110	No	0	-	-	-	-	-
NORTON (SUFFOLK)	882	1043	1090	No	0	-	-	-	-	-
OLD BUCKENHAM	2447	2704	2825	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed Strategies with main solution of SuDS.	25% surface water removal.	-
OVER	13351	16675	18875	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Flood risk implications.	WRC - Increased capacity. Networks - Mixed Strategies with main solution of SuDS.	50% surface water removal.	-
OVINGTON	62	60	64	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
PRICKWILLOW	523	591	608	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
PRICKWILLOW-LARK BANK	212	229	234	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
QUENDON	516	556	602	No	0	-	Potential wetland opportunity.	-	-	-
QUIDENHAM	142	137	146	No	0	-	-	-	-	-
REDGRAVE-CRACKTHORN BRIDGE	421	498	520	No	0	-	-	-	-	-
RIDDLESWORTH WTW	4	4	4	No	0	-	-	-	-	-
ROUDHAM	19	19	20	No	0	-	-	-	-	-
ROUGHAM (ST EDMUNDSBURY)	1235	1215	1243	No	1	-	-	-	-	-
ROYSTON	16151	16017	16522	Yes	0	WRC compliance Environment and wellbeing	-	Wait and see.	WRC - Process optimisation.	-
SAFFRON WALDEN	18273	19599	21106	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	FCRM priority catchment. Flood action group.	Networks - Mixed Strategies with main solution of SuDs.	10% surface water removal.	-
SAWSTON	11881	14814	16755	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed Strategies with main solution of SuDS.	50% surface water removal.	-
SCOULTON	30	32	34	No	0	-	-	-	-	-
SHIPPEA HILL REDMERE	125	130	131	No	0	-	-	-	-	-
SHROPHAM	170	215	223	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	Wait and see.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
SNETTERTON	33	32	34	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
SOHAM	14771	17224	17829	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - New permit with increased capacity. Networks - Mixed Strategies with main solution of SuDS.	50% surface water removal.	-
SOUTHERY-MILL DROVE	1087	1070	1109	Yes	0	WRC compliance Environment and wellbeing	-	-	No risk identified.	-
STANNINGFIELD	380	383	392	No	0	-	-	-	-	-
STANTON	5743	5765	5887	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed Strategies with main solution of SuDS.	50% surface water removal.	-
STOKE FERRY	1258	1700	1724	Yes	0	WRC compliance Environment and wellbeing	-	-	Wait and see.	-
STOW BEDON-MERE ROAD	27	27	27	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
STOW BEDON-STATION ROAD	40	39	41	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
STRETHAM	1851	2155	2230	Yes	0	WRC compliance Environment and wellbeing	-	-	WRC - increase capacity.	-
SWAFFHAM	8671	10983	11428	Yes	0	WRC compliance Environment and wellbeing	-	-	No risk identified.	-
SWAFFHAM PRIOR	663	774	801	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	Wait and see.	-
TADLOW	146	183	208	No	1	-	-	-	-	-
TEN MILE BANK	72	69	72	No	0	-	-	-	-	-
TEVERSHAM	7011	8762	9921	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - Process optimisation. Networks - Mixed Strategies with main solution of SuDS.	50% surface water removal.	-
THETFORD	32140	38922	42358	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Attenuation.	25% surface water removal.	-
THOMPSON	43	42	44	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
THURSTON	6932	8183	8546	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Permit very close to phosphate TAL.	Networks - Mixed Strategies with main solution of SuDS.	50% surface water removal.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
TUDDENHAM	5663	8449	8792	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Permit at ammonia TAL.	Networks - Mixed Strategies with main solution of SuDS.	50% surface water removal.	-
WATERBEACH	7040	8822	10002	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Groundwater ingress a concern. Flooding seen in extreme rainfall.	Networks - Mixed Strategies with main solution of SuDS.	50% surface water removal.	-
WATTISFIELD	589	697	728	No	0	-	-	-	-	-
WATTON	15135	17056	17909	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed Strategies with main solution of SuDS.	25% surface water removal.	-
WEETING	1990	1995	2113	No	0	-	-	-	-	-
WENDENS AMBO	89	96	104	No	0	-	-	-	-	-
WEST DEREHAM	65	63	65	No	0	-	-	-	-	-
WEST STOW	2788	2740	2807	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed Strategies with main solution of SuDS.	50% surface water removal.	-
WEST WICKHAM	818	1022	1157	No	0	-	-	-	-	-
WRESTLINGWORTH	696	675	723	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed Strategies with main solution of SuDS.	50% surface water removal.	-

13.4 East Suffolk CaBA area

Background

The East Suffolk CaBA area covers 78 of our water recycling catchments, 27 of which progressed through the DWMP beyond RBCS.

East Suffolk CaBA RBCS

The table below summarises the number of East Suffolk CaBA level 3 catchments with triggers in each of the 19 RBCS measures.

Table 31

RBCS measure	Count of level 3 catchments triggering measure
Wastewater resilience metric catchment characterisation	48
Intermittent discharge impacts upon bathing or shellfish waters	2
Continuous or intermittent discharge impacts upon other sensitive receiving waters (part A)	0
Continuous or intermittent discharge impacts upon other sensitive receiving waters (part B)	0
Storm Overflow Assessment Framework (SOAF)	2
Common Assessment Framework (CAF)	1
Internal sewer flooding	1
External sewer flooding	1
Pollution incidents (category 1, 2 and 3)	5
WRC quality compliance	3
WRC DWF compliance	4
Storm overflows	3
Risks from interdependencies between Risk Management Authorities (RMA) systems	15
Planned residential new development	1
The Water Industry National Environment Programme (WINEP)	23
Sewer collapses	9
Sewer blockages	18
WRC biological capacity	3
WRC descriptive permit	0

East Suffolk CaBA BRAVA

The BRAVA scores for all level 3 catchments within the East Suffolk CaBA area were aggregated to identify a level 2 BRAVA score. The outcome of this is shown in the table below.

As outlined in section 5.5 Baseline Risk and Vulnerability Assessment (BRAVA), risk was assigned a score of 0 = low risk, 1 = medium risk or 2 = high risk.

Table 32

Planning Objective	2020	2050
Flooding in a storm (1 in 50)	0	0
External flooding	0	2
Internal flooding	0	2
Pollution incidents	1	2
Sewer collapses	2	-
DWF compliance	0	0
Quality compliance	1	1
Access to amenity areas	1	1
Green infrastructure	0	0

East Suffolk CaBA ODA

The following options have been identified as feasible solutions within the East Suffolk CaBA area.

Table 33

Group	Option
Customer side management	Water efficiency - domestic
	Water efficiency - commercial
Combined foul and sewer system	Proactive maintenance - rehabilitation
	Increased capacity - attenuation
	Transfer between catchments
	Reduce infiltration
Surface water management	SuDS - public
	Partnership funding
	SuDS - domestic
	SuDS - commercial
Wastewater treatment	Process optimisation
	Increased capacity - new streams
	Increased capability - new process
	Smart consenting
	Wetlands
	Treat / pre-treat trade effluent
Other	Investigate
	Wait and see

East Suffolk CaBA programme appraisal

Within the East Suffolk catchment we have identified that across the 75 level 3 within the area they fall into the following breakdown:

- 48 did not get assessed beyond RBCS.
- 9 present no, or low, risk at 2050.
- 5 where a 2050 strategy only is required.
- 13 where a medium term (by 2035) strategy is required.

The best value plan indicated that we would expect to spend around £178 million over the next 25 years, with around £72 million by 2035.

This assessment is based on current understanding of risk and forecast. We will continue to monitor all catchments, ensuring the strategies are still valid and adjusting our proposed implementation times as and when required.

East Suffolk CaBA Level 3 details

Table 34

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunity identified?
ALDEBURGH	4228	4056	4141	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategies with main solution of SuDS.	25% surface water removal.	-
ALDERTON	383	408	414	No	0	-	-	-	-	-
ASHBOCKING	20	23	24	No	0	-	-	-	-	-
BENHALL	6033	5768	5894	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategies with main solution of SuDS.	25% surface water removal.	-
BLAXHALL	822	803	819	No	0	-	-	-	-	-
BRAMPTON	91	87	91	No	0	-	-	-	-	-
BRUNDISH	36	41	42	No	0	-	-	-	-	-
CHANTRY	20023	22382	22784	No	1	-	-	-	-	-
CHARSFIELD	312	429	431	No	0	-	Potential wetland opportunity.	-	-	-
CHELMONDISTON	1139	1303	1362	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategies with main solution of SuDS.	10% surface water removal.	-
DEBENHAM	2301	2713	2833	Yes	0	WRC compliance Environment and wellbeing	Flood risk priority catchment. Concerns around climate change.	-	No risk identified.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunity identified?
DUNWICH-BRIDGE FM	306	300	303	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	Wait and see.	-
EARL SOHAM	315	300	307	No	0	-	-	-	-	-
EASTON	202	238	240	No	1	-	-	-	-	-
ELMSETT	670	768	804	Yes	0	WRC compliance Environment and wellbeing	-	-	No risk identified.	-
FELIXSTOWE	35667	42284	43114	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	-	10% surface water removal.	-
FRAMLINGHAM	4178	4060	4149	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - new permit. Network - Mixed strategies with main solution of SuDS.	50% surface water removal.	-
GEDDING	496	587	613	Yes	0	WRC compliance Environment and wellbeing	-	-	No risk identified.	-
GEDGRAVE-CHANTRY MARSHES	921	923	942	No	0	-	-	-	-	-
GIPPING	24	29	30	No	0	-	-	-	-	-
GOSBECK	16	18	19	No	0	-	-	-	-	-
GREAT BRICETT	5	6	6	No	0	-	-	-	-	-
GREAT FINBOROUGH	2055	2430	2539	No	1	-	-	-	-	-
GRUNDISBURGH	1646	1886	1911	No	1	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunity identified?
GT BEALINGS	112	107	109	No	0	-	-	-	-	-
HALESWORTH	7515	7260	7550	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Flood risk priority catchment. Concerns around climate change.	-	25% surface water removal.	-
HAUGHLEY	2641	3018	3128	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategies with main solution of SuDS.	25% surface water removal.	-
HELMINGHAM	15	18	19	No	0	-	-	-	-	-
HENLEY	422	499	522	No	0	-	-	-	-	-
HINTLESHAM	365	416	434	No	0	-	-	-	-	-
HOLLESLEY	2060	2043	2084	Yes	0	WRC compliance Environment and wellbeing	-	-	No risk identified.	-
ILKETSHALL	183	177	184	No	0	-	-	-	-	-
IPSWICH-CLIFF QUAY	146844	164301	167839	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Concerns around climate change.	Wait and see.	10% surface water removal.	-
KENTON	22	26	27	No	0	-	-	-	-	-
KESSINGLAND	6561	6383	6585	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Ongoing project.	Wait and see.	10% surface water removal.	Yes

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunity identified?
KIRTON	1823	1916	1947	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategies with main solution of SuDS.	50% surface water removal.	-
LAXFIELD	20	24	25	No	0	-	-	-	-	-
LEISTON	5836	5573	5696	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Habitats.	-	10% surface water removal.	-
LEVINGTON	210	245	248	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	Wait and see.	-
LITTLE BEALINGS	112	106	109	No	0	-	-	-	-	-
MELTON	6476	6758	6878	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - new permit. Network - Mixed strategies with main solution of SuDS.	WRC - transfer between catchments.	-
MONK SOHAM	25	30	31	No	0	-	-	-	-	-
NEDGING-TYE	145	166	173	No	0	-	-	-	-	-
NEEDHAM MARKET	7058	8336	8708	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Flood risk priority catchment. Concerns around climate change.	Network - Mixed strategies with main solution of SuDS.	50% surface water runoff removal.	-
OFFTON - CASTLE RISE	163	193	202	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunity identified?
OFFTON - MIDDLE WOOD COTTAGES	36	42	44	No	0	-	-	-	-	-
PETTAUGH	66	78	82	No	0	-	-	-	-	-
PLAYFORD	89	85	86	No	0	-	-	-	-	-
RATTLESDEN-WORKHOUSE LN	-	-	-	Yes	0	WRC compliance Environment and wellbeing	-	Wait and see.	Wait and see.	-
REDISHAM	64	62	65	No	0	-	-	-	-	-
RENDLESHAM-PARK	2655	2819	2867	No	0	-	Potential wetland opportunity.	-	-	-
RINGSFIELD	149	144	150	No	0	-	-	-	-	-
RINGSHALL	29	33	34	No	0	-	-	-	-	-
SHOTLEY-OVERHALL FM	1835	2100	2195	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategies with main solution of SuDS.	WRC - process optimisation. 10% surface water removal.	-
SOMERSHAM (SUFFOLK)	1012	1196	1250	No	0	-	Investment ongoing.	-	-	-
SOTHERTON	25	24	25	No	0	-	-	-	-	-
SOUTHWOLD	11324	11114	11352	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Bathing water.	WRC - New process, wetland.	25% surface water removal.	-
SPROUGHTON	1220	1387	1447	No	1	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunity identified?
STONHAM ASPAL	1277	1488	1549	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategies with main solution of SuDS.	50% surface water runoff removal.	-
STOVEN	125	121	126	No	0	-	-	-	-	-
STOWMARKET	24131	28335	29558	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Flood risk priority catchment. Concerns around climate change.	WRC - new permit with increased capacity.	25% surface water removal.	-
SUDBOURNE-	274	261	267	No	0	-	-	-	-	-
THORPENESS	2178	2089	2131	No	0	-	-	-	-	-
TUDDENHAM	1223	1494	1513	Yes	0	WRC compliance Environment and wellbeing	-	Wait and see.	Wait and see.	-
WANGFORD	581	561	584	No	0	-	Habitats.	-	-	-
WENHASTON	1675	1615	1643	No	0	-	Habitats.	-	-	-
WESTHALL	175	169	176	No	0	-	-	-	-	-
WESTLETON	1402	1339	1369	No	0	-	Habitats.	-	-	-
WESTON	35	34	36	No	0	-	-	-	-	-
WETHERDEN	36	43	45	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunity identified?
WICKHAM MARKET	2691	3221	3256	Yes	1	WRC compliance Environment and wellbeing	Flood risk priority catchment. Concerns around climate change.	No risk identified.	No risk identified.	-
WILLINGHAM	96	93	97	No	0	-	-	-	-	-
WOODBRIDGE-CREEK FM	18463	19501	19837	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	25% surface water removal.	-
WRENTHAM	1031	996	1036	No	0	-	Historic flooding. Habitats	-	-	-
YOXFORD	1313	1252	1280	No	1	-	Habitats.	-	-	-

13.5 Essex Rivers Hub CaBA area

Background

The Essex Rivers Hub CaBA area covers 162 of our water recycling catchments, 91 of which progressed through the DWMP beyond RBCS.

Essex Rivers Hub CaBA RBCS

The table below summarises the number of Essex Rivers Hub CaBA level 3 catchments with triggers in each of the 19 RBCS measures.

Table 35

RBCS measure	Count of level 3 catchments triggering measure
Wastewater resilience metric catchment characterisation	103
Intermittent discharge impacts upon bathing or shellfish waters	8
Continuous or intermittent discharge impacts upon other sensitive receiving waters (part A)	0
Continuous or intermittent discharge impacts upon other sensitive receiving waters (part B)	0
Storm Overflow Assessment Framework (SOAF)	12
Common Assessment Framework (CAF)	24
Internal sewer flooding	0
External sewer flooding	5
Pollution incidents (category 1, 2 and 3)	26
WRC quality compliance	3
WRC DWF compliance	9
Storm overflows	9
Risks from interdependencies between Risk Management Authorities (RMA) systems	32
Planned residential new development	12
The Water Industry National Environment Programme (WINEP)	75
Sewer collapses	10
Sewer blockages	33

RBCS measure	Count of level 3 catchments triggering measure
WRC biological capacity	9
WRC descriptive permit	0

Essex Rivers Hub CaBA BRAVA

The BRAVA scores for all level 3 catchments within the Essex Rivers Hub CaBA area were aggregated to identify a level 2 BRAVA score. The outcome of this is shown in the table below.

As outlined in section 5.5 Baseline Risk and Vulnerability Assessment (BRAVA), risk was assigned a score of 0 = low risk, 1 = medium risk or 2 = high risk.

Table 36

Planning Objective	2020	2050
Flooding in a storm (1 in 50)	0	0
External flooding	0	2
Internal flooding	0	2
Pollution incidents	0	2
Sewer collapses	2	-
DWF compliance	1	1
Quality compliance	0	1
Access to amenity areas	1	1
Green infrastructure	0	0

Essex Rivers Hub CaBA ODA

The following options have been identified as feasible solutions within the Essex Rivers Hub CaBA area.

Table 37

Group	Option
Customer side management	Water efficiency - domestic
	Water efficiency - commercial
	Customer education - domestic
	Greywater re-use - domestic
Combined foul and sewer system	Proactive maintenance - rehabilitation
	Increased capacity - attenuation
	Transfer between catchments
	Reduce infiltration
Surface water management	SuDS - public
	Partnership funding
	SuDS - domestic
	SuDS - commercial
Wastewater treatment	Improved maintenance
	Process optimisation
	Increased capacity - new streams
	Smart consenting
	Treat / pre-treat trade effluent
	Proactive maintenance - non-infra
Other	Investigate
	Wait and see

Essex Rivers Hub CaBA programme appraisal

Within the Essex Rivers Hub catchment we have identified that across the 162 level 3 within the area they fall into the following breakdown:

- 71 did not get assessed beyond RBCS.
- 29 present no, or low, risk at 2050.
- 11 where a 2050 strategy only is required.
- 51 where a medium term (by 2035) strategy is required.

The best value plan indicated that we would expect to spend around £836 million over the next 25 years, with around £351 million by 2035.

This assessment is based on current understanding of risk and forecast. We will continue to monitor all catchments, ensuring the strategies are still valid and adjusting our proposed implementation times as and when required.

Essex Rivers Hub CaBA Level 3 details

Table 38

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
ALTON WATER	6	7	7	No	1	-	-	-	-	-
ASHEN	203	198	208	No	0	-	-	-	-	-
BASILDON	131787	129790	127767	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Identified in SWMP.	Network - Mixed Strategy with main solution of SuDS.	10% surface water removal.	-
BAYTHORNE END	65	64	67	No	0	-	-	-	-	-
BELCHAMP ST PAUL	307	302	317	No	0	-	-	-	-	-
BELCHAMP WALTER	113	113	118	No	0	-	-	-	-	-
BENTLEY	546	622	650	No	0	-	-	-	-	-
BILDESTON	1508	1726	1805	No	0	-	-	-	-	-
BILLERICAY	7631	7504	7374	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Permit close to phosphate TAL. Identified in SWMP.	Network - mixed strategies with main solution of SuDS.	10% surface water removal.	-
BIRCH	1008	1084	1165	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Network - mixed strategies with main solution of SuDS..	50% surface water removal.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
BOCKING	22669	28322	29284	Yes	1	WRC compliance Environment and wellbeing	Identified in SWMP.	-	Wait and see.	-
BOXFORD	1655	1887	1971	Yes	1	WRC compliance Environment and wellbeing	Habitats.	-	Wait and see.	-
BRADFIELD ST CLARE	86	84	86	No	0	-	-	-	-	-
BRADWELL ON SEA	715	756	806	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Network - mixed strategies with main solution of SuDS.	50% surface water removal.	-
BRAINTREE	30105	34616	35955	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Identified in SWMP.	Network - mixed strategies with main solution of SuDS.	WRC - increased capacity. 25% surface water removal.	-
BRANTHAM	3226	3696	3867	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Network - mixed strategies with main solution of SuDS.	10% surface water removal.	-
BRENT ELEIGH	49	57	59	No	0	-	-	-	-	-
BRETTENHAM	32	37	39	No	0	-	-	-	-	-
BRIGHTLINGSEA	8530	8445	9369	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Bathing and shellfish water.	Network - mixed strategies with main solution of SuDS.	25% surface water removal.	-
BRINKLEY	354	413	428	No	0	-	-	-	-	-
BROXTED	144	156	169	No	0	-	-	-	-	-
BULMER	236	242	253	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
BULMER TYE	210	216	226	No	0	-	-	-	-	-
BURES-WISSINGTON RD	1484	1701	1780	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	Wait and see.	-
BURNHAM ON CROUCH	8611	9129	9761	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Shellfish water. Concerns around climate change. Jubilee Marsh an important part of catchment.	Network - Mixed strategies with main solution of SuDS.	10% surface water removal.	-
BURROUGH GREEN	237	277	287	No	0	-	-	-	-	-
CHELMSFORD	147157	143610	154103	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Flood risk priority catchment. Identified in SWMP. Concerns around climate change.	-	WRC - prosess optimatisation and increased capacity.	-
CLACTON-HOLLAND HAVEN	46344	45895	50788	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Identified in SWMP.	WRC - New permit and increased capacity.	WRC - investigate strategy with Jaywick. 10% surface water removal.	-
CLARE	3490	3457	3540	No	1	-	-	-	-	-
CLOPTON	5	5	5	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
COCK CLARKS HACKMANS LANE	20	21	23	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
COCKFIELD-GREEN LANE	206	235	246	No	0	-	-	-	-	-
COCKFIELD-MCKENZIE PLACE	56	63	66	No	0	-	-	-	-	-
COCKFIELD-WINDSOR GRN	53	60	62	No	1	-	-	-	-	-
COGGESHALL	10531	13917	14348	Yes	0	WRC compliance Environment and wellbeing	-	Infiltration reduction.	Customer education.	-
COLCHESTER	140797	164214	174887	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Shellfish water. Identified in SWMP. Ongoing projects. Hythe taskforce. Potential garden community.	Wait and see.	Wait and see.	Yes
COPFORD	4884	6110	6469	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Habitats.	WRC - Infiltration reduction / new DWF permit. Network - Mixed strategy with main solution of SuDS.	50% surface water removal.	-
CORNISH	97	97	102	No	1	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
DEDHAM	2265	2427	2608	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Habitats. Flood risk priority catchment. Concerns around climate change.	Network - mixed strategies with main solution of SuDS.	50% surface water removal.	-
DODDINGHURST-	6573	6548	6758	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategies with main solution of SuDS.	25% surface water removal.	-
EARLS COLNE	4477	4770	4979	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - New permit. Network - Mixed strategies with main solution of SuDS.	25% surface water removal.	-
EAST BERGHOLT	2295	2620	2738	Yes	1	WRC compliance Environment and wellbeing	Habitats.	-	No risk identified.	-
EIGHT ASH GREEN	3148	3807	4044	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategies with main solution of SuDS.	50% surface water removal.	-
ERWARTON	36	41	42	No	0	-	-	-	-	-
FELSTED	6417	6915	7481	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - New permit.	Wait and see.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
FINGRINGHOE	2034	2314	2474	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - increase capacity. Network - mixed strategies with main solution of SuDs.	50% surface water removal.	-
FOULNESS	77	84	89	No	0	-	-	-	-	-
FOXEARTH	258	259	271	No	0	-	-	-	-	-
GESTINGTHORPE	146	147	154	No	0	-	-	-	-	-
GLEMSFORD	3942	4514	4721	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Network - mixed strategies with main solution of SuDS.	50% surface water removal.	-
GOOD EASTER	247	241	259	No	0	-	-	-	-	-
GOSFIELD	1283	1417	1475	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Permit close to phosphate TAL.	Network - mixed strategies with main solution of SuDS.	50% surface water removal.	-
GREAT BROMLEY	1188	1177	1301	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Permit at phosphate TAL.	No risk identified.	Wait and see.	-
GREAT CORNARD	8699	9896	10331	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Permit at phosphate TAL.	Network - mixed strategies with main solution of SuDS.	50% surface water removal.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
GREAT DUNMOW	9654	10409	11267	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Infiltration reduction. Network - Mixed strategies with main solution of SuDS.	WRC - increase process capacity. 25% surface water removal.	-
GREAT EASTON (ESSEX)	3564	3843	4160	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Close to potential garden community site.	WRC - New process capacity.	Wait and see.	-
GREAT LEIGHS	2887	5421	5588	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Infiltration reduction.	Wait and see.	-
GREAT MAPLESTEAD	46	50	52	No	0	-	-	-	-	-
GREAT SAMPFORD	1005	1084	1174	Yes	0	WRC compliance Environment and wellbeing	-	WRC - New permit.	Wait and see.	-
GREAT TEY	771	955	1014	No	0	-	-	-	-	-
GREAT TOTHAM	4533	4850	5192	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Identified in SWMP.	No risk identified.	Wait and see.	-
GREAT WENHAM	2966	3399	3556	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	Wait and see.	-
GREAT WIGBOROUGH	141	155	166	No	0	-	-	-	-	-
GREENSTEAD GREEN	353	347	365	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
GROTON-CASTLINGS HEATH	20	23	24	No	0	-	-	-	-	-
GROTON-PARK CORNER	20	23	24	No	0	-	-	-	-	-
GT WALDINGFIELD	2193	2512	2628	No	0	-	-	-	-	-
HADLEIGH	8262	9398	9810	Yes	1	WRC compliance Environment and wellbeing	Habitats. Permit at phosphate TAL.	Infiltration reduction.	Wait and see.	-
HALSTEAD	149	145	152	No	0	-	-	-	-	-
HALSTEAD	17415	18389	19116	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Permit close to phosphate TAL. FCRM catchment. Concerns around climate change.	WRC - New permit. Network - Attenuation.	50% surface water run off removal.	-
HARWICH AND DOVERCOURT	25474	26879	29356	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategies with main solution of SuDS.	25% surface water removal.	-
HAVERHILL	33009	33336	33992	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Permit at phosphate TAL.	WRC - process optimisation. Network - Mixed strategy with main solution of SuDS.	10% surface water removal.	-
HAZELEIGH GOAT LODGE LANE	10	10	11	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
HIGH EASTER	406	437	473	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
HIGH RODING	354	382	414	Yes	0	WRC compliance Environment and wellbeing	-	Wait and see.	WRC - increased capacity.	-
HIGHWOOD	330	322	346	No	0	-	-	WRC - New permit.	-	-
HOLBROOK	1957	2240	2343	Yes	0	WRC compliance Environment and wellbeing	-	Wait and see.	Wait and see.	-
HUNDON	946	929	952	Yes	0	WRC compliance Environment and wellbeing	-	-	No risk identified.	-
HUNDON HALL COTTAGES	10	10	10	No	0	-	-	-	-	-
INGATESTONE	7248	7221	7454	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Network - mixed strategies with main solution of SuDS.	50% surface water removal.	-
JAYWICK NEW	26815	26573	29209	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Flood risk priority catchment. Concern around climate change.	No risk identified.	10% surface water removal.	-
KEDINGTON	2241	2202	2256	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution SuDS.	50% surface water removal.	-
KERSEY	200	229	239	No	0	-	-	-	-	-
KERSEY (THE TYE)	19	21	22	No	0	-	-	-	-	-
LANGHAM (ESSEX)	1848	2190	2332	No	1	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
LATCHINGDON	2728	2896	3101	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Investigation and projects ongoing. Tidal locking concerns with climate change.	WRC - New permit with increased capacity. Network - mixed strategies with main solution of SuDS.	25% surface water removal.	Yes
LAVENHAM	2120	2422	2532	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Network - mixed strategies with main solution of SuDS.	50% surface water removal.	-
LAYER DE LA HAYE	1719	1964	2099	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Habitats.	No risk identified.	Wait and see.	-
LINDSEY-CHURCH RD	18	21	21	No	0	-	-	-	-	-
LINDSEY-FROGS HALL	21	24	25	No	0	-	-	-	-	-
LITTLE BENTLEY	59	58	65	Yes	0	WRC compliance Environment and wellbeing	-	Wait and see.	Wait and see.	-
LITTLE YELDHAM	102	106	111	No	0	-	-	-	-	-
LONG MELFORD	5659	6448	6735	No	1	-	-	-	-	-
LT HORKESLEY	35	38	40	No	0	-	-	-	-	-
LT TOTHAM	715	770	824	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - New permit. Network - Mixed strategies with main solution of SuDS.	WRC - transfer between catchments. 50% surface water removal.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
MALDON	22757	24268	25951	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Shellfish water. Flood risk priority catchment. Identified in SWMP. Concern around climate change. Ongoing projects and investigations. Chelmer and Blackwater partnership.	WRC - Increased capacity. Network - Mixed strategies with main solution of attenuation.	10% surface water removal.	Yes
MANNINGTREE	10315	12365	13429	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - Increased capacity. Network - Mixed strategies with main solution of SuDS.	25% surface water removal.	-
MAYLANDSEA	5287	5592	5963	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategies with main solution of SuDS.	25% surface water removal.	-
MILDEN	21	23	24	No	0	-	-	-	-	-
MONKS ELEIGH	445	510	533	Yes	0	WRC compliance Environment and wellbeing	-	Wait and see.	Wait and see.	-
NAYLAND	3133	3580	3742	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Habitats.	No risk identified.	Wait and see.	-
NEDGING	28	32	34	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
PAGLESHAM-EAST END	338	351	362	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Investigate.	WRC - increase capacity, Potential wetland.	-
PEBMARSH	450	466	487	No	1	-	-	-	-	-
PENTLOW	63	68	71	No	0	-	-	-	-	-
PLESHEY	203	198	212	No	0	-	-	-	-	-
PRESTON ST MARY	80	91	95	No	1	-	-	-	-	-
PURLEIGH	531	563	603	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
RAYLEIGH-EAST	18086	19720	20965	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Shellfish water. Historic flooding. Flood risk priority catchment. Identified in SWMP. Concerns around climate change.	Networks - Mixed strategy with main solution SuDS.	10% surface water removal.	-
RAYLEIGH-WEST	22901	24978	26560	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Shellfish water. Historic flooding. Flood risk priority catchment. Identified in SWMP. Concerns around climate change.	Networks - Mixed strategy with main solution SuDS.	WRC - increase capacity. 25% surface water removal.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
RAYNE	3056	3006	3156	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Identified in SWMP.	WRC - New permit and new side stream. Network - Mixed strategies with main solution of SuDS.	50% surface water removal.	-
RIDGEWELL	492	497	520	No	0	-	Potential wetland opportunity.	-	-	-
RIVENHALL END	156	155	162	No	0	-	-	-	-	-
ROCHFORD	34372	37484	39855	Yes	2	WRC compliance Environment and wellbeing	Shellfish water. Identified in SWMP. Projects ongoing.	Wait and see.	WRC - pro-active mainenance. Increase capacity. 10% surface water removal.	Yes
ROXWELL	730	711	764	No	0	-	-	-	-	-
S WOODHAM FERRERS	19139	18671	20022	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Shellfish water.	Network - Mixed strategies with main solution of SuDS.	WRC - increase capacity. 10% surface water removal.	-
SALCOTT	374	398	421	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Investigate.	WRC - potential wetland.	-
SHALFORD	706	745	778	No	0	-	-	-	-	-
SHENFIELD AND HUTTON	44116	43950	45354	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Identified in SWMP.	Network - Attenuation.	25% surface water removal.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
SHIMPLING	1287	1466	1531	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategies with main solution of SuDS.	50% surface water removal.	-
SIBLE HEDINGHAM	85	83	87	No	0	-	Permit close to phosphate TAL. Flood risk priority catchment.	-	-	-
SIBLE HEDINGHAM	7242	7424	7771	Yes	1	WRC compliance Environment and wellbeing	Concerns around climate change.	-	Wait and see.	-
SOUTHEND	201653	213656	227205	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Identified in SWMP.	Network - Attenuation.	25% infiltration reduction.	-
SOUTHMINSTER	3934	4177	4474	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategies with main solution of SuDS.	WRC - increase capacity. 25% surface water runoff removal.	-
ST OSYTH	7618	7565	8148	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategies with main solution of SuDS.	50% surface water removal.	-
STAMBOURNE	335	334	350	No	0	-	-	-	-	-
STEEPLE BUMPSTEAD	1850	1897	1984	Yes	1	WRC compliance Environment and wellbeing	Flood risk priority catchment. Concerns around climate change.	-	No risk identified.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
STISTED	921	929	973	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
STOKE BY CLARE	390	383	393	No	0	-	-	-	-	-
STONE ST LAWRENCE	1688	1777	1886	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Infiltration reduction. Network - Mixed strategies with main solution of SuDS.	WRC - smart permitting. 10% surface water removal.	-
STRADISHALL-HIGHPOINT	1231	1210	1239	Yes	0	WRC compliance Environment and wellbeing	-	Wait and see.	Wait and see.	-
SUDBURY	15423	17522	18283	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Wait and see.	WRC - Investigate with Great Conard. 25% surface water removal.	-
TENDRING GREEN	55	55	56	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
THORINGTON STREET	98	111	116	No	0	-	Permit at phosphate TAL.	-	-	-
THORPE MORIEUX-BLACKSMITH	31	35	36	No	0	-	-	-	-	-
THORPE MORIEUX-POST OFFICE	36	40	42	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
THORRINGTON	6768	7047	7763	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategies with main solution of SuDS.	10% surface water removal.	-
THURLOW	763	750	769	No	0	-	-	-	-	-
TILLINGHAM	890	945	1012	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	Wait and see.	-
TIPTREE	10819	12143	12999	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution SuDS.	50% surface water removal.	-
TOLLESBURY	2681	2874	3076	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategies with main solution of SuDS.	50% surface water removal.	-
TOLLESHUNT-D ARCY	713	760	814	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	Wait and see.	-
TOPPESFIELD	413	412	432	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
W BERGHOLT	5659	6388	6832	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - New permit.	50% surface water removal.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
WALTON ON THE NAZE	23054	22828	25291	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Impacts bathing water. Concerns of tidal locking from climate change.	Wait and see.	10% surface water removal.	-
WEST MERSEA	9434	10604	11234	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Impacts bathing and shellfish water. Work ongoing.	Network - Mixed strategies with main solution of SuDS.	25% surface water removal.	-
WETHERSFIELD	2888	3052	3188	Yes	1	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
W'HAM MORTIMER POST OFFICE RD	61	65	70	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
WHATFIELD	269	309	323	No	0	-	-	-	-	-
WHITE NOTLEY	4459	5657	5843	Yes	1	WRC compliance Environment and wellbeing	-	Infiltration reduction.	Wait and see.	-
WICKFORD	42577	41859	41132	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Shellfish water. Identified in SWMP.	-	WRC - increase capacity. 25% surfave water removal.	-
WICKHAM ST PAUL	258	274	286	No	0	-	-	-	-	-
WICKHAMBROOK	1670	1641	1681	No	1	-	-	-	-	-
WILLOWS GREEN	143	151	160	No	0	-	-	-	-	-
WIMBISH	148	159	172	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
WITHAM	31882	35955	37242	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Flood risk priority catchment. Identified in SWMP. Concerns around climate change.	No risk identified.	25% surface water removal.	-
WITHERSFIELD	414	407	417	No	0	-	-	-	-	-
WIX	527	521	579	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	Wait and see.	-
WIXOE	103	102	104	No	0	-	-	-	-	-
WOODHAM WALTER	297	318	340	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	Wait and see.	-
WORMINGFORD	359	385	413	No	0	-	-	-	-	-
WRABNESS	28	28	31	No	0	-	-	-	-	-

13.6 Nene Valley CaBA area

Background

The Nene Valley CaBA area covers 81 of our water recycling catchments, 61 of which progressed through the DWMP beyond RBCS.

Nene Valley CaBA RBCS

The table below summarises the number of Nene Valley CaBA level 3 catchments with triggers in each of the 19 RBCS measures.

Table 39

RBCS measure	Count of level 3 catchments triggering measure
Wastewater resilience metric catchment characterisation	35
Intermittent discharge impacts upon bathing or shellfish waters	0
Continuous or intermittent discharge impacts upon other sensitive receiving waters (part A)	0
Continuous or intermittent discharge impacts upon other sensitive receiving waters (part B)	0
Storm Overflow Assessment Framework (SOAF)	3
Common Assessment Framework (CAF)	1
Internal sewer flooding	1
External sewer flooding	3
Pollution incidents (category 1, 2 and 3)	11
WRC quality compliance	3
WRC DWF compliance	4
Storm overflows	3
Risks from interdependencies between Risk Management Authorities (RMA) systems	10
Planned residential new development	18
The Water Industry National Environment Programme (WINEP)	52
Sewer collapses	15
Sewer blockages	9

RBCS measure	Count of level 3 catchments triggering measure
WRC biological capacity	11
WRC descriptive permit	0

Nene Valley CaBA BRAVE

The BRAVA scores for all level 3 catchments within the Nene Valley CaBA area were aggregated to identify a level 2 BRAVA score. The outcome of this is shown in the table below.

As outlined in section 5.5 Baseline Risk and Vulnerability Assessment (BRAVA), risk was assigned a score of 0 = low risk, 1 = medium risk or 2 = high risk.

Table 40

Planning Objective	2020	2050
Flooding in a storm (1 in 50)	0	0
External flooding	0	2
Internal flooding	1	2
Pollution incidents	1	2
Sewer collapses	1	-
DWF compliance	1	1
Quality compliance	1	1
Access to amenity areas	1	1
Green infrastructure	0	0

The following options have been identified as feasible solutions within the Nene Valley CaBA area.

Table 41

Group	Option
Customer side management	Water efficiency - domestic
	Water efficiency - commercial
	Rainwater harvesting - domestic
	Customer education - domestic
Combined foul and sewer system	Proactive maintenance - rehabilitation
	Increased capacity - attenuation
	Transfer between catchments
	Reduce infiltration
Surface water management	SuDS - public
	Partnership funding
	SuDS - domestic
	SuDS - commercial
Wastewater treatment	Increased capacity - new streams
	New treatment works
	Relocate outfalls
	Smart consenting
	Treat / pre-treat trade effluent
Other	Wait and see

Nene Valley CaBA programme appraisal

Within the Nene Valley catchment we have identified that across the 81 level 3 within the area they fall into the following breakdown:

- 21 did not get assessed beyond RBCS.
- 28 present no, or low, risk at 2050.

- 6 where a 2050 strategy only is required.
- 27 where a medium term (by 2035) strategy is required.

The best value plan indicated that we would expect to spend around £258 million over the next 25 years, with around £131 million by 2035.

This assessment is based on current understanding of risk and forecast. We will continue to monitor all catchments, ensuring the strategies are still valid and adjusting our proposed implementation times as and when required.

Nene Valley CaBA Level 3 details

Table 42

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
BARNWELL	755	843	913	Yes	1	-	Historic flooding.	-	-	-
BENEFIELD	357	397	430	Yes	1	WRC compliance Environment and wellbeing	-	-	No risk identified.	-
BOZEAT	2267	2244	2394	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - New permit and increased capacity. Network - Mixed strategy with main solution of SuDS.	25% surface water removal.	-
BRIGSTOCK	1427	1594	1726	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Concern of climate change and flood risk.	Network - Mixed strategies with main solution of SuDS.	25% surface water removal.	-
BRINGTON	559	594	668	Yes	0	WRC compliance Environment and wellbeing	-	-	Wait and see.	-
BRIXWORTH	7238	8106	9045	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Permit at phosphate TAL.	Network - Mixed strategy with main solution of SuDS.	25% surface water removal.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
BROADHOLME	229169	256689	269592	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Permit at phosphate TAL.	WRC - Increased capacity Network - Attenuation.	10% surface water removal.	-
BROUGHTON (NORTHANTS)	4644	5483	5938	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - Increased capacity. Network - mixed strategies with main solution of SuDS.	25% surface water removal.	-
BUGBROOKE	8648	9482	10240	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategies with main solution of SuDS.	25% surface water removal.	-
CASTLE ASHBY	159	161	175	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
CLIPSTON	705	750	842	Yes	0	WRC compliance Environment and wellbeing	SSSI	-	Wait and see.	-
CORBY	134137	151224	159615	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Permit at phosphate and ammonia TAL.	WRC - New permit with increased capacity.	Wait and see.	-
COURTEENHALL	90	91	100	No	0	-	-	-	-	-
COWBIT	2376	3150	3213	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
CRANFORD	486	573	620	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Concern of climate change and flood risk. Link to brook and drainage.	Wait and see.	Wait and see.	-
CREATON	858	925	1025	Yes	1	WRC compliance Environment and wellbeing	-	-	Wait and see.	-
CROWLAND	4152	5513	5623	Yes	1	WRC compliance Environment and wellbeing	Increased river levels likely. Potential scheme on going.	WRC - Increased capacity.	Wait and see.	-
DEENETHORPE	96	107	116	No	0	-	-	-	-	-
DRAUGHTON	483	513	576	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	Wait and see.	-
EAST HADDON	751	809	906	Yes	0	WRC compliance Environment and wellbeing	-	WRC - Increased capacity.	Wait and see.	-
EASTON MAUDIT	47	46	49	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
ELTON	739	709	744	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
EVERDON	412	438	492	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
GAYTON (S NORTHANTS)	598	618	671	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategies with main solution of SuDS.	25% surface water removal.	-
GEDDINGTON	1694	2003	2170	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategy with main solution of SuDS.	Reduce infiltration. Transfer between catchments.	-
GEDNEY DROVE END HOLBOURN	234	244	252	No	0	-	-	-	-	-
GEDNEY DYKE	54	52	54	No	0	-	-	-	-	-
GRAFTON UNDERWOOD	146	173	187	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Fluvial risk.	-	Wait and see.	-
GREAT BILLING	305500	323803	329473	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Wait and see.	WRC - increase capacity 10% surface water removal.	-
GREAT DODDINGTON	1151	1139	1215	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	-	Wait and see.	-
GREAT OXENDON	716	761	854	Yes	0	WRC compliance Environment and wellbeing	SSSI	WRC - Increased capacity.	Wait and see.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
GRENDON	499	505	538	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	-	Wait and see.	-
HACKLETON	2198	2377	2570	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategies with main solution of SuDS.	50% surface water removal.	-
HANGING HOUGHTON	125	132	149	No	0	-	-	-	-	-
HARDWICK	32	32	34	No	0	-	-	-	-	-
HARRINGTON	118	139	150	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	SSSI	No risk identified.	No risk identified.	-
HOLDENBY	44	47	53	No	0	-	-	-	-	-
HOLLOWELL	1617	1776	1987	No	0	-	Permit at phosphate TAL.	-	-	-
ISLIP	13054	14406	15478	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Investigations ongoing. Projects in Harpers Brook.	Infiltration reduction.	10% surface water removal.	Yes
KINGSCLIFFE	1223	1366	1479	Yes	0	WRC compliance Environment and wellbeing	Concern of climate change and flood risk.	-	No risk identified.	-
LAMPORT	140	149	168	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
LITCHBOROUGH	577	591	643	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
LITTLE ADDINGTON	605	675	730	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Wait and see.	Wait and see.	-
LODDINGTON	398	471	510	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - Increase capacity.	Wait and see.	-
LONG BUCKBY	7318	10740	11624	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - Increase Capacity. Network - Mixed strategies with main solution of SuDS.	25% surface water removal.	-
LUTTON	153	171	185	No	0	-	-	-	-	-
MOULTON	4387	5763	5880	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	-	Reduce infiltration. Transfer between catchments.	-
NASSINGTON	1063	1187	1284	Yes	1	WRC compliance Environment and wellbeing	-	-	WRC - increase capacity Customer education. Water efficiency.	-
NEWNHAM (NORTHANTS)	1337	1430	1605	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategies with main solution of SuDS.	25% surface water removal.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
NORTON (NORTHANTS)	399	424	475	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
OUNDLE	6208	6929	7500	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategies with main solution of SuDS.	25% surface water removal.	-
PARSON DROVE	429	486	518	Yes	0	WRC compliance Environment and wellbeing	-	-	No risk identified.	-
PETERBOROUGH	228275	250854	266199	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Flood risk implications. Multiple areas of interest.	Network - Attenuation.	10% surface water removal.	-
PODINGTON	313	311	332	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
PRESTON CAPES ST	165	175	197	Yes	0	WRC compliance Environment and wellbeing	-	-	No risk identified.	-
PYTCHLEY	491	581	629	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	Wait and see.	-
QUINTON	165	168	183	No	0	-	Historic flooding.	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
RAUNDS	12252	13683	14815	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Investigations ongoing.	WRC - Relocate outfall.	Wait and see.	Yes
RAVENSTHORPE	794	845	950	Yes	1	WRC compliance Environment and wellbeing	-	Wait and see.	Customer education.	-
RUSHTON	440	510	547	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	SSSI	WRC - Increased capacity.	Wait and see.	-
STANION	1064	1770	1881	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	-	Wait and see.	-
STIBBINGTON	1632	1590	1647	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategies with main solution of SuDS.	50% surface water removal.	-
SUTTON BRIDGE	18496	20687	21140	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategies with main solution of SuDS.	50% surface water removal.	-
SUTTON ST JAMES SUTTON GATE	183	179	185	No	0	-	-	-	-	-
SUTTON ST JAMES-NEEDHAM DR ST	201	409	407	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
TERRINGTON ST CLEMENTS	58	56	58	No	0	-	-	-	-	-
THORNEY	2254	2456	2552	Yes	0	WRC compliance Environment and wellbeing	Historic flooding.	No risk identified.	No risk identified.	-
THORPE MALSOR	140	166	180	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - Increase capacity.	Wait and see.	-
TITCHMARSH	539	600	649	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategies with main solution of SuDS.	25% surface water removal.	-
UPTON	46	44	46	No	0	-	Historic flooding.	-	-	-
WALPOLE ST ANDREW	111	174	176	No	0	-	-	-	-	-
WALPOLE ST PETER	62	60	62	No	0	-	-	-	-	-
WARMINGTON	969	1081	1171	No	0	-	-	-	-	-
WATFORD	290	309	347	No	0	-	-	-	-	-
WEEDON	3645	3988	4461	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - New permit with increased capacity. Network - Mixed strategy with main solution of SuDS.	25% surface water removal.	-
WELTON (NORTHANTS)	719	765	860	Yes	0	WRC compliance Environment and wellbeing	-	-	No risk identified.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
WEST WALTON	114071	119746	122948	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Flood risk implications.	Network - Mixed strategy with main solution of SuDS.	25% infiltration reduction.	-
WHILTON	32506	46567	50356	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - Increase capacity.	Wait and see.	-
WITTERING	4741	4966	5184	Yes	0	WRC compliance Environment and wellbeing	Mapping share available.	Wait and see.	WRC - process optimisation Increase WRC capacity - new process.	-
WOODNEWTON	578	646	699	Yes	0	WRC compliance Environment and wellbeing	-	-	No risk identified.	-
YARDLEY HASTINGS	1803	1885	2047	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategies with main solution of SuDS.	25% surface water removal.	-

13.7 North Norfolk CaBA area

Background

The North Norfolk CaBA area covers 21 of our water recycling catchments, 9 of which progressed through the DWMP beyond RBCS.

North Norfolk CaBA RBCS

The table below summarises the number of North Norfolk CaBA level 3 catchments with triggers in each of the 19 RBCS measures.

Table 43

RBCS measure	Count of level 3 catchments triggering measure
Wastewater resilience metric catchment characterisation	11
Intermittent discharge impacts upon bathing or shellfish waters	1
Continuous or intermittent discharge impacts upon other sensitive receiving waters (part A)	0
Continuous or intermittent discharge impacts upon other sensitive receiving waters (part B)	0
Storm Overflow Assessment Framework (SOAF)	2
Common Assessment Framework (CAF)	0
Internal sewer flooding	1
External sewer flooding	0
Pollution incidents (category 1, 2 and 3)	4
WRC quality compliance	1
WRC DWF compliance	1
Storm overflows	2
Risks from interdependencies between Risk Management Authorities (RMA) systems	4
Planned residential new development	1
The Water Industry National Environment Programme (WINEP)	7
Sewer collapses	4
Sewer blockages	5

RBCS measure	Count of level 3 catchments triggering measure
WRC biological capacity	1
WRC descriptive permit	0

North Norfolk CaBA BRAVA

The BRAVA scores for all level 3 catchments within the North Norfolk CaBA area were aggregated to identify a level 2 BRAVA score. The outcome of this is shown in the table below.

As outlined in section 5.5 Baseline Risk and Vulnerability Assessment (BRAVA), risk was assigned a score of 0 = low risk, 1 = medium risk or 2 = high risk.

Table 44

Planning Objective	2020	2050
Flooding in a storm (1 in 50)	0	0
External flooding	0	2
Internal flooding	0	2
Pollution incidents	1	2
Sewer collapses	1	-
DWF compliance	1	1
Quality compliance	1	1
Access to amenity areas	1	1
Green infrastructure	0	0

North Norfolk CaBA ODA

The following options have been identified as feasible solutions within the North Norfolk CaBA area.

Table 45

Group	Option
Customer side management	Water efficiency - domestic
	Water efficiency - commercial
	Greywater re-use - commercial
Combined foul and sewer systems	Proactive maintenance - rehabilitation
	Increased capacity - attenuation
	Transfer between catchments
	Reduce infiltration
Surface water management	SuDS - public
	Partnership funding
	SuDS - domestic
	SuDS - commercial
Wastewater treatment	Process optimisation
	Relocate outfalls
	Treat / pre-treat trade effluent
Other	Wait and see

North Norfolk CaBA programme appraisal

Within the North Norfolk catchment we have identified that across the 21 level 3 within the area they fall into the following breakdown:

- 12 did not get assessed beyond RBCS.
- 2 present no, or low, risk at 2050.
- 2 where a 2050 strategy only is required.
- 5 where a medium term (by 2035) strategy is required.

The best value plan indicated that we would expect to spend around £43 million over the next 25 years, with around £20 million by 2035.

This assessment is based on current understanding of risk and forecast. We will continue to monitor all catchments, ensuring the strategies are still valid and adjusting our proposed implementation times as and when required.

North Norfolk CaBA Level 3 details

Table 46

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
BACONSTHORPE-HALL RD HSW	152	168	177	No	0	-	-	-	-	-
BARNEY-STIBBARD RD STW	-	-	-	No	0	-	-	-	-	-
BARSHAM-GT SNORING RD HSW NFLK	124	131	135	No	1	-	FCRM priority catchment.	-	-	-
BURNHAM MARKET	5335	5275	5452	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Flood risk priority catchment. Shellfish water.	WRC - Increased Capacity. Networks - Mixed strategies with main solution of SuDs.	25% surface water removal.	-
CLEY-GLANDFORD RD	2565	2814	2957	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Flood risk priority catchment. Shellfish water. Concern on impact of climate change.	Wait and see.	WRC - Transfer between catchments or relocate outfall Networks - 25% surface water removal.	-
CROMER	28045	30707	32235	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Flood risk priority catchment. Concern on impact of climate change.	WRC - Increase capacity. Networks - Increase capacity	10% surface water removal.	-
EDGEFIELD-TURKEY LN HSW	83	92	97	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
GREAT WALSINGHAM	1264	1401	1480	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	-	Wait and see.	-
GUNTHORPE HSW	37	38	39	No	0	-	-	-	-	-
HOLT-MAIN ROAD	6644	7261	7616	Yes	0	WRC compliance Environment and wellbeing	Flood risk priority catchment. Concern on impact of climate change.	No risk identified.	Wait and see.	-
LANGHAM (NORFOLK)	1320	1463	1545	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - New permit.	Wait and see.	-
LITTLE SNORING	1447	1599	1686	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	-	Infiltration reduction.	-
MUNDESLEY-KNAPTON ROAD	7494	8232	8657	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Flood risk priority catchment. Concern on impact of climate change.	WRC - Increased capacity. Networks - Mixed strategies with main solution of SuDS.	25% surface water removal.	-
NORTHREPPS-FROGS HALL STW	665	737	778	No	1	-	-	-	-	-
SHARRINGTON HSW	27	28	29	No	0	-	-	-	-	-
STANHOE STATION ROAD STW	67	66	67	No	1	-	-	-	-	-
STIFFKEY-NR POLICE ST HSW	136	144	149	No	0	-	Flood risk priority catchment.	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
THURSFORD-NORTH LANE HSW	43	47	48	No	1	-	-	-	-	-
TRUNCH-N WALSHAM RD HSW	169	187	198	No	0	-	-	-	-	-
WARHAM-BINHAM ROAD STW	94	104	109	No	0	-	-	-	-	-
WELLS-FREEMAN STREET	4011	4361	4562	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Bathing water and shellfish water.	Networks - Mixed strategies with main solution SuDS.	25% surface water removal.	-

13.8 North West Norfolk CaBA area

Background

The North West Norfolk CaBA area covers 30 of our water recycling catchments, 12 of which progressed through the DWMP beyond RBCS.

North West Norfolk CaBA RBCS

The table below summarises the number of North West Norfolk CaBA level 3 catchments with triggers in each of the 19 RBCS measures.

Table 47

RBCS measure	Count of level 3 catchments triggering measure
Wastewater resilience metric catchment characterisation	12
Intermittent discharge impacts upon bathing or shellfish waters	2
Continuous or intermittent discharge impacts upon other sensitive receiving waters (part A)	0
Continuous or intermittent discharge impacts upon other sensitive receiving waters (part B)	0
Storm Overflow Assessment Framework (SOAF)	2
Common Assessment Framework (CAF)	1
Internal sewer flooding	1
External sewer flooding	2
Pollution incidents (category 1, 2 and 3)	2
WRC quality compliance	0
WRC DWF compliance	1
Storm overflows	1
Risks from interdependencies between Risk Management Authorities (RMA) systems	7
Planned residential new development	7
The Water Industry National Environment Programme (WINEP)	6
Sewer collapses	1
Sewer blockages	7

RBCS measure	Count of level 3 catchments triggering measure
WRC biological capacity	2
WRC descriptive permit	0

North West Norfolk CaBA BRAVA

The BRAVA scores for all level 3 catchments within the North West Norfolk CaBA area were aggregated to identify a level 2 BRAVA score. The outcome of this is shown in the table below.

As outlined in section 5.5 Baseline Risk and Vulnerability Assessment (BRAVA), risk was assigned a score of 0 = low risk, 1 = medium risk or 2 = high risk.

Table 48

Planning Objective	2020	2050
Flooding in a storm (1 in 50)	0	0
External flooding	0	2
Internal flooding	0	2
Pollution incidents	0	2
Sewer collapses	1	-
DWF compliance	0	0
Quality compliance	1	1
Access to amenity areas	1	1
Green infrastructure	0	0

North West Norfolk CaBA ODA

The following options have been identified as feasible solutions within the North West Norfolk CaBA area.

Table 49

Group	Option
Customer side management	Water efficiency - domestic
	Water efficiency - commercial
Combined foul and sewer system	Proactive maintenance - rehabilitation
	Increased capacity - attenuation
	Reduce infiltration
Surface water management	SuDS - public
	Partnership funding
	SuDS - domestic
	SuDS - commercial
Other	Wait and see

North West Norfolk CaBA programme appraisal

Within the North West Norfolk catchment we have identified that across the 30 level 3 within the area they fall into the following breakdown:

- 18 did not get assessed beyond RBCS
- 6 present no, or low, risk at 2050
- 1 where a 2050 strategy only is required
- 5 where a medium term (by 2035) strategy is required

The best value plan indicated that we would expect to spend around £53 million over the next 25 years, with around £21 million by 2035.

This assessment is based on current understanding of risk and forecast. We will continue to monitor all catchments, ensuring the strategies are still valid and adjusting our proposed implementation times as and when required.

North West Norfolk CaBA Level 3 details

Table 50

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
BARROWAY DROVE HOOTENS ROW STW	73	71	73	No	0	-	-	-	-	-
BEESTON-BITT-DYKEWOOD FARM STW	285	309	324	No	0	-	-	-	-	-
CASTLE ACRE STW	-	-	-	No	0	-	-	-	-	-
DOWNHAM MARKET STW	11921	12971	13347	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategy with main solution of SuDS.	25% surface water removal.	-
EAST WINCH STW	638	633	652	No	0	-	-	-	-	-
FLITCHAM ABBEY ROAD STW	6	6	6	No	0	-	-	-	-	-
GAYTON WTW STW (NORFOLK)	185	185	185	No	0	-	-	-	-	-
GREAT BIRCHAM FRING ROAD STW	161	180	183	No	0	-	-	-	-	-
GREAT DUNHAM-NORTH STREET STW	8	8	8	No	0	-	-	-	-	-
GREAT DUNHAM-SOUTH STREET STW	83	80	85	No	0	-	-	-	-	-
GRIMSTON STW	4194	4441	4574	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategy with main solution of SuDS.	25% surface water removal.	-
HARPLEY STW	1410	1399	1449	No	0	-	-	-	-	-
HEACHAM STW	22639	23795	24387	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Bathing water.	Network - Mixed strategy with main solution of SuDS.	50% surface water removal.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
INGOLDISTHORPE STW	6667	6600	6833	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Wait and see.	10% surface water removal.	-
KINGS LYNN STW	67877	74890	77153	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	-	-	Wait and see.	-
LEZIATE STW	202	195	202	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	Wait and see.	-
LITCHAM STW	1455	1461	1547	No	0	-	SSSI	-	-	-
MARHAM + SCHOOL HILLSIDE STW	271	466	464	No	0	-	-	-	-	-
MARHAM STW	183	182	183	No	0	-	SSSI	-	-	-
MIDDLETON STW (NORFOLK)	1517	1499	1553	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategy with main solution of SuDS.	25% surface water removal.	-
NARBOROUGH STW	1212	1385	1452	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
PENTNEY BILNEY ROAD STW	203	197	204	No	0	-	-	-	-	-
ROUGHAM COUNCIL HOUSES STW	26	25	27	No	0	-	-	-	-	-
SALTERS LODE WATERMANS WAY STW	62	60	62	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Flood risk implications.	No risk identified.	Wait and see.	-
SHOULDHAM STW	516	511	530	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
TILNEY ALL SAINTS GLEBE ESTATE STW	178	192	196	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
WALPOLE ST PETER WEST DROVE NORTH STW	52	50	52	No	0	-	-	-	-	-
WATLINGTON STW	4722	4748	4913	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategy with main solution of SuDS.	WRC - Investigate. 25% surface water removal.	-
WEST ACRE RIVER ROAD STW	49	47	49	Yes	0	WRC compliance Environment and wellbeing	SSSI	No risk identified.	No risk identified.	-
WORMEGAY HILL ESTATE STW	113	109	113	No	0	-	-	-	-	-

13.9 Northern Becks CaBA area

Background

The Northern Becks CaBA area covers 24 of our water recycling catchments, 16 of which progressed through the DWMP beyond RBCS.

Northern Becks CaBA RBCS

The table below summarises the number of Northern Becks CaBA level 3 catchments with triggers in each of the 19 RBCS measures.

Table 51

RBCS measure	Count of level 3 catchments triggering measure
Wastewater resilience metric catchment characterisation	12
Intermittent discharge impacts upon bathing or shellfish waters	0
Continuous or intermittent discharge impacts upon other sensitive receiving waters (part A)	0
Continuous or intermittent discharge impacts upon other sensitive receiving waters (part B)	0
Storm Overflow Assessment Framework (SOAF)	3
Common Assessment Framework (CAF)	2
Internal sewer flooding	2
External sewer flooding	0
Pollution incidents (category 1, 2 and 3)	3
WRC quality compliance	2
WRC DWF compliance	1
Storm overflows	1
Risks from interdependencies between Risk Management Authorities (RMA) systems	6
Planned residential new development	1
The Water Industry National Environment Programme (WINEP)	13
Sewer collapses	4
Sewer blockages	6

RBCS measure	Count of level 3 catchments triggering measure
WRC biological capacity	3
WRC descriptive permit	0

Northern Becks CaBA BRAVA

The BRAVA scores for all level 3 catchments within the Northern Becks CaBA area were aggregated to identify a level 2 BRAVA score. The outcome of this is shown in the table below.

As outlined in section 5.5 Baseline Risk and Vulnerability Assessment (BRAVA), risk was assigned a score of 0 = low risk, 1 = medium risk or 2 = high risk.

Table 52

Planning Objective	2020	2050
Flooding in a storm (1 in 50)	0	0
External flooding	0	2
Internal flooding	0	2
Pollution incidents	0	2
Sewer collapses	1	-
DWF compliance	0	0
Quality compliance	1	1
Access to amenity areas	1	1
Green infrastructure	1	1

Northern Becks CaBA ODA

The following options have been identified as feasible solutions within the Northern Becks CaBA area.

Table 53

Group	Option
Customer side management	Water efficiency - domestic
	Water efficiency - commercial
	Customer education - domestic
Combined foul and sewer systems	Proactive maintenance - rehabilitation
	Increased capacity - attenuation
	Reduce infiltration
Surface water removal	SuDS - public
	Partnership funding
	SuDS - domestic
	SuDS - commercial
Wastewater treatment	Increased capacity - new streams
Other	Investigate
	Wait and see

Northern Becks CaBA programme appraisal

Within the Northern Becks catchment we have identified that across the 24 level 3 within the area they fall into the following breakdown:

- 8 did not get assessed beyond RBCS
- 8 present no, or low, risk at 2050
- 5 where a 2050 strategy only is required
- 3 where a medium term (by 2035) strategy is required

The best value plan indicated that we would expect to spend around £12 million over the next 25 years, with around £6 million by 2035.

This assessment is based on current understanding of risk and forecast. We will continue to monitor all catchments, ensuring the strategies are still valid and adjusting our proposed implementation times as and when required.

Northern Becks CaBA Level 3 details

Table 54

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
BARTON ON HUMBER	14621	15472	15647	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Mixed strategy with main solution of SuDS.	50% infiltration reduction.	-
BINBROOK	1534	1750	1793	Yes	0	WRC compliance Environment and wellbeing	Groundwater flooding.	No risk identified.	No risk identified.	-
BROCKLESBY	61	70	72	No	0	-	-	-	-	-
COVENHAM PACKAGED	17	17	18	No	1	-	-	-	-	-
EAST RAVENDALE	43	42	42	No	0	-	-	-	-	-
GRIMSBY-PYEWIPE	149543	151414	151277	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Groundwater ingress concerns. Bathing water.	No risk identified.	Wait and see.	-
HOLTON LE CLAY	3755	4288	4549	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Wait and see.	50% surfae water runoff removal.	-
IMMINGHAM NEW	12513	13089	13061	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Surface water issues.	-	5% surface water removal.	-
KEELBY	2384	2719	2787	Yes	0	WRC compliance Environment and wellbeing	-	Wait and see.	Wait and see.	-
KIRMINGTON	673	722	732	No	0	-	Permit at phosphate TAL.	-	-	-
LACEBY	3037	3357	3344	Yes	1	WRC compliance Environment and wellbeing	Permit at phosphate TAL.	-	No risk identified.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
LOUTH	21215	23329	24755	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Permit close to phosphate TAL. Fluvial risk. Investigations ongoing.	Wait and see.	WRC - new permit and increase capacity. 10% surface water removal.	-
NORTH COTES	1647	1798	1915	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
NORTH COTES (RAF)	90	90	97	Yes	1	WRC compliance Environment and wellbeing	-	-	Wait and see.	-
NORTH FERRY	5600	6008	6092	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Groundwater ingress concerns.	WRC - New permit with increase capacity.	Wait and see.	-
NORTH SOMERCOTES	1346	1355	1455	Yes	0	WRC compliance Environment and wellbeing	-	WRC - Increased capacity.	WRC - new permit and increase capacity.	-
NORTH THORESBY	1165	1378	1457	Yes	0	WRC compliance Environment and wellbeing	-	-	Wait and see.	-
ROTHWELL (LINCS)	176	201	206	No	0	-	Groundwater ingress concerns.	-	-	-
SOUTH KILLINGHOLME	2168	2321	2352	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Potential tide locking a concern.	Networks - Mixed strategies with main solution SuDS.	WRC - new permit and increase capacity.	-
SWALLOW	137	156	160	No	0	-	-	-	-	-
TATHWELL	42	43	46	No	0	-	-	-	-	-
TETNEY-NEWTON MARSH	53029	55216	55101	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Bathing water. Tidal inundation concern.	Wait and see.	Wait and see.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
ULCEBY	2308	2476	2511	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Permit at phosphate TAL.	Networks - Mixed strategies with main solution SuDS.	25% surface water removal.	-
WELTON-LE-WOLD	67	68	72	No	1	-	-	-	-	-

13.10 River Idle CaBA area

Background

The River Idle CaBA area covers only one of our water recycling catchments, which did progress through the DWMP beyond RBCS.

Given there is only one level 3 catchment within this level 2, the following section goes straight to the level 3 summary.

River Idle CaBA Level 3 details

Table 55

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns/ comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
ELKESLEY	288	335	335	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Investigate.	Wait and see	-

13.11 River Thame CaBA area

Background

The River Thame CaBA area covers only one of our water recycling catchments, which did not progress through the DWMP beyond RBCS.

13.12 River Torne CaBA area

Background

The River Torne CaBA area covers only one of our water recycling catchments, which did not progress through the DWMP beyond RBCS.

13.13 South Essex CaBA area

Background

The South Essex CaBA area covers 5 of our water recycling catchments, all of which progressed through the DWMP beyond RBCS.

South Essex CaBA RBCS

The table below summarises the number of South Essex CaBA level 3 catchments with triggers in each of the 19 RBCS measures.

Table 56

RBCS measure	Count of level 3 catchments triggering measure
Wastewater resilience metric catchment characterisation	1
Intermittent discharge impacts upon bathing or shellfish waters	1
Continuous or intermittent discharge impacts upon other sensitive receiving waters (part A)	0
Continuous or intermittent discharge impacts upon other sensitive receiving waters (part B)	0
Storm Overflow Assessment Framework (SOAF)	1
Common Assessment Framework (CAF)	2
Internal sewer flooding	0
External sewer flooding	0
Pollution incidents (category 1, 2 and 3)	1
WRC quality compliance	1
WRC DWF compliance	0
Storm overflows	0
Risks from interdependencies between Risk Management Authorities (RMA) systems	4
Planned residential new development	3
The Water Industry National Environment Programme (WINEP)	5
Sewer collapses	0
Sewer blockages	5

RBCS measure	Count of level 3 catchments triggering measure
WRC biological capacity	1
WRC descriptive permit	0

South Essex CaBA BRAVA

The BRAVA scores for all level 3 catchments within the South Essex CaBA area were aggregated to identify a level 2 BRAVA score. The outcome of this is shown in the table below.

As outlined in section5.5 Baseline Risk and Vulnerability Assessment (BRAVA), risk was assigned a score of 0 = low risk, 1 = medium risk or 2 = high risk.

Table 57

Planning Objective	2020	2050
Flooding in a storm (1 in 50)	0	0
External flooding	0	2
Internal flooding	1	2
Pollution incidents	2	2
Sewer collapses	2	-
DWF compliance	1	2
Quality compliance	0	0
Access to amenity areas	0	0
Green infrastructure	1	1

South Essex CaBA ODA

The following options have been identified as feasible solutions within the South Essex CaBA area.

Table 58

Group	Option
Customer side management	Water efficiency - domestic
	Water efficiency - commercial
Combined foul and sewer system	Proactive maintenance - rehabilitation
	Increased capacity - attenuation
	Reduce infiltration
Surface water management	SuDS - public
	Partnership funding
	SuDS - domestic
	SuDS - commercial
Wastewater treatment	Process optimisation
	Increased capacity - new streams
Other	Investigate
	Wait and see

South Essex CaBA programme appraisal

Within the South Essex catchment we have identified that across the 5 level 3 within the area they fall into the following breakdown:

- All progressed beyond RBCS.
- 0 present no, or low, risk at 2050.
- 2 where a 2050 strategy only is required.
- 3 where a medium term (by 2035) strategy is required.

The best value plan indicated that we would expect to spend around £151 million over the next 25 years, with around £60 million by 2035.

This assessment is based on current understanding of risk and forecast. We will continue to monitor all catchments, ensuring the strategies are still valid and adjusting our proposed implementation times as and when required.

South Essex CaBA Level 3 details

Table 59

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
BENFLEET	28432	28225	29366	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Flood risk priority catchment. Areas identified by the SWMP. Elevated river levels a future concern. Easthaven and Fobbin tidal barriers.	Wait and see.	25% infiltration reduction.	-
CANVEY ISLAND	38915	38638	40166	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Extensive partnership work ongoing. FCRM priority catchment. Areas identified in the SWMP.	Network - Mixed strategy with main solution of SuDS.	10% surface water removal.	-
PITSEA	24014	23610	23200	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Potential flood work. Flood risk priority catchments. Areas identified in the SWMP. Elevated river levels a future concern.	Networks - Mixed strategy with main solution of SuDS.	25% surface water removal.	Yes
TILBURY	152959	168004	180576	Yes	2	WRC compliance Environment and wellbeing	Potential flood work. Flood risk priority catchments.	Networks - Increase attenuation.	WRC - process optimisation. 10% surface water removal.	Yes
UPMINSTER	17735	17670	18221	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Areas identified in the SWMP.	Networks - Increase attenuation.	10% surface water removal.	-

13.14 Upper and Bedford Ouse CaBA area

Background

The Upper and Bedford Ouse CaBA area covers 154 of our water recycling catchments, 84 of which progressed through the DWMP beyond RBCS.

Upper and Bedford Ouse CaBA RBCS

The table below summarises the number of Upper and Bedford Ouse CaBA level 3 catchments with triggers in each of the 19 RBCS measures.

Table 60

RBCS measure	Count of level 3 catchments triggering measure
Wastewater resilience metric catchment characterisation	62
Intermittent discharge impacts upon bathing or shellfish waters	0
Continuous or intermittent discharge impacts upon other sensitive receiving waters (part A)	0
Continuous or intermittent discharge impacts upon other sensitive receiving waters (part B)	0
Storm Overflow Assessment Framework (SOAF)	5
Common Assessment Framework (CAF)	1
Internal sewer flooding	1
External sewer flooding	1
Pollution incidents (category 1, 2 and 3)	24
WRC quality compliance	5
WRC DWF compliance	4
Storm overflows	0
Risks from interdependencies between Risk Management Authorities (RMA) systems	11
Planned residential new development	13
The Water Industry National Environment Programme (WINEP)	72
Sewer collapses	20
Sewer blockages	29
WRC biological capacity	19

RBCS measure	Count of level 3 catchments triggering measure
WRC descriptive permit	0

Upper and Bedford Ouse CaBA BRAVA

The BRAVA scores for all level 3 catchments within the Upper and Bedford Ouse CaBA area were aggregated to identify a level 2 BRAVA score. The outcome of this is shown in the table below.

As outlined in section 5.5 Baseline Risk and Vulnerability Assessment (BRAVA), risk was assigned a score of 0 = low risk, 1 = medium risk or 2 = high risk.

Table 61

Planning Objective	2020	2050
Flooding in a storm (1 in 50)	0	0
External flooding	0	2
Internal flooding	0	2
Pollution incidents	1	2
Sewer collapses	1	-
DWF compliance	1	1
Quality compliance	1	1
Access to amenity areas	1	1
Green infrastructure	0	0

Upper and Bedford Ouse CaBA ODA

The following options have been identified as feasible solutions within the Upper and Bedford Ouse CaBA area.

Table 62

Group	Option
Customer side management	Water efficiency - domestic
	Water efficiency - commercial
	Customer education - domestic
	Greywater re-use - domestic
Combined foul and sewer system	Proactive maintenance - rehabilitation
	Increased capacity - attenuation
	Transfer between catchments
	Reduce infiltration
Surface water management	SuDS - public
	Partnership funding
	SuDS - domestic
	SuDS - commercial
Wastewater treatment	Improved maintenance
	Process optimisation
	Increased capacity - new streams
	New treatment works
	Effluent reuse - non potable
	Smart consenting
	Treat / pre-treat trade effluent
	Proactive maintenance - non-infra
Other	Investigate
	Wait and see

Upper and Bedford Ouse CaBA programme appraisal

Within the Upper and Bedford Ouse catchment we have identified that across the 154 level 3 within the area they fall into the following breakdown:

- 70 did not get assessed beyond RBCS
- 34 present no, or low, risk at 2050
- 13 where a 2050 strategy only is required
- 37 where a medium term (by 2035) strategy is required

The best value plan indicated that we would expect to spend around £476 million over the next 25 years, with around £201 million by 2035.

This assessment is based on current understanding of risk and forecast. We will continue to monitor all catchments, ensuring the strategies are still valid and adjusting our proposed implementation times as and when required.

Upper and Bedford Ouse CaBA Level 3 details

Table 63

L3 water recycling catchment	2021 population	2035 population	2050 populatio	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
ALCONBURY	3795	3644	3819	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Habitats. Permit close to phosphate TAL. Flood risk implications.	Networks - Mixed strategy with main solution of SuDS.	25% surface water removal	-
ARDLEY	442	441	472	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
ASHBROOK	3676	3646	3758	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution of SuDS.	25% surface water removal	-
ASHTON	5508	5914	6402	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Permit close to phosphate TAL.	Networks - Mixed strategy with main solution of SuDS.	25% surface water removal	-
ASTON ABBOTTS	423	416	456	No	0	-	-	-	-	-
ASTWOOD	126	123	127	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 populatio	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
BARTON LE CLAY	5570	6552	6890	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	-	WRC - transfer between catchments. 25% surface water reduction.	-
BEACHAMPTON	138	136	149	No	0	-	-	-	-	-
BEDFORD	187553	214064	223565	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Habitats.	WRC - new permit with increased capacity.	Wait and see.	-
BIGGLESWADE	21900	27562	28903	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution of SuDS.	50% surface water removal.	-
BLAKESLEY	1820	1867	2030	No	1	-	Surface water risk.	-	-	-
BLETSOE	1175	1183	1256	No	1	-	-	-	-	-
BOLNHURST	813	809	863	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
BRACKLEY (NEW)	46714	53240	54989	Yes	2	WRC compliance Environment and wellbeing	-	-	WRC - process optimisation.	-
BRAMPTON (CAMBS)	5673	5959	6215	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Habitats. Permit at phosphate TAL.	WRC - New permit with smart consenting. Networks - Mixed strategies with main solution of SuDS.	WRC - process optimisation. 25% surface water removal.	-

L3 water recycling catchment	2021 population	2035 population	2050 populatio	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
BUCKDEN	5288	5980	6202	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Habitats.	Networks - Mixed strategy with main solution of SuDS.	25% surface water removal	-
BUCKINGHAM	17767	22184	23694	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - New permit with increase capacity. Networks - Mixed strategies with main solution of SuDS.	25% surface water removal.	-
CALDECOTE	117	125	131	No	0	-	-	-	-	-
CASTLETHORPE	1116	1160	1195	Yes	0	WRC compliance Environment and wellbeing	-	WRC - Process optimisation.	Wait and see.	-
CATWORTH-HOSTEL	334	321	336	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
CHACKMORE	187	186	204	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategies with main solution of SuDS.	50% surface water removal.	-
CHALTON	11475	18832	18629	Yes	0	WRC compliance Environment and wellbeing	Permit at ammonia TAL. Catchment linked with Thames Water.	Investigate.	Wait and see.	-
CHAWSTON-TYTHE FARM	25	25	26	No	0	-	-	-	-	-
CHAWSTON-WYBOSTON	1075	1070	1134	No	0	-	-	-	-	-
CHELLINGTON	2653	2638	2816	No	1	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 populatio	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
CLIFTON	17694	18659	19811	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Habitats.	No risk identified.	WRC - increase in capacity.	-
CLOPHILL	7101	7761	8213	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Potential wetland opportunity. Wet woodland ongoing.	Networks - Mixed strategy with main solution of SuDS.	WRC - process optimisation. 50% surface water removal.	Yes
COTTON VALLEY	313130	350656	358228	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Habitats.	Networks - Mixed strategy with main solution of SuDS.	10% surface water removal.	-
COVINGTON	87	83	87	No	0	-	-	-	-	-
DEAN (LOWER)	313	312	333	No	0	-	-	-	-	-
DRAYTON PARSLOW	699	704	770	Yes	0	WRC compliance Environment and wellbeing	-	-	No risk identified.	-
DUCKSWORTH	9	9	10	No	0	-	-	-	-	-
DULOE	190	189	202	No	0	-	-	-	-	-
DUNSTABLE	55305	58026	61133	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	10% surface water removal.	-
DUNTON	660	726	768	No	0	-	Potential wetland opportunity.	-	-	-
EASTON (CAMBS)	1362	1306	1371	Yes	0	WRC compliance Environment and wellbeing	-	-	WRC - increase capacity and pro-active maintenance.	-

L3 water recycling catchment	2021 population	2035 population	2050 populatio	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
EVENLEY	632	651	708	Yes	0	WRC compliance Environment and wellbeing	-	Wait and see.	Wait and see.	-
EVERTON	486	568	598	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
FILGRAVE	125	122	126	No	0	-	-	-	-	-
FLITWICK	32422	35556	37548	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	-	Wait and see.	25% surface water removal.	-
FOXCOTE	5	5	6	No	0	-	-	-	-	-
FRINGFORD	409	409	437	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	WRC - increase capacity.	-
FRITWELL	546	581	618	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution of SuDS.	25% surface water removal.	-
GAMLINGAY	3701	4637	5257	No	0	-	Habitats.	-	-	-
GAYHURST	23	23	23	No	0	-	-	-	-	-
GREAT BARFORD	2290	2584	2726	No	1	-	-	-	-	-
GREAT BRICKHILL	762	749	820	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution of SuDS.	25% surface water removal.	-
GREAT GIDDING	295	283	297	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 populatio	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
GREAT HORWOOD	1270	1429	1534	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution of SuDS.	25% surface water removal.	-
GREAT LINFORD	44	43	44	No	0	-	-	-	-	-
GREENS NORTON	1770	1880	2038	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Infiltration reduction.	WRC - new permit and increase capacity. Potential wetland.	-
HAIL WESTON	665	638	670	No	0	-	-	-	-	-
HANSLOPE	2576	3882	3922	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - Increase capacity. Networks - mixed strategy with main solution of SuDS.	10% surface water removal.	-
HARDMEAD (NEW)	40	39	40	No	0	-	-	-	-	-
HARDWICK HETHE KLARGESTER	41	41	41	No	0	-	-	-	-	-
HARGRAVE	210	233	251	Yes	0	WRC compliance Environment and wellbeing	Highways drainage may be affected by climate change. Historic flooding.	No risk identified.	No risk identified.	-
HATLEY ST GEORGE	114	142	161	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
HAYNES	1138	1170	1246	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 populatio	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
HELMDON	2027	2087	2269	Yes	0	WRC compliance Environment and wellbeing	-	-	No risk identified.	-
HEMINGTON MAIN STREET	59	66	71	No	0	-	-	-	-	-
HETHE	227	227	243	No	0	-	-	-	-	-
HEXTON	96	95	99	No	0	-	-	-	-	-
HILLESDEN HAMLET	27	27	29	No	0	-	-	-	-	-
HILLESDEN-CHURCH END	81	80	87	No	0	-	-	-	-	-
HITCHIN	37069	37167	38324	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Habitats.	No risk identified.	25% surface water removal.	-
HOLWELL	333	330	341	No	0	-	-	-	-	-
HONEYDON	32	32	34	No	0	-	-	-	-	-
HORTON	95	389	386	No	0	-	-	-	-	-
HUNTINGDON (GODMANCHESTER)	44007	44395	46252	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Habitats. Flood risk implications. Areas identified in SWMP. Embankment scheme identified. Slow the flow opportunities.	Networks - mixed strategy with main solution of SuDS.	25% surface water removal.	Yes
IVINGHOE	4170	4417	4799	Yes	0	WRC compliance Environment and wellbeing	Permit close to phosphate TAL.	No risk identified.	No risk identified.	-

L3 water recycling catchment	2021 population	2035 population	2050 populatio	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
IVINGHOE ASTON	201	198	216	No	0	-	-	-	-	-
KEMPSTON HARDWICK	30	29	31	No	0	-	-	-	-	-
KIMBOLTON	4074	4128	4316	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Habitats.	Networks - Mixed strategy with main solution of SuDS.	25% surface water removal.	-
LAVENDON	1472	1661	1702	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution of SuDS.	25% surface water removal.	-
LECKHAMPSTEAD	57	56	61	No	0	-	-	-	-	-
LEDBURN	133	131	143	No	0	-	-	-	-	-
LEIGHTON BROMSWOLD	163	156	164	No	0	-	-	-	-	-
LEIGHTON LINSLADE	43859	47277	50134	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution of SuDS.	25% surface water removal.	-
LETCHWORTH	46846	50353	51693	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Increased attenuation.	25% surface water removal.	-
LITTLE BARFORD	40	40	43	No	0	-	-	-	-	-
LITTLE STAUGHTON	672	669	704	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Wait and see.	Wait and see.	-
MARSTON MORETAINE	10690	17768	18493	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - New permit with increase capacity.	Wait and see.	-

L3 water recycling catchment	2021 population	2035 population	2050 populatio	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
MELCHBOURNE	227	226	241	No	1	-	-	-	-	-
MENTMORE	199	196	215	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
MIDDLE CLAYDON	15	14	16	No	0	-	-	-	-	-
MILLBROOK	152	148	156	No	0	-	-	-	-	-
MILTON BRYAN	172	167	179	No	0	-	-	-	-	-
MOLESWORTH	207	198	208	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
NEEDINGWORTH	2372	2274	2387	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Habitats. Flood risk implications.	Networks - Mixed strategy with main solution of SuDS.	25% surface water removal.	-
NEWNHAM (HERTS)	72	71	73	No	0	-	-	-	-	-
NEWPORT PAGNELL	166	1468	1427	No	1	-	-	-	-	-
NEWSPRING WTW	46	45	47	No	0	-	-	-	-	-
NEWTON BLOSSOMVILLE	358	349	361	No	0	-	-	-	-	-
NEWTON BROMSWOLD	17	20	21	No	0	-	-	-	-	-
NORTH CRAWLEY	794	773	799	No	0	-	-	-	-	-
NORTH MARSTON	721	709	777	Yes	0	WRC compliance Environment and wellbeing	-	-	No risk identified.	-
ODELL	4093	4070	4343	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution of SuDS.	Infiltration removal 25% surface water removal.	-

L3 water recycling catchment	2021 population	2035 population	2050 populatio	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
OLD WESTON	199	191	201	No	1	-	-	-	-	-
OLNEY	8081	8558	8799	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	-	25% surface water removal.	-
OVING	428	622	656	Yes	0	WRC compliance Environment and wellbeing	-	WRC - Increase capacity.	Wait and see.	-
PADBURY	1313	1341	1464	Yes	1	WRC compliance Environment and wellbeing	-	Wait and see.	Wait and see.	-
PAPWORTH EVERARD	4646	5805	6573	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Habitats.	Wait and see.	Wait and see.	-
PAXTON	1425	1367	1435	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	Wait and see.	-
PERTENHALL	277	275	294	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
POPPYHILL	21123	25369	26802	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution of SuDS.	WRC - new permit and increase capacity. Or transfer between catchments.	-
POTTERSPURY LODGE	78	79	86	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 populatio	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
POTTON	8262	8502	8912	Yes	0	WRC compliance Environment and wellbeing	Habitats.	No risk identified.	Wait and see.	-
POUNDON	95	342	342	No	0	-	-	-	-	-
PRESTON BISSETT	254	250	274	No	0	-	-	-	-	-
PULLOXHILL	45	44	46	No	0	-	-	-	-	-
RADSTONE	36	37	40	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
RAVENSTONE-STK GOLDINGTON	796	775	802	No	0	-	-	-	-	-
RISELEY	1463	1455	1553	Yes	1	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
ROXTON	450	566	584	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Wait and see.	Wait and see.	-
SANDON (NEW)	306	304	313	Yes	0	WRC compliance Environment and wellbeing	-	Wait and see.	Wait and see.	-
SANDY	13168	12850	13744	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - Transfer between catchments. Networks - Mixed strategy with main solution of SuDS.	WRC - transfer between catchments or increase in capacity. 10% surface water removal.	-
SHELTON	61	61	65	No	1	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 populatio	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
SHERINGTON	1114	1089	1126	Yes	0	WRC compliance Environment and wellbeing	-	-	Wait and see.	-
SHILLINGTON	7021	8721	9130	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - Increase capacity. Networks - Mixed strategy with main solution of SuDS.	50% surface water removal.	-
SILVERSTONE	3250	4104	4364	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Permit close to phosphate TAL.	Networks - Mixed strategy with main solution of SuDS.	50% surface water removal.	-
SOULDROP	199	198	211	No	0	-	-	-	-	-
ST IVES	17466	17387	18189	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Habitats. Historic flooding.	Networks - Mixed strategy with main solution of SuDS.	10% surface water removal.	-
ST NEOTS	39924	45379	47698	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Habitats.	WRC - New permit with increase capacity. Networks - Mixed strategies with main solution of SuDS.	50% surface water removal.	-
STAGSDEN	521	519	542	No	1	-	Potential wetland opportunity.	-	-	-
STANBRIDGEFORD	10254	10677	11343	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Permit at ammonia TAL.	Infiltration reduction.	25% surface water removal.	-

L3 water recycling catchment	2021 population	2035 population	2050 populatio	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
STEEPLE CLAYDON	3674	4415	4736	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution of SuDS.	25% surface water removal.	-
STOKE BRUERNE	753	786	853	Yes	0	WRC compliance Environment and wellbeing	-	-	No risk identified.	-
STOKE LYNE	73	73	79	No	0	-	-	-	-	-
STOWE	796	782	858	No	0	-	-	-	-	-
SWANBOURNE	989	992	1084	Yes	0	WRC compliance Environment and wellbeing	-	-	No risk identified.	-
SWINESHEAD (BEDS)	159	158	168	No	0	-	-	-	-	-
SYRESHAM	2602	2618	2694	No	0	-	Flood risk identified.	-	-	-
TEMPSFORD	2274	2290	2440	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Habitats.	Networks - Mixed strategy with main solution of SuDS.	25% surface water removal.	-
THURLEIGH	591	588	627	Yes	1	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
TIFFIELD	414	421	459	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
TILBROOK	176	168	177	No	0	-	-	-	-	-
TOWCESTER	12337	18614	19527	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Permit close to phosphate TAL.	No risk identified.	Wait and see.	-

L3 water recycling catchment	2021 population	2035 population	2050 populatio	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
TURVEY-COTTAGE/N BLOVIL R	1258	1251	1334	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	Wait and see.	-
TWYFORD	647	636	697	No	0	-	-	-	-	-
UPPER SUNDON	534	518	555	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Wait and see.	WRC - new permit with increased capacity.	-
UTTONS DROVE	22387	27971	31668	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Concerns on water quality. Flood risk implications.	WRC - Process optimisation. Networks - Mixed strategy with main solution of SuDS.	25% surface water removal.	-
WAPPENHAM	1382	1447	1571	Yes	0	WRC compliance Environment and wellbeing	-	Wait and see.	Wait and see.	-
WARESLEY	1834	1883	1967	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution of SuDS.	50% surface water removal.	-
WATER STRATFORD	103	101	111	No	0	-	-	-	-	-
WAVENDON-LOWER END	78	280	276	No	0	-	-	-	-	-
WESTBURY	715	724	773	Yes	1	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
WESTON UNDERWOOD	220	214	222	No	0	-	-	-	-	-
WHADDON	914	914	1000	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Permit close to phosphate TAL.	No risk identified.	Wait and see.	-

L3 water recycling catchment	2021 population	2035 population	2050 populatio	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
WHITFIELD	216	231	249	No	0	-	-	-	-	-
WILDEN	379	376	402	No	0	-	-	-	-	-
WING-CUBLINGTON ROAD	3486	3438	3768	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution of SuDS.	Network - increased conveyance.	-
WINSLOW	6629	7927	8504	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution of SuDS.	25% surface water removal.	-
WYTON (RAF)	1791	1721	1802	Yes	0	WRC compliance Environment and wellbeing	Habitats. Historic flooding.	No risk identified.	No risk identified.	-
YIELDEN	152	151	161	No	0	-	-	-	-	-

13.15 Water Care CaBA area

Background

The Water Care CaBA area covers 25 of our water recycling catchments, 19 of which progressed through the DWMP beyond RBCS.

Water Care CaBA RBCS

The table below summarises the number of Water Care CaBA level 3 catchments with triggers in each of the 19 RBCS measures.

Table 64

RBCS measure	Count of level 3 catchments triggering measure
Wastewater resilience metric catchment characterisation	7
Intermittent discharge impacts upon bathing or shellfish waters	0
Continuous or intermittent discharge impacts upon other sensitive receiving waters (part A)	0
Continuous or intermittent discharge impacts upon other sensitive receiving waters (part B)	0
Storm Overflow Assessment Framework (SOAF)	0
Common Assessment Framework (CAF)	4
Internal sewer flooding	1
External sewer flooding	4
Pollution incidents (category 1, 2 and 3)	4
WRC quality compliance	0
WRC DWF compliance	2
Storm overflows	0
Risks from interdependencies between Risk Management Authorities (RMA) systems	2
Planned residential new development	3
The Water Industry National Environment Programme (WINEP)	16
Sewer collapses	2
Sewer blockages	3

RBCS measure	Count of level 3 catchments triggering measure
WRC biological capacity	3
WRC descriptive permit	0

Water Care CaBA BRAVA

The BRAVA scores for all level 3 catchments within the Water Care CaBA area were aggregated to identify a level 2 BRAVA score. The outcome of this is shown in the table below.

As outlined in section 5.5 Baseline Risk and Vulnerability Assessment (BRAVA), risk was assigned a score of 0 = low risk, 1 = medium risk or 2 = high risk.

Table 65

Planning Objective	2020	2050
Flooding in a storm (1 in 50)	0	0
External flooding	0	2
Internal flooding	0	1
Pollution incidents	0	2
Sewer collapses	1	-
DWF compliance	1	1
Quality compliance	1	1
Access to amenity areas	1	1
Green infrastructure	0	0

Water Care CaBA ODA

The following options have been identified as feasible solutions within the Water Care CaBA area.

Table 66

Group	Option
Customer side management	Water efficiency - domestic
	Water efficiency - commercial
	Customer education - domestic
	Customer education - commercial
Combined foul and sewer system	Proactive maintenance - rehabilitation
	Increased capacity - attenuation
	Transfer between catchments
	Reduce infiltration
Surface water management	SuDS - public
	Partnership funding
	SuDS - domestic
	SuDS - commercial
Wastewater treatment	Process optimisation
	Increased capacity - new streams
	Increased capability - new process
	Smart consenting
	Catchment management - quality
	Treat / pre-treat trade effluent
Other	Investigate
	Wait and see

Water Care CaBA programme appraisal

Within the Water Care catchment we have identified that across the 35 level 3 within the area they fall into the following breakdown:

- 6 did not get assessed beyond RBCS
- 7 present no, or low, risk at 2050
- 2 where a 2050 strategy only is required
- 10 where a medium term (by 2035) strategy is required

The best value plan indicated that we would expect to spend around £112 million over the next 25 years, with around £46 million by 2035.

This assessment is based on current understanding of risk and forecast. We will continue to monitor all catchments, ensuring the strategies are still valid and adjusting our proposed implementation times as and when required.

Water Care CaBA Level 3 details

Table 67

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
BENWICK	951	1077	1147	Yes	1	WRC compliance Environment and wellbeing	Flood risk implications.	No risk identified.	No risk identified.	-
CHATTERIS-NIGHTLAYER FEN	11235	12687	13506	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	Wait and see.	-
CHRISTCHURCH-FEN VIEW	346	392	418	No	0	-	Flood risk implications.	-	-	-
COVENEY	283	330	342	No	0	-	-	-	-	-
DODDINGTON	3965	4484	4776	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Flood risk implications.	WRC - New permit with increased capacity. Network - Mixed strategies with main solution of SuDS.	25% surface water removal.	-
HOLME	583	616	642	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Flood risk implications.	No risk identified.	Wait and see.	-
KINGS RIPTON	200	192	202	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
LITTLEPORT	8078	9386	9708	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Historic highway flooding.	Network - Mixed strategies with main solution of SuDS.	25% surface water removal.	-
LITTLEPORT PLAINS LANE	144	152	154	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Wait and see.	WRC - transfer between catchments.	-
MANEA-TOWN LOTS	1720	1947	2075	Yes	0	WRC compliance Environment and wellbeing	Flood risk implications.	Infiltration reduction.	No risk identified.	-
MARCH	21662	24461	26041	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Identified in FRMP. Flood action group. Embankment scheme identified. Future Fens Strategy.	Network - Mixed strategies with main solution of SuDS.	25% surface water removal.	Yes
MEPAL	1081	1263	1307	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - Increased capacity.	Wait and see.	-
NORDELPH	68	67	68	No	0	-	Flood risk implications.	-	-	-
OLDHURST	5105	4900	5139	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Flood risk implications. River can see low flows and also have flash floods.	No risk identified.	Wait and see.	-
OUTWELL	60	58	61	No	1	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
RAMSEY	10233	12118	12602	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Flood risk implications.	Network - Mixed strategies with main solution of SuDS.	25% surface water removal.	-
SAWTRY	6548	6917	7211	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Flood risk implications.	Network - Mixed strategies with main solution of SuDS.	25% surface water removal.	-
SAWTRY	7754	7496	7863	Yes	1	WRC compliance Environment and wellbeing	River can have low flows.	Infiltration reduction.	Wait and see.	-
TIPPS END	236	360	374	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Flood risk implications.	No risk identified.	Wait and see.	-
UPWELL	30	29	30	No	0	-	Flood risk implications.	-	-	-
UPWOOD	384	369	387	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Flood risk implications.	No risk identified.	Wait and see.	-
WHITTLESEY	15967	18065	19248	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Flood risk implications.	Network - Attenuation.	10% surface water removal.	-
WILBURTON	1102	1281	1325	Yes	0	WRC compliance Environment and wellbeing	-	-	WRC - increase capacity.	-
WITCHAM	4641	5398	5585	Yes	0	WRC compliance Environment and wellbeing	-	Infiltration reduction.	Wait and see.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
WITCHFORD	2120	2475	2563	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	Wait and see.	-

13.16 Welland Valley CaBA area

Background

The Welland Valley CaBA area covers 80 of our water recycling catchments, 40 of which progressed through the DWMP beyond RBCS.

Welland Valley CaBA RBCS

The table below summarises the number of Welland Valley CaBA level 3 catchments with triggers in each of the 19 RBCS measures.

Table 68

RBCS measure	Count of level 3 catchments triggering measure
Wastewater resilience metric catchment characterisation	30
Intermittent discharge impacts upon bathing or shellfish waters	0
Continuous or intermittent discharge impacts upon other sensitive receiving waters (part A)	0
Continuous or intermittent discharge impacts upon other sensitive receiving waters (part B)	0
Storm Overflow Assessment Framework (SOAF)	3
Common Assessment Framework (CAF)	0
Internal sewer flooding	0
External sewer flooding	1
Pollution incidents (category 1, 2 and 3)	10
WRC quality compliance	2
WRC DWF compliance	1
Storm overflows	0
Risks from interdependencies between Risk Management Authorities (RMA) systems	2
Planned residential new development	3
The Water Industry National Environment Programme (WINEP)	33
Sewer collapses	10
Sewer blockages	7

RBCS measure	Count of level 3 catchments triggering measure
WRC biological capacity	2
WRC descriptive permit	1

Welland Valley CaBA BRAVA

The BRAVA scores for all level 3 catchments within the Welland Valley CaBA area were aggregated to identify a level 2 BRAVA score. The outcome of this is shown in the table below.

As outlined in section5.5 Baseline Risk and Vulnerability Assessment (BRAVA) risk was assigned a score of 0 = low risk, 1 = medium risk or 2 = high risk.

Table 69

Planning Objective	2020	2050
Flooding in a storm (1 in 50)	0	0
External flooding	0	2
Internal flooding	0	1
Pollution incidents	0	2
Sewer collapses	1	-
DWF compliance	1	1
Quality compliance	1	1
Access to amenity areas	1	1
Green infrastructure	0	0

Welland Valley CaBA ODA

The following options have been identified as feasible solutions within the Welland Valley CaBA area.

Table 70

Group	Option
Customer side management	Water efficiency - domestic
	Water efficiency - commercial
	Customer education - domestic
	Customer education - commercial
Combined foul and sewer system	Proactive maintenance - rehabilitation
	Increased capacity - attenuation
	Transfer between catchments
	Reduce infiltration
Surface water management	SuDS - public
	Partnership funding
	SuDS - domestic
	SuDS - commercial
Wastewater treatment	Improved maintenance
	Increased capacity - new streams
	Effluent reuse - non potable
	Smart consenting
	Treat / pre-treat trade effluent
	Proactive maintenance - non-infra
Other	Investigate
	Wait and see

Welland Valley CaBA programme appraisal

Within the Welland Valley catchment we have identified that across the 80 level 3 within the area they fall into the following breakdown:

- 40 did not get assessed beyond RBCS
- 16 present no, or low, risk at 2050
- 6 where a 2050 strategy only is required
- 18 where a medium term (by 2035) strategy is required

The best value plan indicated that we would expect to spend around £99 million over the next 25 years, with around £45 million by 2035.

This assessment is based on current understanding of risk and forecast. We will continue to monitor all catchments, ensuring the strategies are still valid and adjusting our proposed implementation times as and when required.

Welland Valley CaBA Level 3 details

Table 71

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
AYSTON	64	62	66	No	0	-	-	-	-	-
BAINTON	1723	1674	1759	No	1	-	-	-	-	-
BARROWDEN	430	419	442	No	1	-	-	-	-	-
BELTON	241	235	247	No	0	-	-	-	-	-
BOOTHBY PAGNELL	110	105	109	No	0	-	-	-	-	-
BRAUNSTON	349	339	357	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - New permit. Networks - Mixed strategy with main solution of SuDS.	25% surface water removal.	-
BRAYBROOKE	379	448	485	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Wait and see.	Wait and see.	-
BURTON COGGLES	99	95	99	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	Wait and see.	-
COLLYWESTON	653	728	787	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
CORBY GLEN	966	1588	1599	No	1	-	-	-	-	-
COTTESMORE	4230	4125	4347	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution of SuDS.	25% surface water removal.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
CRANOE	22	22	25	No	0	-	-	-	-	-
DEEPING	19218	20632	21622	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - Increased capacity.	Customer education.	-
DEEPING ST NICH - WREN CL	61	63	64	No	0	-	-	-	-	-
DEEPING ST NICHOLAS	484	628	640	Yes	0	WRC compliance Environment and wellbeing	-	-	No risk identified.	-
DINGLEY	15	17	17	No	0	-	-	-	-	-
EAST LANGTON	364	371	415	Yes	0	WRC compliance Environment and wellbeing	-	-	No risk identified.	-
EASTON ON THE HILL	1207	1348	1459	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
EDENHAM	255	245	254	Yes	0	WRC compliance Environment and wellbeing	-	WRC - Increased capacity.	No risk identified.	-
EMPINGHAM	2137	2089	2191	No	1	-	-	-	-	-
ETTON	26	25	26	No	0	-	-	-	-	-
FOSDYKE WHITECROSS GATE	294	320	333	Yes	0	WRC compliance Environment and wellbeing	Shellfish water.	-	WRC - inreased capacity. Potential wetland.	-
FOXTON (LEICS)	1013	1032	1157	Yes	0	WRC compliance Environment and wellbeing	Future flood risk.	Wait and see.	Wait and see.	-
GLOOSTON	58	59	66	No	0	-	-	-	-	-
GOADBY	40	41	46	No	0	-	-	-	-	-
GOSBERTON	2739	3921	3982	Yes	1	WRC compliance Environment and wellbeing	-	WRC - Increase capacity.	Wait and see.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
GREAT CASTERTON	420	422	444	Yes	0	WRC compliance Environment and wellbeing	-	Wait and see.	Wait and see.	-
GREAT EASTON (LEICS)	1128	1218	1353	Yes	0	WRC compliance Environment and wellbeing	-	-	Infiltration reduction.	-
GRETTON	1484	1579	1789	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution of SuDS.	Customer education. 25% surface water removal.	-
GUMLEY	76	77	86	No	0	-	-	-	-	-
HALLATON	663	675	756	Yes	0	WRC compliance Environment and wellbeing	-	Infiltration reduction.	Wait and see.	-
HARRINGWORTH	197	220	238	No	0	-	-	-	-	-
HOLBEACH	9798	14764	15849	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Permit at phosphate TAL.	-	Customer education. Water efficiency. 25% surface water removal.	-
HORNINGHOLD	49	50	56	No	0	-	Climate change and elevated river levels could impact surface water flooding.	-	-	-
HUSBANDS BOSWORTH	942	1015	1129	No	0	-	-	-	-	-
INGOLDSBY	284	273	283	No	0	-	-	-	-	-
IRNHAM	62	60	62	No	0	-	-	-	-	-
KETTON	2180	2414	2517	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution of SuDS.	25% surface water removal.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
KIBWORTH	5504	5607	6286	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Surface water drainage and water quality a concern.	WRC - Increase capacity.	Wait and see.	-
KNOSSINGTON	361	347	363	Yes	0	WRC compliance Environment and wellbeing	-	-	No risk identified.	-
LITTLE BYTHAM	1684	1859	1910	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Permit close to phosphate TAL. Potential groundwater ingress.	Networks - Mixed strategy with main solution of increased sewer capacity.	25% surface water removal.	-
LITTLE CASTERTON	254	250	262	No	0	-	-	-	-	-
LYDDINGTON	366	361	380	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution of SuDS.	Customer education. Water efficiency. 25% surface water removal.	-
MANTHORPE	657	632	655	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	Wait and see.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
MARKET HARBOROUGH	25151	28251	31229	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Climate change could impact surface water flooding. Permit at phosphate TAL. Potentially suitable for wetland. Welland Action Plan being updated. Slow the Flow project proposed. Surface water management plan progressing.	WRC - Increased Capacity Networks - Attenuation.	10% surface water removal.	Yes
MARSTON TRUSSELL	146	155	173	No	0	-	-	-	-	-
MEDBOURNE	443	633	678	No	1	-	-	WRC - Process optimisation.	-	-
MIDDLETON (NORTHANTS)	1502	1531	1743	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution of SuDS.	25% surface water removal.	-
MORCOTT	297	294	309	No	0	-	-	-	-	-
MOWSLEY	239	243	272	No	0	-	-	-	-	-
NORTH LUFFENHAM	1064	1052	1108	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution of SuDS.	25% surface water removal.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
OAKHAM	11807	11491	12111	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Rutland water.	Network - Mixed strategy with main solution of SuDS.	25% surface water removal.	-
OLD SOMERBY	238	228	237	No	1	-	-	-	-	-
PETERBOROUGH-HURN RD	91	90	94	No	0	-	-	-	-	-
PICKWORTH (RUTLAND)	13	12	13	No	0	-	-	-	-	-
PRESTON	158	154	162	No	0	-	-	-	-	-
RIDLINGTON (LEICS)	223	217	228	No	0	-	-	-	-	-
ROCKINGHAM	264	269	307	No	2	-	-	-	-	-
ROPSLEY	782	751	779	No	0	-	-	-	-	-
RYHALL	2565	2602	2735	Yes	0	WRC compliance Environment and wellbeing	-	-	Wait and see.	-
SADDINGTON	228	233	261	No	0	-	-	-	-	-
SEATON	121	118	125	No	0	-	-	-	-	-
SHANGTON	79	80	90	No	0	-	-	-	-	-
SIBBERTOFT	421	447	501	Yes	0	WRC compliance Environment and wellbeing	Permit at phosphate TAL.	No risk identified.	No risk identified.	-
SKEFFINGTON	150	153	171	No	0	-	-	-	-	-
SPALDING	80872	91820	94364	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Shellfish water. Historic flooding.	WRC - Increase capacity.	Wait and see.	-
STAMFORD	23586	26292	28290	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Network - Increased capacity	25% surface water removal.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
STOKE ALBANY	1034	1221	1323	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Wait and see.	Wait and see.	-
SURFLEET	1060	1328	1359	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - New permit.	Wait and see.	-
SUTTERTON-WIGTOFT	2259	2901	2964	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	WRC - New permit.	Wait and see.	-
THEDDINGWORTH	177	180	202	No	0	-	-	-	-	-
THORPE LANGTON	174	182	203	No	0	-	-	-	-	-
TICKENCOTE	46	45	47	No	0	-	-	-	-	-
TILTON ON THE HILL	331	337	378	Yes	1	WRC compliance Environment and wellbeing	-	WRC - Increase capacity.	Infiltration reduction.	-
TUGBY	232	237	265	Yes	0	WRC compliance Environment and wellbeing	-	-	No risk identified.	-
UPPINGHAM	4899	4875	5124	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution of SuDS.	25% surface water removal.	-
WELHAM	14	14	16	No	0	-	-	-	-	-
WESTON BY WELLAND	504	595	645	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Wait and see.	Wait and see.	-
WING	353	351	364	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	Wait and see.	-
WING HOLLOW	118	118	119	No	0	-	-	-	-	-

13.17 Witham CaBA area

Background

The Witham CaBA area covers 127 of our water recycling catchments, 61 of which progressed through the DWMP beyond RBCS.

Witham CaBA RBCS

The table below summarises the number of Witham CaBA level 3 catchments with triggers in each of the 19 RBCS measures.

Table 72

RBCS measure	Count of level 3 catchments triggering measure
Wastewater resilience metric catchment characterisation	48
Intermittent discharge impacts upon bathing or shellfish waters	3
Continuous or intermittent discharge impacts upon other sensitive receiving waters (part A)	0
Continuous or intermittent discharge impacts upon other sensitive receiving waters (part B)	0
Storm Overflow Assessment Framework (SOAF)	5
Common Assessment Framework (CAF)	1
Internal sewer flooding	4
External sewer flooding	3
Pollution incidents (category 1, 2 and 3)	9
WRC quality compliance	1
WRC DWF compliance	9
Storm overflows	4
Risks from interdependencies between Risk Management Authorities (RMA) systems	4
Planned residential new development	4
The Water Industry National Environment Programme (WINEP)	50
Sewer collapses	21
Sewer blockages	13

RBCS measure	Count of level 3 catchments triggering measure
WRC biological capacity	14
WRC descriptive permit	0

Witham CaBA BRAVA

The BRAVA scores for all level 3 catchments within the Witham CaBA area were aggregated to identify a level 2 BRAVA score. The outcome of this is shown in the table below.

As outlined in section5.5 Baseline Risk and Vulnerability Assessment (BRAVA), risk was assigned a score of 0 = low risk, 1 = medium risk or 2 = high risk.

Table 73

Planning Objective	2020	2050
Flooding in a storm (1 in 50)	0	0
External flooding	0	1
Internal flooding	0	1
Pollution incidents	0	1
Sewer collapses	1	-
DWF compliance	1	1
Quality compliance	1	1
Access to amenity areas	1	1
Green infrastructure	0	0

Witham CaBA ODA

The following options have been identified as feasible solutions within the Witham CaBA area.

Table 74

Group	Option
Customer side management	Water efficiency - domestic
	Water efficiency - commercial
	Customer education - domestic
	Customer education - commercial
	Greywater re-use - domestic
	Greywater re-use - commercial
Combined foul and sewer system	Proactive maintenance - rehabilitation
	Increased capacity - attenuation
	Transfer between catchments
	Reduce infiltration
Surface water management	SuDS - public
	Partnership funding
	SuDS - domestic
	SuDS - commercial
Wastewater treatment	Process optimisation
	Increased capacity - new streams
	Increased capability - new process
	Smart consenting
	Wetlands
	Treat / pre-treat trade effluent
Other	Investigate
	Wait and see

Witham CaBA Programme appraisal

Within the Witham catchment we have identified that across the 127 level 3 within the area they fall into the following breakdown:

- 66 did not get assessed beyond RBCS
- 26 present no, or low, risk at 2050
- 11 where a 2050 strategy only is required
- 24 where a medium term (by 2035) strategy is required

The best value plan indicated that we would expect to spend around £266 million over the next 25 years, with around £125 million by 2035.

This assessment is based on current understanding of risk and forecast. We will continue to monitor all catchments, ensuring the strategies are still valid and adjusting our proposed implementation times as and when required.

Witham CaBA Level 3 details

Table 75

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
AISTHORPE	361	411	422	No	0	-	-	WRC - Transfer between catchments.	-	-
ALFORD	3946	4084	4373	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Permit at phosphate TAL.	Networks - Mixed strategy with main solution of SuDS.	25% surface water removal.	-
ALLINGTON	866	836	867	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
AMBER HILL	64	62	65	No	0	-	-	-	-	-
ANCASTER	1449	1692	1733	Yes	0	WRC compliance Environment and wellbeing	-	WRC - New permit with increased capacity.	Wait and see.	-
ANDERBY-SEA ROAD	612	614	630	No	0	-	Potential wetland option.	-	-	-
ANWICK	34372	35398	35746	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution of SuDS.	WRC - new permit with increased capacity. 25% surface water removal.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
ASHBY DE LA LAUNDE	160	186	195	No	0	-	-	-	-	-
AUNSBY VILLAGE	59	68	72	No	0	-	-	-	-	-
BARDNEY	2060	2349	2407	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
BARNBY IN THE WILLOWS	144	168	177	No	0	-	-	-	-	-
BASSINGHAM	2320	2686	2811	Yes	0	WRC compliance Environment and wellbeing	Climate change will impact frequecy of high flows.	Wait and see.	Wait and see.	-
BECKINGHAM	225	262	275	No	0	-	-	-	-	-
BILLINGHAY	2760	3209	3361	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Climate change will impact frequecy of high flows.	Networks - Mixed strategy with main solution of SuDS.	WRC - process optimisation. Infiltration removal. 50% surface water reduction.	-
BOSTON	55020	59966	62549	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Shellfish waters.	Wait and see.	Water efficiency. 10% surface water removal.	-
BOURNE	28998	31552	32115	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	Customer education and water efficiency.	-
BRANSTON BOOTHS	294	336	350	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
BRANT BROUGHTON	702	816	854	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Climate change will impact frequecy of high flows.	WRC - Transfer between catchments.	Reduce infiltration. 50% surface water removal.	-
BUCKNALL	478	481	516	No	0	-	-	-	-	-
CANDLESBY	46	46	50	No	0	-	-	-	-	-
CANWICK	128022	130089	130723	Yes	2	WRC compliance Environment and wellbeing	-	-	No risk identified.	-
CARLTON SCROOP	34	33	34	No	0	-	-	-	-	-
CAYTHORPE	1196	1149	1191	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution of SuDS.	25% surface water removal.	-
CHAPEL HILL	159	182	190	No	0	-	-	-	-	-
CLAYPOLE	1185	2730	2716	Yes	0	WRC compliance Environment and wellbeing	-	WRC - New permit with increased capacity.	Wait and see.	-
COLSTERWORTH	1840	2037	2092	Yes	1	WRC compliance Environment and wellbeing	-	Wait and see.	Wait and see.	-
CONINGSBY	7282	7938	8396	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Wait and see.	Wait and see.	-
CORRINGHAM	415	473	484	No	1	-	-	-	-	-
CRANWELL	3622	4213	4413	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
CROFT	253	254	259	No	0	-	-	-	-	-
DONINGTON	2898	3880	3954	Yes	1	WRC compliance Environment and wellbeing	-	-	WRC - new permit with increased capacity.	-
DONINGTON ON BAIN	308	310	332	No	0	-	-	-	-	-
DORRINGTON	345	401	420	Yes	0	WRC compliance Environment and wellbeing	-	WRC - New permit.	Wait and see.	-
DUNHOLME	6063	6911	7082	Yes	1	WRC compliance Environment and wellbeing	Permit at phosphate TAL.	-	No risk identified.	-
DUNSBY	1547	1486	1541	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Permit at TAL.	No risk identified.	Wait and see.	-
EAST KIRKBY	894	899	966	No	0	-	-	-	-	-
FALDINGWORTH	325	371	380	No	1	-	Potential wetland option.	-	-	-
FENTON PUMP LANE	198	191	198	No	0	-	-	-	-	-
FISHTOFT	9388	11094	11457	Yes	1	WRC compliance Environment and wellbeing	Shellfish waters.	Wait and see.	Wait and see.	-
FISKERTON	1293	1450	1481	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution of SuDS.	50% surface water reduction.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
FRAMPTON	10092	11311	11713	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Shellfish waters. Flood risk priority catchment.	WRC - Increase process capacity.	Wait and see.	-
FRISKNEY	837	843	904	No	0	-	-	-	-	-
FRITHVILLE	117	118	127	No	1	-	-	-	-	-
FULBECK	478	459	476	Yes	0	WRC compliance Environment and wellbeing	Permit close to phosphate TAL.	No risk identified.	No risk identified.	-
GIPSEY BRIDGE	499	513	550	No	0	-	-	-	-	-
GLENTWORTH	540	614	629	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
GREAT PONTON	376	362	375	No	0	-	Potential wetland option.	-	-	-
HARBY	355	413	438	No	0	-	-	-	-	-
HARLAXTON	1161	1115	1157	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution of SuDS.	10% surface water removal.	-
HECKINGTON	4185	4859	5088	Yes	1	WRC compliance Environment and wellbeing	-	WRC - Increase process capacity.	WRC - new permit with increased capacity.	-
HELPRINGHAM	1015	1181	1237	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	Wait and see.	-
HEMINGBY-MAIN RD	310	311	321	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
HOLTON CUM BECKERING	114	130	133	No	0	-	-	-	-	-
HORBLING	3099	3093	3198	No	1	-	Permit close to phosphate TAL.	-	-	-
HORNCASTLE	7863	8764	9274	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	Permit at phosphate TAL. Undergoing surface water flood modelling. Identified potential areas for habitat creation.	Networks - Mixed strategy with main solution of SuDS.	50% surface water reduction.	-
HOUGH ON THE HILL	133	128	133	No	0	-	-	-	-	-
INGHAM	844	962	986	No	0	-	-	-	-	-
INGOLDMELLS	45387	47001	49148	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Bathing water.	-	Sewer maintenance.	-
KIRKBY LA THORPE	1359	1581	1656	No	0	-	-	WRC - Increased capacity.	-	-
LEADENHAM	1145	1331	1394	Yes	0	WRC compliance Environment and wellbeing	Permit at phosphate TAL.	Wait and see.	Wait and see.	-
LEASINGHAM	1649	1919	2010	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
LEGBOURNE	745	801	855	Yes	0	WRC compliance Environment and wellbeing	-	WRC - Increased capacity.	Wait and see.	-
LITTLE PONTON	58	56	58	No	0	-	-	-	-	-
LONDONTHORPE	937	900	934	No	0	-	FDGiA scheme underway.	WRC - Transfer between catchments.	-	-
LONG BENNINGTON	2627	2859	2941	Yes	1	WRC compliance Environment and wellbeing	FDGiA scheme underway.	No risk identified.	No risk identified.	-
LUDFORD	371	374	401	No	0	-	-	-	-	-
MABLETHORPE	19316	19657	20780	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Climate change will have increased risk of tide locking outfalls. Bathing water. Permit at phosphate TAL.	No risk identified.	50% surface water run off removal.	-
MANBY	2281	2454	2616	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Permit close to phosphate TAL.	Networks - Mixed strategy with main solution of SuDS.	25% surface water removal.	-
MAREHAM LE FEN	843	982	1040	No	0	-	-	-	-	-
MARKET STAINTON	17	17	18	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
MARSTON (LINCS)	61569	73613	77587	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	Climate change will impact frequecy of high flows.	WRC - Increase process capacity. Networks - Attenuation.	10% surface water removal.	-
MARTIN	1256	1459	1527	Yes	0	WRC compliance Environment and wellbeing	-	Infiltration reduction.	No risk identified.	-
METHERINGHAM	4403	5113	5354	Yes	0	WRC compliance Environment and wellbeing	-	WRC - Increase process capacity.	WRC - new permit with increase capacity.	-
MINTING	137	138	148	No	0	-	-	-	-	-
NAVENBY	3071	3565	3732	Yes	0	WRC compliance Environment and wellbeing	-	Wait and see.	Customer education and water efficiency.	-
NETTLEHAM	4708	5368	5502	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Permit close to phosphate TAL.	Networks - Mixed strategy with main solution of SuDS.	25% surface water removal.	-
NEW LEAKE	291	292	311	Yes	0	WRC compliance Environment and wellbeing	-	Wait and see.	Wait and see.	-
NOCTON (RAF)	677	788	826	Yes	0	WRC compliance Environment and wellbeing	-	Investigate.	Wait and see.	-
NORTH CARLTON	60	68	70	No	0	-	-	-	-	-
NORTH HYKEHAM	19698	22870	23946	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution of SuDS.	50% surface water removal.	-
OASBY MILL LANE	122	118	122	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
OLD BOLINGBROKE	263	265	285	No	0	-	-	-	-	-
OLD LEAKE-SKIPMARSH LANE	2650	2739	2853	Yes	0	WRC compliance Environment and wellbeing	-	-	No risk identified.	-
OSBOURNBY	691	804	842	Yes	1	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
PICKWORTH (GRANTHAM)	18	18	18	No	0	-	-	-	-	-
PICKWORTH CHURCH LANE	105	100	104	No	0	-	-	-	-	-
REEPHAM (LINCS)	7428	8446	8652	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	Permit at phosphate TAL.	-	WRC - new permit with increase capacity.	-
ROWSTON	1363	1584	1659	No	0	-	Groundwater ingress potential.	Infiltration reduction.	-	-
SALTFLEET	655	658	687	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	Wait and see.	-
SALTFLEETBY ST PETER	173	174	187	No	0	-	-	-	-	-
SAXILBY	4066	4635	4750	Yes	1	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
SCAMPTON RAF	1646	1876	1922	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
SIBSEY	1664	1972	2079	Yes	0	WRC compliance Environment and wellbeing	-	-	WRC - transfer to another catchment.	-
SILK WILLOUGHBY	304	354	371	No	0	-	Potential wetland option.	-	-	-
SKELLINGTHORPE	5323	6089	6349	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	Wait and see.	Infiltration reduction.	-
SKENDLEBY	34	34	37	No	0	-	-	-	-	-
SKILLINGTON	381	366	379	No	1	-	-	-	-	-
SLEAFORD	18529	21499	22508	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Infiltration reduction.	Infiltration reduction.	-
SLEAFORD DROVE LANE (WP)	100	104	105	No	0	-	-	-	-	-
SOUTH HYKEHAM	4529	5240	5482	No	0	-	-	-	-	-
SOUTH KYME	759	882	923	Yes	0	WRC compliance Environment and wellbeing	-	-	No risk identified.	-
SOUTH RAUCEBY	459	534	559	No	0	-	-	-	-	-
SOUTH WITHAM	1943	2012	2076	No	1	-	Permit close to phosphate TAL.	-	-	-
SPILSBY	4263	4856	5143	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution of SuDS.	WRC - new permit with increase capacity.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
									Customer education and water efficiency.	
SPRIDLINGTON	41	47	48	No	0	-	-	-	-	-
STAINBY	35	34	35	No	0	-	-	-	-	-
STICKNEY	1330	1358	1455	Yes	1	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
STRUBBY	561	565	606	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
STUBTON	52	50	52	No	0	-	-	-	-	-
STURTON BY STOW	1624	1852	1898	Yes	0	WRC compliance Environment and wellbeing	-	Wait and see.	Infiltration reduction.	-
SUTTERTON-ROPERS LA	44	43	45	No	0	-	-	-	-	-
SWATON	164	190	199	No	0	-	-	-	-	-
SWINDERBY	2014	2333	2441	Yes	0	WRC compliance Environment and wellbeing	-	Wait and see.	WRC - increase process capacity with potential wetland. Or transfer to another catchment.	-
SWINESHEAD (LINCS)	3128	3983	4093	Yes	0	Escape from sewers WRC compliance Environment and wellbeing	-	-	Wait and see.	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
TATTERSHALL BRIDGE	159	182	190	No	1	-	-	-	-	-
TETFORD	602	606	651	No	0	-	-	-	-	-
THEDDLETHORPE SILVER ST	198	198	201	No	0	-	-	-	-	-
TOYNTON	331	333	357	No	0	-	Potential wetland option. FDGiA scheme underway.	-	-	-
UPTON (LINCS)	1088	1240	1271	No	0	-	Potential wetland option.	-	-	-
WAINFLEET	2383	2620	2783	Yes	1	Escape from sewers WRC compliance Environment and wellbeing	-	No risk identified.	Wait and see.	-
WASHINGBOROUGH	3585	4166	4363	Yes	2	Escape from sewers WRC compliance Environment and wellbeing	-	Networks - Mixed strategy with main solution of SuDS.	Increased conveyance in network.	-
WELTON (WTW)	3	3	3	No	1	-	-	-	-	-
WELTON LE MARSH (WTW)	4	4	4	No	0	-	-	-	-	-
WILLINGHAM	541	617	632	Yes	0	WRC compliance Environment and wellbeing	-	No risk identified.	No risk identified.	-
WILSFORD	465	541	567	No	0	-	-	-	-	-

L3 water recycling catchment	2021 population	2035 population	2050 population	Passed RBCS	Resilience risk score	Planning objective themes reviewed	Stakeholder concerns / comments	Medium term strategy	2050 Strategy	Partnership opportunities identified
WOODHALL SPA	4193	4739	5034	Yes	0	WRC compliance Environment and wellbeing	-	-	Wait and see.	-
WRAGBY	2078	2147	2301	No	0	-	Permit at phosphate TAL.	-	-	-

14. Final words

We've proposed a plan that's resilient and adaptable to change, and a plan that enables us to work with our stakeholders to achieve all the goals. Thank you to our stakeholders for supporting the creation of this plan.

Please remember this technical document should be read as a supplement to the summary document which can be found on our website.

We know that changes over the next 25 years may impact this plan and new technology may come in which will alter our direction. Growth may also follow a differing trajectory, and climate change may be more, or less intense than projected. That's why we'll continue to monitor everything before implementing solutions. We'll also review everything again in five years' time.

To discuss anything further, you can contact us atDWMP@anglianwater.co.uk

15. Glossary

Table 76

Acronym	Extended	Definition
AQMA	Air quality management area	An area within a local authority assessed for it's quality.
AONB	Areas of outstanding natural beauty	An area of countryside designated for conservation.
AMP	Asset Manaagement Plan	A five-year time period used in the English and Welsh water industry. The water regulator Ofwat uses each AMP period to set the allowable price increase for consumers.
AMP7		2020-2025
ADEPT	Association of Directors of Environment, Economy, Planning and Transport	A group of directors who are responsible for providing day to day services.
	Attenuation ponds	Reservoirs in the countryside are part of the solution to stormwater management and surface water runoff to avoid downstream flooding.
BRAVA	Baseline risk and vulnerability assessment	Stage 3 of the DWMP.
BNG	Biodiversity Net Gain	An approach which aims to leave the natural environment in a measurably better state than beforehand.
	Blueprint for Water	A coalition of environmental, water eficieny, fisheries and recreational organisations.
CaBA	Catchment Based Approach areas	A partnership group aiming to maximise the benefit to the environment.
	Combined sewer	Sewer with a system of pipes, tunnels and pumping stations to transport sewage and urban runoff together to a WRC of disposal site.
CSO	Combined sewer overflow	A release point in the sewerage network.
CAF	Common assessment framework	A framework designed to help companies which are using quality management techniques to improve their performance.
Defra	Department for Environment, Food and Rural Affairs	The government department responsible for the protection of the environment, food production and standards, and rural communities.
dDWMP	Draft Drainage and Wastewater Management Plan	These plans are the new way for organisations to work together to improve drainage and environmental water quality.
DWMP	Drainage and Wastewater Management Plan	

Acronym	Extended	Definition
DWF	Dry Weather Flow	A statistical assessment of flow into the WRC.
	Effluent	An outflowing of water to a natural body of water from a WRC.
EPA	Environmental Performance Assessment	An assessment the Environment Agency makes of water companies.
EDM	Event duration monitoring	Measures the frequency and duration of spills to the environment from storm overflows using Defra's 12/24 spill counting methodology.
	Exceedance pathways	A pathway to move floodwater away from properties.
	Exceedance storage	Places to store exceedance runoff.
FFT	Flow to full treatment	The maximum flow a WRC can treat.
	Fluvial	Flooding related to rivers.
	Foul water drainage	The system of pipework that carries wasewater away.
	Green roof	A roof that's covered in plants, which reduces stormwater runoff.
	Greywater	Waste bath, sink and washing water.
HRA	Habitats Regulations Assessment	An assessment to meet the Habitats and Species Regulations (2017)
	Hydraulic modelling	Using a collection of mathematical equations to provide a simple representation of reality. This will estimate flow, water level and velocity in river channels and pipe networks for example.
IRZ	Impact Risk Zone	An area around SSSI.
IDB	Internal Drainage Board	A local public authority that manages water levels.
INNS	Invasive and non-native species	Species in an area outside of their natural range.
LLFA	Lead Local Flood Authority	Lead in managing the local flood risks.
LTDS	Long Term Delivery Strategy	A plan provided by the water companies to Ofwat.
	Ofwat	The UK water regulator, responsible for overseeing the 32 private water companies.
	Optioneering	The in-depth consideration of various alternatives and options to find the best or preferred option.
ODA	Options development appraisal	Stage 5 in the DWMP.

Acronym	Extended	Definition
	Pluvial	Flooding related to heavy rain.
	Potable water	Water that is safe to drink.
PR19	Price Review 2019	This is the 2019 'Price Review' for water companies in England and Wales. It's a process led by water regulator Ofwat to determine prices for the period 2020-2025.
PR24	Price Review 2024	Our main business plan.
	Ramsar sites	Wetlands of international importance.
RFCC	Regional Flood and Coastal Committees	A group of members appointed by Lead Local Flood Authorities and appointed members.
RBCS	Risk based catchment screening	Stage 2 in the DWMP.
RMA	Risk Management Authorities	Those who deliver flood risk protection. Typically the LLFA, highways authorities, water and sewerage companies and the Environment Agency.
SSSI	Site of Special Scientific Interest	A formal conservation designation.
SAC	Special areas of conservation	A protected area of conservation.
SPA	Special protection areas	An area protected due to rare, vulnerable or migratory birds.
	Stakeholders	People, companies or organisations with an interest in our DWMP.
SO	Storm overflow	A release point in the sewerage network.
SOAF	Storm Overflow Assessment Framework	Guidance from the Environment Agency.
SDS	Strategic Direction Statement	A document outlining the long term aims and ambitions of the company.
	Surface water drainage	The system of pipework that carries rainwater away from gutters, driveways, roads. The rainwater, which is not contaminated and hence is not harmful, will be transported to a stream or river.
SuDS	Sustainable Drainage Systems	These are a natural approach to managing drainage in and around properties and other developments. SuDS work by slowing and holding back the water that runs off from a site, allowing natural processes to break down pollutants.
	Swales	Shallow, broad and vegetated channels designed to store and/or convey runoff and remove pollutants.

Acronym	Extended	Definition
	Trade effluent	A liquid waste (effluent), other than surface water or domestic sewage, discharged from premises being used for a business, trade or industrial process.
WFD	Water Framework Directive	A European Directive to manage, protect and improve the water environment.
WINEP	Water Industry National Environment Programme	This is the programme of work water companies in England are required to do to meet their obligations from environmental legislation and UK government policy.
WRC	Water Recycling Centre	Where sewerage is treated before being returned to the environment.
WRE	Water Resources East	A group planning to safeguard the future supply of water to the East of England.
WRMP	Water Resources Management Plan	The 25 year strategic plan for water.
WTW	Water Treatment Works	Where water is treated before being put into supply.
	Water UK	The trade association representing the water companies of the United Kingdom

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