



Chapter SRN06

# Wholesale Wastewater

(Costs and Outcomes)

# 6. Wholesale Wastewater (Costs and Outcomes)

## 6.1. Executive summary

This chapter explains our investment to increase the resilience of our wastewater systems, enhance water quality, enable new housing growth and protect and improve our environment.

Every day our 39,973 kilometres of sewers and 3,499 pumping stations transport on average 1.3 billion litres of wastewater and rainwater from our 4.9 million customers' homes and businesses, and from the drains outside. This water is carefully treated and recycled to strict standards at our 363 treatment works before being returned to the environment.

We know we need to improve our performance to meet the expectations of our customers and regulators to increase the confidence and trust they have in us. We are working hard to improve our performance. We are delivering these improvements through our [Turnaround Plan](#).

From 2020, we have focused on reducing pollution incidents, improving our compliance and becoming more proactive in how we respond to issues.

We installed 24,000 monitors to track flows in sewers and created a proactive control centre, supported by artificial intelligence, to identify blockages and pump failures before they occur so we can respond faster to prevent damage to homes or the environment. In the first six months of 2023 the percentage of blockages we proactively identified increased from 2% to 16%.

The Environment Agency has recognised the improvements we are making by awarding us two stars for environmental performance in 2023 – up from one star the previous year<sup>1</sup>. We are aiming to achieve a three star performance rating by 2025 and have already delivered significant improvements on pollution incidents, discharge compliance and sewer flooding<sup>2</sup>.

Our customers – rightly – expect us to continue improving the essential services we provide and enhance how we protect our environment<sup>3</sup>. Discharges from storm overflows, regardless of whether they are permitted, are not acceptable. They expect us to accommodate new homes while protecting water quality and to do more to reduce pollution and improve our compliance.

However, our region and services face severe challenges:

- The climate emergency, particularly in the South-East, means droughts and heavy storms are more severe and frequent than before and have become the norm<sup>4</sup>
- Our communities are growing rapidly – with growth hotspots like new garden cities and new homes across our region. More than 40%<sup>5</sup> of our communities are in coastal areas, making it challenging to expand and upgrade our existing assets
- The need to protect and improve the environment, and the ecosystems that depend on it, is now greater than ever.

Overall, we plan to invest £4.1 billion<sup>6</sup> in our wastewater services between 2025 and 2030 to:

- Reduce our use of storm overflows by a further 12% across 179 priority sites (a 38% reduction from our 2020 baseline)
- Reduce overall pollution incidents by 67% and eliminate serious pollution incidents
- Accommodate over 86,000 new homes by 2030, including by building a new treatment works at Whitfield near Dover
- Improve water quality in over 1,000km of rivers by 2030
- Two new advanced bioresources treatment centres, improving product quality and increasing power generation

We plan to invest £3 billion over the next 25 years to reduce discharges from storm overflows to prevent environmental harm and protect public health. This starts by investing £682 million<sup>7</sup> between 2024 and 2030 to stop a further 2,500 spills – prioritising sensitive waterbodies in rivers as well as shellfish and bathing waters along the coast.

We will also invest £559 million between 2025 and 2030 to improve the recycling of wastewater to remove more nutrients such as phosphorous and nitrogen from our discharges before they are released back to the environment.

Reducing our use of storm overflows and enhancing our wastewater treatment works will improve water quality in over 1,000km of rivers, as well as in the harbours, estuaries and the sea.

1 [Southern Water EPA data report 2022](#)

2 Refer to Table 1: Wastewater AMP7 Performance

3 See chapter [SRN03: Customer Acceptability](#)

4 [SRN48: Operational Resilience technical annex](#)

5 [SRN20: Coastal Population Cost Adjustment Claim](#)

6 Includes £497m delivered via alternative delivery

7 Includes schemes being delivered through the alternative delivery approach

We are forecasting significantly higher than average levels of growth between 2025 and 2030. This means we need to enhance capacity at 38 wastewater treatment<sup>8</sup> works to make sure we continue to protect bathing waters, SSSIs and other sensitive habitats. We will also need to provide additional capacity in our sewer network to ensure new developments do not increase the risk of flooding for other customers.

Extreme weather events are happening more often and are expected to become more common in the future. We will improve the resilience of our most at-risk sites and use what we learn to identify sites and solutions for future AMPs.

We will build on the improvements we have already made – investing through our maintenance plans to improve the health and reliability of our critical assets. Asset data and modelling is becoming even more important to support these improvements, requiring us to complete the rollout of new GIS, maintenance systems and network models.

Our plans will deliver a step change in our performance, capabilities and capacity – and our customers and communities will see tangible benefits. Our customers support our plans<sup>9</sup> – but this depends on us delivering our promises.

## 6.2. Our context

### 6.2.1. Our region, environment and communities

We operate in 11 river basin catchments across Kent, Sussex, Hampshire and the Isle of Wight. Our region is home to over 4.9 million people and is rich in areas of national and international environmental importance.

This includes:

- 84 designated bathing waters – with 57 currently classified as excellent
- 3,400km of rivers
- 20 marine conservation zones
- More than 700 miles of coastline

The map below shows the scale of environmental designations across our region.

Bathing and shellfish waters are vital for our local communities, and our customers expect us to do more to protect and improve them.

Our customers and communities have a strong connection to nature, especially our coastline, and it’s important for their wellbeing. For many, it’s the reason they choose to live here.

*“On The Isle of Wight we are so reliant on tourism, it has taken a real drop recently. We need this to be addressed and addressed now. Do it all, and shout about it to bring tourism back.”*

**Non-Household Customer– Environmental Ambition Research**

Almost three-quarters of our customers regularly visit beaches and around 80% expect to be able to swim safely in the sea<sup>10</sup>.

However, when customers think water quality is poor 62% of them would stop their usual activities. It can also impact their overall wellbeing<sup>11</sup>.

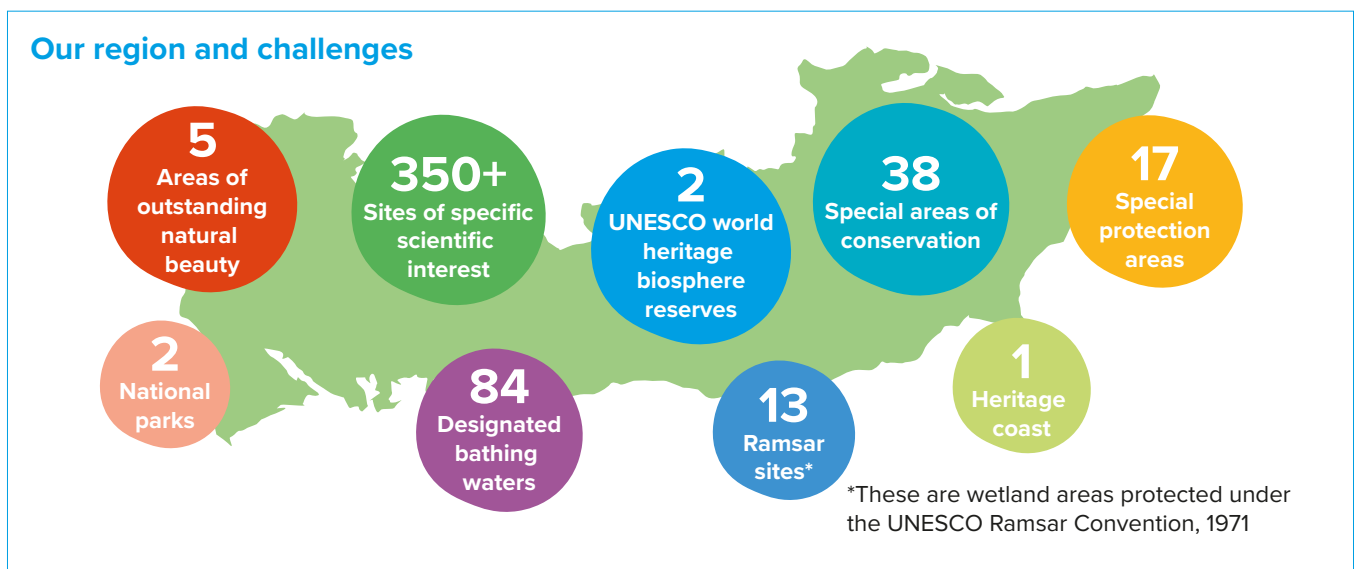


Figure 1: Our region and challenges

8 [SRN44: Wastewater Growth enhancement business case](#)

9 See chapter [SRN03: Customer Acceptability](#)

10 See chapter [SRN03: Customer Acceptability](#)

11 [SRN14: Customer Insight technical annex](#), Section 1 Index: 153 – Southern Water – Waterside wellbeing report – Oct ‘22]

### 6.2.2. Our AMP7 performance

We know we have fallen short in some crucial areas for our customers and stakeholders. We have been working hard to improve, be more transparent and start regaining our customers' trust.

We have one of the highest self-reporting pollution rates in the industry<sup>12</sup>. As part of our commitment to transparency we launched Beachbuoy in 2021, sharing near real-time information about stormwater overflows. We were the first company to make this information freely accessible to our customers.

We have enhanced how we capture and learn from data – helping us understand the root causes behind issues. We use this to develop our improvement plans – including our [Pollution Incident Reduction Plan](#) (PIRP), updated annually and published on our website.

In July 2023, the EA confirmed we had achieved a two-star environmental performance rating for 2022<sup>13</sup> – a step forward from the previous year. Forecasts for 2023/24 show significant improvements for pollution, flooding and treatment compliance – all key outcomes for our customers.

Table 1: Wastewater AMP7 Performance

Performance area	2020/21 baseline	2022/23 actual	2023/24 forecast	2024/25 target
<b>Total pollution (Cat 1 to 3)</b>	406	358	230	193
<b>Serious pollution (Cat 1 and 2)</b>	4	5	4	2
<b>Discharge permit compliance</b>	97.1%	98.2%	99.1%	99.1%
<b>Internal flooding</b>	393	456	365	274
<b>External flooding</b>	4,409	3,748	3,702	3,525
<b>Sewer collapses</b>	315	248	250	250
<b>Bathing waters at excellent</b>	60	57	57	57

Bathing water quality has been improving steadily since 2007. There are many different impacts on bathing water quality, so partnership working is crucial. We provide technical, analytical and investigative support to local authorities, regulators and other stakeholders to make improvements. For example, our dedicated misconnections team identifies problems which the local authority can resolve.



### Working collaboratively to improve bathing water

A misconnection can occur where DIY or property development connects foul water into the surface water system, taking the untreated sewage out into the environment and bathing water areas.

We set up our misconnection team in 2019 to investigate the surface water network in coastal locations. In 2022 the team identified almost 100 properties with misconnected pipework, and 370 separate facilities including 58 toilets.

In most cases it is the homeowners' responsibility to fix misconnections. Following a series of tests to confirm the connection, a letter is sent to the customer. In the last four years, we have only had to rely on our strong relationships with local authority Environmental health teams to enforce a homeowner to rectify an issue.

In addition to proactively investigating surface water catchments and resolving poorly connected properties, the team also identifies operational issues in our networks. This approach has resulted in 140 issues such as blockages and pollutions being prevented since 2019.

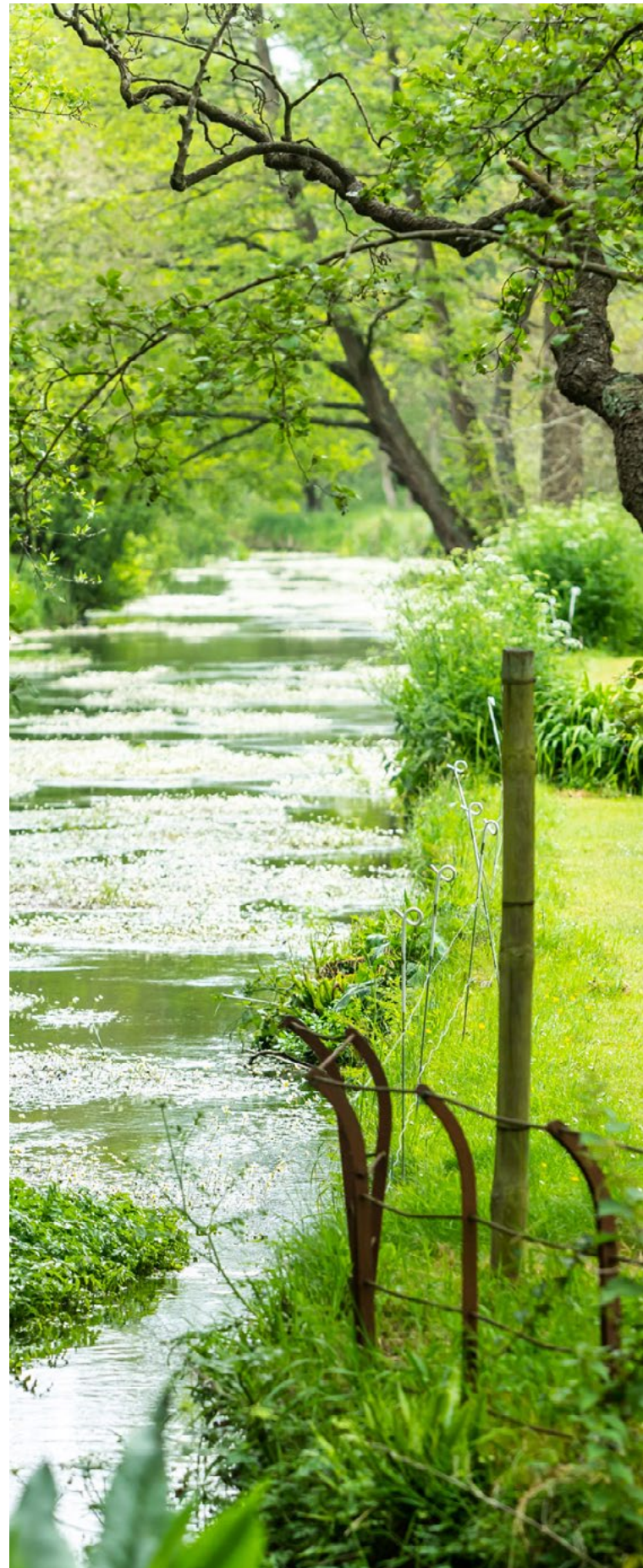
<sup>12</sup> Environment Agency: Water and sewerage companies in England: environmental performance report

<sup>13</sup> [Southern Water EPA data report 2022](#)

### 6.2.3. AMP7 delivery

Since 2020 we have:

- Installed nearly 24,000 sewer level monitors to digitise our network and enable us to use machine learning to identify problems before they happen
- Created a new proactive control centre to prioritise emerging issues, acting on intelligence from our sewers and pumping stations rather than waiting for events to happen
- Started using our annual PIRPs to find and fix the root causes of problems
- Established our Cleaner Seas and Rivers Task force to start reducing storm overflow spills and pilot nature-based solutions to inform our storm overflow plans
- Delivered 895 WINEP<sup>14</sup> schemes and investigations to date including:
  - Dozens of schemes that have improved water quality in more than 102km of river<sup>15</sup>
  - Installing new monitors on 263 storm overflows – increasing our coverage to 98.6% of our combined sewer overflows and keeping us on track to have 100% coverage by December 2023
  - 418 site-specific investigations with our regulators to target future investment – including schemes in our next WINEP<sup>16</sup>
- Connected 83,000 new homes and businesses to our network
- Delivered major rising main refurbishments at Lancing, Hastings and Margate to address repeat bursts
- Published our first Drainage and Wastewater Management (DWMP) plan and used our findings to inform our Long-term Delivery Strategy (LTDS) and Business Plan



<sup>14</sup> Includes 44 schemes from AMP6 with 2021 delivery dates

<sup>15</sup> Seven water quality schemes last year, improving water quality in 20.2km river – in addition to the 102.7km we improved in 2021 / 22

<sup>16</sup> [Southern Water Annual Report and Financial Statements – page 62](#)

### Pollution Incident Reduction Plan

Our 3,500 sewage pumping stations have caused over half of all pollution incidents (2022). Our plans led to a 28% improvement supported by a £37.5 million investment into pumps, valves and control systems. Asset availability increased by 8% through this investment, providing greater resilience.

Improvements are not just about additional investment, our processes and procedures have also been completely reviewed, including:

- Full review of our wet well cleaning programmes
- Black start testing on critical pumping stations to test standby power supplies
- Full health check at top 280 pumping stations, causing 90% of historic incidents. Remedial work underway but continuing into AMP8
- New human factor practitioner role to understand and reduce human error, supported by incident learning cycle.

We have also built strong local partnerships that are starting to deliver benefits for our customers, communities and environment. This is crucial for our Three Harbours Strategy. (See section 6.2.4.5.)

#### 6.2.4. Trends, challenges and opportunities

The world around us is constantly changing and this impacts how we provide our services. We have identified different trends, challenges and opportunities and how they will change what we do in the future.

We are predicting the highest amount of housing growth of any wastewater company<sup>17</sup>, and we need to make sure we are able to support this. Climate change means extreme weather events are becoming more frequent. This places greater strain on our networks, as well as our environment.

Customers', stakeholders' and regulators' expectations have changed rapidly since our last Business Plan, especially around the environment. Technology is developing rapidly, and we need to make sure we take advantage of new opportunities while being mindful of new threats.

##### 6.2.4.1. Supporting a growing population

Our region has one of the fastest growing populations in the country, with annual housing growth forecast at 0.85% per year compared to an industry average of 0.63%<sup>18</sup>. Over the next five years we will have 86,000 new property connections with an additional 190,000 people. By 2050 we predict serving 800,000 more people – including at new garden cities and communities in Kent and Hampshire<sup>19</sup>.

We need to make sure our wastewater networks – our treatment works, pumping stations and sewers – have enough capacity to serve new customers. We also need to make sure extra development doesn't increase the

amount of surface water entering our sewers. Currently 65% of storm overflow spills are due to rainwater entering our sewers<sup>20</sup>.

Housing growth in some areas is slowed because new homes will increase nutrient levels in environmentally important water bodies. The Levelling Up and Regeneration Bill will require us to upgrade our treatment works to the highest standards in these priority catchments. This will help achieve nutrient neutrality – protecting the environment while enabling housing growth.

We need to balance the needs of growth with making sure we protect and improve the environment. It is hard to accurately forecast how many people will live in our region over the long-term, so we have made sure we can adapt our plans to the number of new homes we see.

##### 6.2.4.2. Adapting to climate change and more extreme weather

Any weather event, such as a storm, drought or freeze / thaw, that interrupts our services are called 'loss events'. These are becoming more frequent and climate change means they will happen more often in the future. We need to protect our assets to make sure we can continue providing services to our customers and protecting the environment.

More intense storms can cause our sewers to become overfilled or lead to power outages, which increase the risk of pollution and flooding. Hotter, drier summers have different impacts on our sites – such as them overheating and shutting down for safety reasons.

Because so much of our region is coastal, many of our sites and sewers are at risk from coastal erosion<sup>21</sup>. This is also being made worse by climate change.

17 [See SRN22: Network and Wastewater Treatment Works growth Cost Adjustment Claim](#) and [SRN44: Wastewater treatment works growth enhancement business case](#)

18 Ofwat, PR24 Cost Assessment Master Dataset, Wholesale Wastewater base costs April 2023

19 [Summary of our Drainage and Wastewater Management Plan 2025–50](#)

20 [SRN40: WINEP – Storm Overflows enhancement business case](#)

21 [SRN53: Resilience – coastal enhancement business case](#)

### Increasing loss events

Met Office data\* shows loss events have increased from just over 200 in 1980 to more than 800 in 2019.

Over the past 5 years we have been impacted by 33 named storms, which has resulted in disruption to service and 414 pollution events.

*\*Met Office Extreme Weather Events and Climate*

We have seen:

- Increased rainwater flow in our wastewater network – which can quickly overwhelm our sewers and pumping stations
- High groundwater during wetter winters which can infiltrate sewers and the excess flows can cause flooding and pollution issues. Before 2000, high infiltration periods typically occurred every 10 years, however there have been two similar periods in the last 5 years (2019/20 to 2020/21 and 2022/23)
- Some of our sites are vulnerable to flash flooding, causing pumping stations and treatment works to either stop working or operate at reduced capacity
- A growing number of sites being impacted by hotter summers causing some equipment to overheat and then stop working so they do not become damaged
- Storm Eunice in 2022 caused 365 of our pumping stations to lose power across our region, representing 10% of our total pumping stations<sup>22</sup>

#### 6.2.4.3. More significant environmental improvements

Our customers expect us to do more to enhance and protect our environment for future generations<sup>23</sup> – and this is reflected in recent legislation and targets. Protecting and improving our environment is the biggest investment driver across our plan.

Our environmental programme, WINEP, has more than 80 different legal and regulatory drivers behind it. These include the Environment Act, the Water Framework Directive, Urban Wastewater Treatment Directive, Bathing Water regulations and the Farming Rules for Water.

Many of these require us to meet new standards such as significantly reducing our use of storm overflows, changing how we store bioresources and treating wastewater to higher standards to protect water quality in rivers and coastal areas.

Significant changes in public opinion and expectations since our last Business Plan have been reflected by Government and regulators in [The Environmental Improvement Plan](#). This requires water companies to:

- Protect all designated bathing waters and the majority of our most sensitive and protected habitats from storm sewage discharges by 2035
- Eliminate all adverse ecological impact from storm overflows by 2050
- Ensure all storm overflows discharge less than an average of 10 times per year by 2050

#### 6.2.4.4. The increasing pace of change

Technology is changing rapidly, and we need to make sure we keep up. The pace of change opens opportunities to do things differently. It also creates new risks if we fall behind.

New digital capabilities, like AI and machine learning, alongside better, more accurate sensors, can give us new insights into how our networks work. Other new technology can make our processes more efficient or effective – or mean we can do things in new ways.

We installed 24,000 sewer monitors and are using machine learning to understand how our network operates. Our XXXXXXXXXX system analyses data from our monitors and can predict when an issue might occur – and whether that is due to a blockage, pump failure or rainwater. This means we can proactively find and fix potential problems.

Customers also want us to do things in different ways. Where possible, they want us to use nature-based solutions first. This can be a challenge for some objectives, like meeting tighter permits, but means we are able to consider solutions that provide wider benefits<sup>24</sup>.

Using more nature-based solutions opens new partnership opportunities and means we can build on our existing relationships. They can also reduce the amount of carbon we release and enhance biodiversity. Our customers expect us to put nature-based working at the heart of our planning to maximise the benefits we provide our communities and environment.

However, if we can't take advantage of these opportunities we risk falling behind and having to rely on more traditional ways of working. These are more predictable, but do not deliver the wider, long-term benefits we want.

Increasing our digital capabilities can also expose us to cyberattacks and other threats. We need to make sure we protect our infrastructure and have resilient systems in place to cope with new challenges.

<sup>22</sup> [SRN49: Resilience – Power enhancement business case](#)

<sup>23</sup> See chapter [SRN03: Customer Acceptability, Section 3](#)

<sup>24</sup> See chapter [SRN03: Customer Acceptability, Section 3.2](#)

#### 6.2.4.5. Partnerships and collaboration

We are working in partnership to improve water quality in three environmentally important harbours in Hampshire and West Sussex.

The three harbours contain designated shellfish waters, SSSIs, SACs, SPAs, Ramsar sites and an Area of Outstanding Natural Beauty, among others. The area also contains groundwater sources used by Portsmouth Water to supply drinking water. Despite this high level of protection, the condition of nature in some areas has been assessed by Natural England to be in an unfavourable declining position<sup>25</sup>.

We are already investing £72 million to upgrade the seven largest wastewater treatment works that release into the harbours and nearby rivers. This includes how much wastewater can be treated, building extra stormwater storage and adding new treatment facilities. This work due to be completed by 2025, will improve water quality in the harbours.

The impact of wastewater treatment is comparatively small compared to the nutrient load from other sources. We are working in partnership with our regulators and other parties whose activities have an impact on the harbours to reverse their decline, restore and enhance these precious environments.

We have established a Three Harbours Technical Working Group to develop an integrated long-term plan, focused on improving water quality, enhancing natural capital and increasing biodiversity in these important habitats.

We are applying what we have learned from this project to new partnerships and ways of working. Our WINEP includes proposals to continue supporting the integrated Three Harbours plan, share data across agencies, use citizen science to contribute to our investigations and enable partnership working.

#### Bluewave and our Innovation Hub

Our Bluewave innovation lab has developed an enduring partnership with the University of Portsmouth to work on wastewater challenges through our Innovation Hub based at our Petersfield Wastewater Treatment Works.

This includes a rolling series of trials based around the test-bed facilities at our Environmental Technology Field Station aimed at understanding how we can apply new, innovative solutions and approaches to our emerging challenges. This unique facility has extensive research and testing equipment, and our partnership means we can use the specialist equipment at the University of Portsmouth.

The Hub has supported projects on removing phosphorous at small sites where conventional approaches are less appropriate – as well as new approaches to meeting tighter consents that can be scaled up to our larger works. We have also worked on solutions to remove heavy metals during the treatment process and increase biogas production.

Our collaborative trials of commercially available absorptive media identified a new reactive media (Polonite) to be installed at our East End wastewater treatment works to meet tighter water quality standards.





### 6.3. Preparing for the future

We know the challenges we face and the opportunities we have to do things differently. We also know what our customers, communities and stakeholders expect from us.

We used this insight to develop three linked plans that have all informed our Business Plan:

- Our Turnaround Plan is delivering short, sharp improvements by 2025 to set us up to deliver our Business Plan
- Our Drainage and Wastewater Management Plan (DWMP) is our first 25-year look at the investments we need to make in our wastewater network across our region
- Our Long-term Delivery Strategy combines our DWMP, with our Water Resources Management Plan and the other activities we need to do to enhance our resilience over the next 25 years

We have explained more about each of these below.

#### 6.3.1. Our Turnaround Plan

We are committed to improving our waste and environmental performance. By 2025 we aim to have been awarded a three-star performance rating from the Environment Agency. We will achieve this by:

- Building capacity and resilience at our wastewater treatment works to reach 99%+ compliance with treatment and permit standards
- Making sure our assets are reliable and work to capacity. Updating our maintenance standards and proactive control to minimise the risk of assets failing, and an improved emergency response
- Digitalising our sewer network to reduce pollutions and flooding, using industry-leading monitors, artificial intelligence for prediction and maintenance
- Improving training, development and productivity by upskilling our front-line colleagues. Making sure they are multi-skilled and externally accredited to deliver the service our customers expect

#### 6.3.2. Our Drainage and Wastewater Management Plan

We published our first [Drainage and Wastewater Management Plan \(DWMP\)](#) in May 2023. It explains the current and future challenges our drainage and wastewater systems face and how we will address them.

It looks at each of our 381 sewerage systems, understanding the current and future risks. Through it, we identified a need for £7.7 billion of additional investment over the next 25 years, with an emphasis on tackling issues at source, working with nature and delivering wider multiple benefits for our customers and their communities.

We developed our DWMP collaboratively, working with 75 organisations across our region. With their input we identified 14 key planning objectives, building on the six common objectives used across the industry<sup>26</sup>. These longer-term objectives align well with shorter term WINEP regulatory targets, providing a more integrated assessment of needs.

Our DWMP has been the key source of information for our Long-term Delivery Strategy – identifying the actions we need to take and the different scales of challenge we could face up to 2050.

#### 6.3.3. Our Long Term Delivery

Our Long Term Delivery Strategy (LTDS) explains what we need to do over the next 25 years to protect and enhance our environment, improve water quality and increase the resilience of our wastewater services. It is based on our DWMP and our bioresources strategy.

It is an adaptive plan, meaning it might change over time depending on the impacts of climate change and population growth – as well as how technology changes, the benefits of nature-based solutions and potential regulatory changes.

Our bioresources strategy<sup>27</sup> sets out the challenges, assesses options and sets out our long-term proposals to deliver them. We plan to move to Advanced Anaerobic Digestion, starting in Kent, to provide the foundation for moving to advanced thermal conversion.

26 All 14 planning objectives can be read on our website: [www.southernwater.co.uk/dwmp/planning-objectives](http://www.southernwater.co.uk/dwmp/planning-objectives)

27 See [SRN36: Bioresources Strategy technical annex](#) and [SRN21: Advanced Digestion Cost Adjustment Claim](#)

Our LTDS adaptive pathways are shown below:

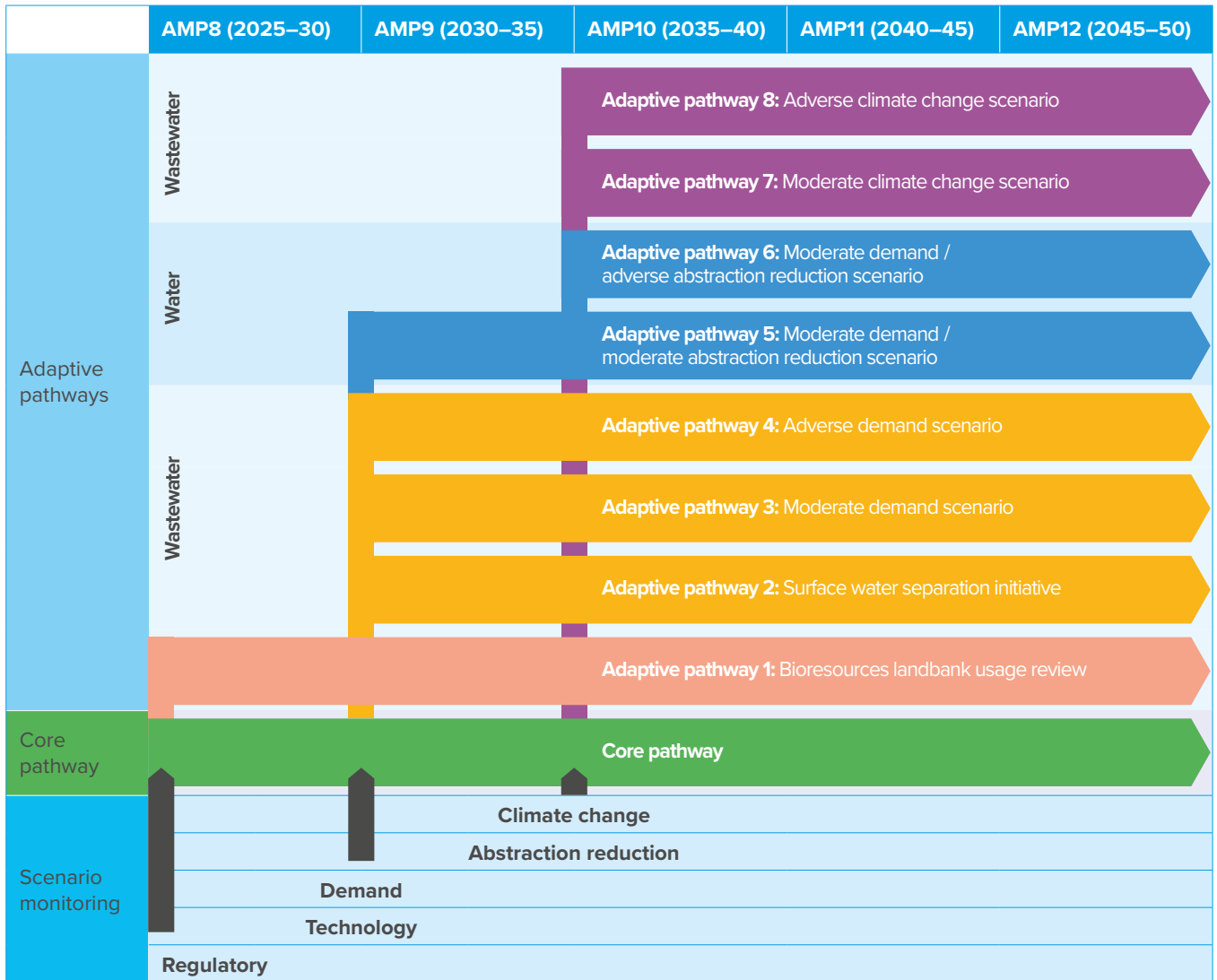


Figure 2: Our LTDS adaptive pathways

### 6.3.3.1 Our Long-term Strategic Delivery themes

We have four strategic delivery themes in wastewater and our investments sit under at least one. Our themes and some key investments under each are below.

We will improve **Network flow management to reduce flooding and spills** by:

- Using sustainable drainage systems, such as swales, raingardens, ponds, to slow the flow of water to allow existing drainage systems to drain water away over a longer period of time
- Building new, or increasing the capacity of existing, storage tanks after we've used nature-based solutions as much as we can
- Increase the capacity of our wastewater pumping stations, storage tanks and sewers – including building new ones if we need to.

We will enable **Recycling wastewater and nutrient removal** by:

- Increasing and enhancing biological treatment capacity to meet new and emerging environmental standards
- Testing and adopting nature-based solutions and innovative treatment processes
- Developing stronger partnerships to develop long-term action plans to improve water quality – including through our Three Harbours Strategy

We will increase our **Asset health and resilience** by:

- Delivering a step-change in the use of monitors and artificial intelligence to identify emerging issues before they cause pollution or flooding. For example, we have installed 24,000 sewer level monitors so we can proactively identify blockages and failures
- Carrying out a full review of our asset maintenance programmes, revising our maintenance strategies and care plans to improve the resilience of our treatment works and pumping stations and reduce the risk of breakdowns
- Taking a proactive approach to identify future resilience risks, developing and delivering targeted enhancement business cases where we are vulnerable to future shocks and stresses.

We will **treat and dispose of bioresources** by:

- Transitioning to advanced anaerobic digestion to enhance operational resilience, improve the product quality for agriculture and increase renewable power generation
- Consolidate our asset base – starting in Kent where we will consolidate seven sites into two

- Trialling Advanced Thermal Conversion technology which, if successful, would improve our efficiency, lower our emissions and increase how much renewable energy we can generate

### 6.3.4. What our customers and stakeholders told us<sup>28</sup>

Our plan is informed by our most detailed customer engagement ever. More than 25,000 customers spent over 8,000 hours via over 190 different reports telling us what they think to develop our plan. We combined this with over 10 million data points from sources such as contacts, complaints, social listening and other sources.

Our customers and communities have strong links to their natural environment and their biggest priority for us is protecting and improving our environment:

- 86% agree 'the environment is more important today than it has ever been before'
- 58% agree and only 16% disagree that "we should do everything we can to protect the environment, even if it means bills rise"<sup>29</sup>

They expect us to work with nature first, wherever possible, and look for ways to deliver wider environmental benefits:

- 65% agree that Southern Water needs to first invest in things that have the greatest environmental benefits, and anything else afterwards' (only 14% disagree)<sup>30</sup>

Our customers want us to be more ambitious in some areas, like storm overflows, but not at the detriment of our core services – even if that means being less ambitious in other areas:

- 93% preferred a proposed plan going further on storm overflows, phasing nutrient removal (to focus on high areas first) and improving resilience and sewer infiltration<sup>31</sup>

This insight has shaped our ambition as well as how we will deliver the improvements our customers and communities expect. More information about our customer engagement is in chapter SRN03: Customer Acceptability and SRN14: Customer Insight technical annex.

28 For more details about our customer insight see chapter [SRN03: Customer Acceptability](#)

29 Both from [SRN14: Customer Insight technical annex](#), Section 1 Index: 201d – Water Futures Quant Wave 4 – Aug '23

30 [SRN14: Customer Insight technical annex](#), Section 1 Index: 201d – Water Futures Quant Wave 4 – Aug '23

31 [SRN14: Customer Insight technical annex](#), Section 1 Index: 107 – Environmental Ambition Results FINAL Report – June 2023

Table 2: Acting on customers' views

Customers told us...	So we...
reducing storm overflows and pollution are the most important thing. They want us to be ambitious, and pushed our original plans further...	...added the top spilling overflows, accelerated an additional 20 bathing water overflows into AMP8 and stretched our pollution target
to prioritise environmental benefits above everything else and work with others to improve our environment – especially when we are not the only ones responsible...	...developed our best value plan to prioritise environmental improvements and are leading partnerships like our Three Harbours Strategy
we should invest in the right long-term solution – putting nature first, working in partnership and embracing new technology – but only 41% trust us to design the right solution...	...developed a best value plan for storm overflows that delivers wider benefits, using best-practice guidance. We are learning from our experience, testing what works and investing in the right long-term solutions
increasing our resilience to climate change, coastal erosion and power failure is important – but expected us to have done some of this already	...increased our investment in operational resilience to meet new challenges – while addressing our previous performance through Botex
we should innovate and change how we work, especially to avoid incinerating bioresources, even if the technology has been used elsewhere already...	...developed our Bioresources Strategy to avoid having to incinerate bioresources and generate more renewable energy
to address the root cause of problems, rather than finding a quick fix...	...will continue using root cause analysis in PIRP and DWMP to identify where problems are, slowing the flow through nature-based solutions and working in partnership to protect water quality
we should invest now and not push problems to future generations – but we should keep bills affordable by focussing on delivering the biggest benefits first	...have phased some parts of our programme over eight years – delivering some short-term improvements and keeping bills fair for current and future customers

## 6.4. Our AMP8 plan

### 6.4.1. Summary

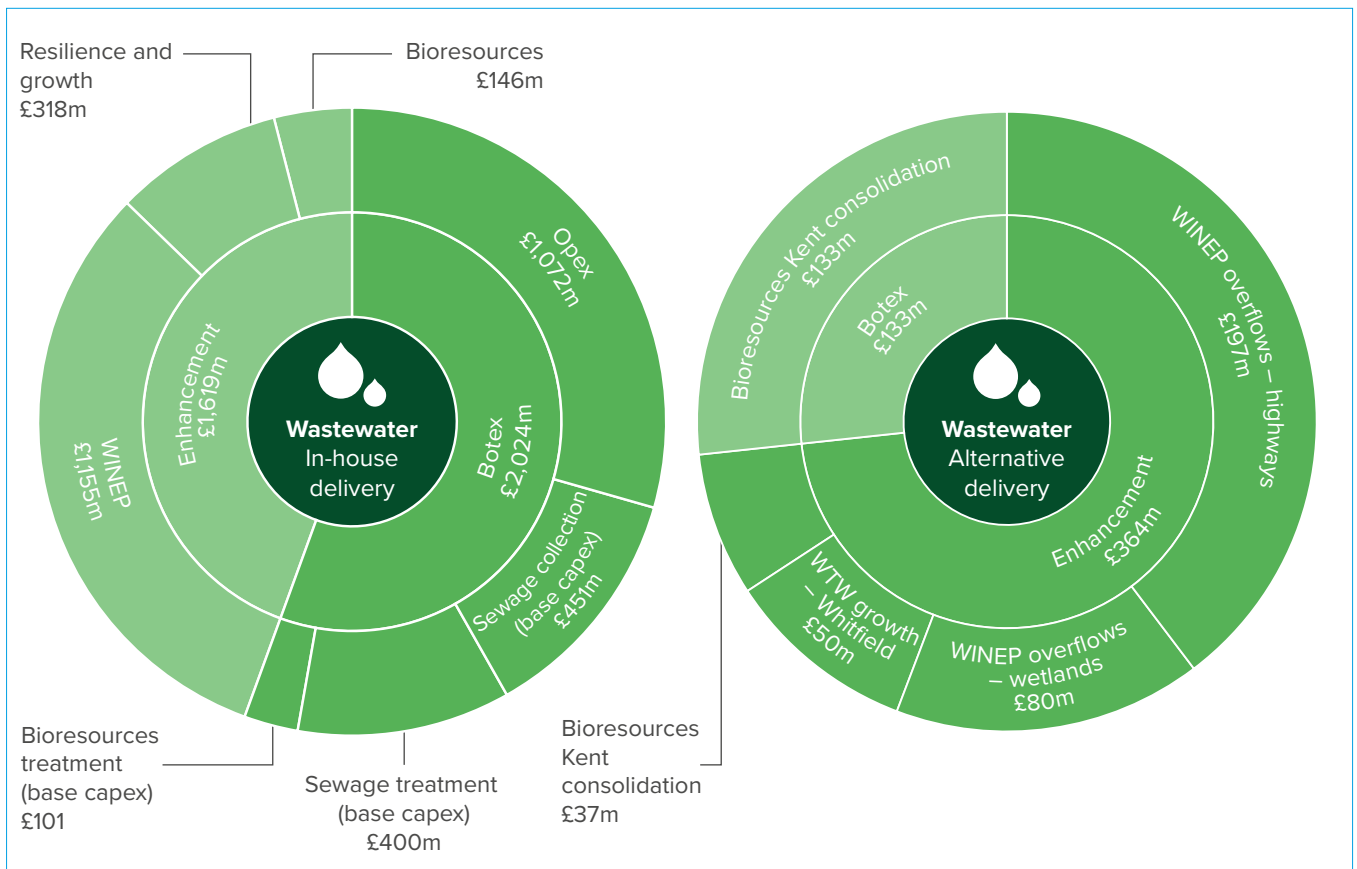


Figure 3: Our AMP8 wastewater plan

Overall, we plan to invest £4.1 billion our wastewater services between 2025 and 2030, including £497m being delivered through an alternative delivery mechanism<sup>32</sup>. We will spend:

- £2 billion to maintain our services, including paying our staff and contractors – known as **Botex**<sup>33</sup>
- £1.6 billion to enhance our services to meet current and future challenges – called **Enhancement**
- £497 million of investment through an alternative delivery route (not included in data tables CWW3 or CWW1)

Botex means “base expenditure”. This funds everything we need to do to maintain services at the same level or make slight, more gradual improvements. See section 6.4.3 for our Botex plan.

Enhancement spending is everything we need to do to make big changes to the services we provide. This includes making them much more resilient to climate change, changing how our systems work and building new wastewater treatment works. See section 6.4.4 for our enhancement plans.

#### 6.4.2. What we will deliver for customers and the environment

We measure how we are doing using performance commitments. Performing better than our targets can lead to financial rewards, but we can incur penalties if we fall short. Some of these are continuing from our current Business Plan, but some are new for our plan for 2025 to 2030. We are not proposing any bespoke wastewater performance commitments<sup>34</sup>.

Table 3: Our core performance commitments

Performance commitment	2020/21 baseline	2024/25 target	2029/30 target	Long-term target
Sewer collapses	315	250	230	230
Discharge permit compliance	97.1%	99.1%	99.1%	100%
Serious pollution incidents	4	2	0	0
Total pollution incidents	406	193	63	0
Internal flooding	393	274	240	172
External flooding	4,409	3,525	3,011	1,000

Improving our pollution performance to protect our environment is the highest priority improvement for our customers and communities. We have set an ambitious target of 63 incidents per year – which would put us in the upper quartile of the industry. This is a 67% improvement from our 2024/25 target. We know this is challenging, based on current performance, so we are prioritising addressing the root causes of problems through our Pollution Incident Reduction Plans.

Internal flooding is one of the most damaging impacts of failure for our customers. We have a low number of customers affected by repeated flooding incidents, but we will continue improving performance to protect customers. This represents a 12% improvement from our 2024/25 target of 274.

We have reduced the amount of external flooding incidents by 20% during AMP7. Customers want us to continue improving in this area, but it is a lower priority for them. This is reflected in our target which would deliver a 15% improvement between 2025 and 2030.

We have made big improvements to our wastewater permit compliance and are on track to meet our target of 99.1% compliance by 2024/25. Our target AMP8 target is to maintain this. Tighter permits and a significant WINEP construction programme make this a challenging target.

Table 3 sets out the core, common performance commitments and are continuing from our current plan. These core levels of service are funded through ‘botex’ or base levels of expenditure. Our plans for achieving these targets are in SRN19: Botex technical annex.

32 See [SRN17: Direct Procurement for Customers and Alternative Delivery Model technical annex](#)

33 Refer to CWW1a – 2022/23 price base and excludes RPE

34 Our performance targets and described more fully in [SRN18: Performance Commitment Methodologies technical annex](#)

Our other commitments will be delivered through enhancement spend. This is where we need new ways of working or capacity to meet our customers' expectations or legal requirements and permits.

Our customers and communities want us to significantly reduce our use of stormwater overflows – and pushed us to be more ambitious<sup>35</sup>. Between 2025 and 2030 we will reduce spills by a further 12% across all 978 overflows, benefiting shellfish waters and bathing waters. We have already started work on this by bringing £35 million of investment forward into AMP7 as part of the accelerated plan agreed with Ofwat.

Our WINEP addresses new targets for river water quality to improve our environment. This includes removing more nutrients, like phosphorus and nitrogen, and chemicals from our treated wastewater. We will also work with local stakeholders and partners to prevent and reduce pollution at source – finding nature-based solutions to deliver the environmental benefits our communities want.

Table 4 sets out the levels of performance that are either new for AMP8 or are funded from our enhancement plans. The methodology we used to develop our targets and commitments is outlined in chapter SRN04: Costs and Outcomes Approach.

Table 4: Our enhancement performance commitments

Performance commitment / area	2020 baseline	2024/25 target	End of AMP8 target	Long-term
River water quality	0%	34.6%	58.5%	80.0%
Bathing water quality	89.4%	87.1%	88.3%	100.0%
Storm overflows	29.7	21.0	18.45	5.9
Serious pollution incidents	4	2	0	0
Operational greenhouse gas emissions (CO2e)	152,111	152,867	159,727	0
Biodiversity – BDU net change	n/a	n/a	0	85.7

35 See [SRN03 Customer Acceptability](#)

### 6.4.3. Our Botex plan

Our Botex plan for wastewater comes to £2.02 billion<sup>36</sup> for 2025 to 2030. This includes everything we need to do to maintain our sites and pipe network, as well as making gradual improvements to things like sewer flooding and connecting new developments. It also includes our operating costs.

Table 5: AMP8 expenditure

Expenditure category	AMP8
Sewage Collection	£451.1 million
Sewage Treatment	£400.1 million
Bioresources	£101.4 million
Opex	£1,071.9 million
<b>Total</b>	<b>£2,186 million</b>

The cost of running all our support functions is also funded through Botex in both water and wastewater. This includes things like HR, IT and the cost of running our offices. The costs for these functions are split proportionally between water and wastewater. More information is available in SRN19: Botex technical annex.

The table below shows how this is broken down by the different activities we will do.

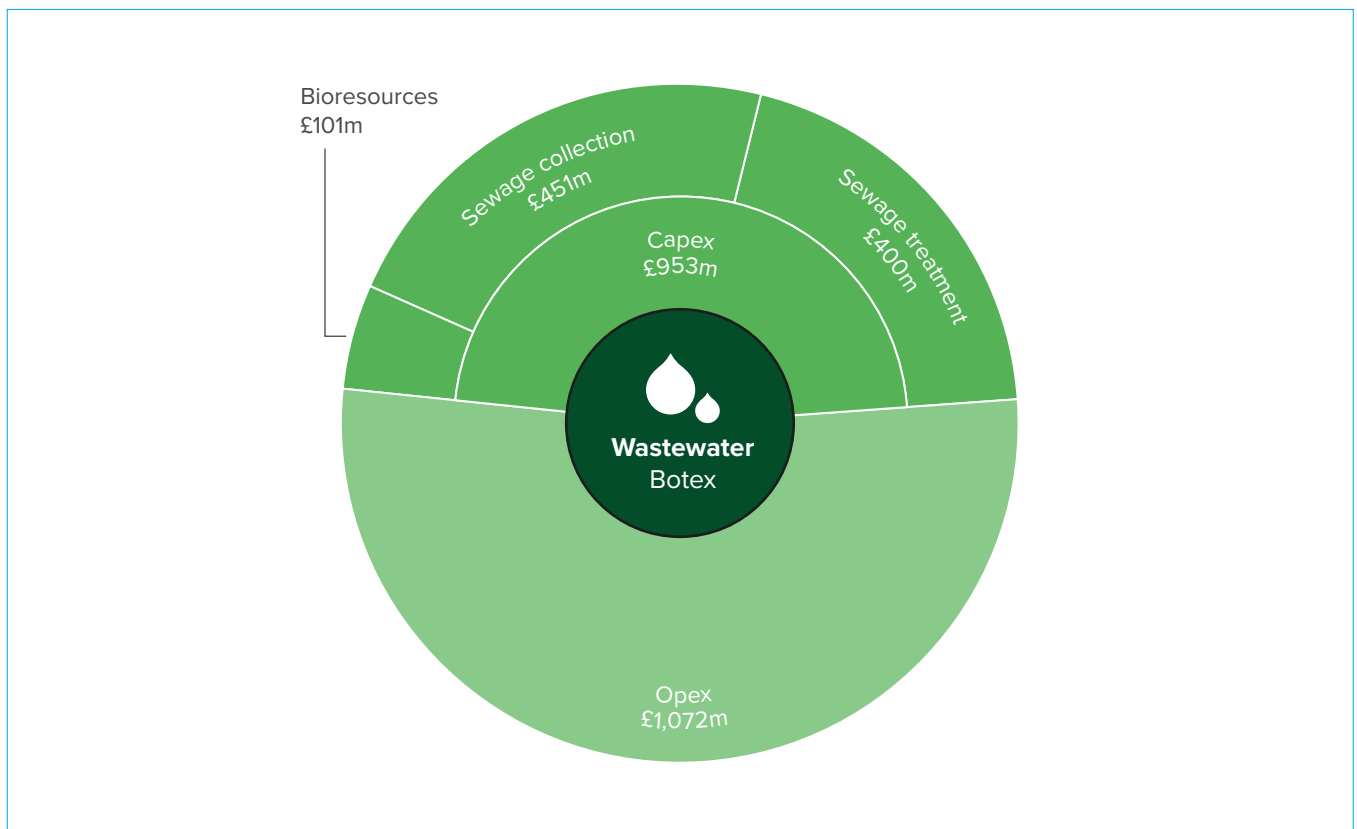


Figure 4: Our Botex plan

In addition, we will deliver a further £132.7m through an alternative delivery route. This is to deliver major schemes to consolidate our Kent bioresources operation into 2 sites.

Since 2020, we have focussed on addressing legacy issues, improving performance and transforming how we work. We are making significant progress and our spending on capital maintenance and operating costs has been higher than the regulatory funding allowances, with additional financing through our new shareholders.

36 Based on CWW1a – 2022/23 prices and exclude RPE

Our plans for AMP8 continue at a higher rate as we continue our transformation and start to address our aging asset base. Although asset age alone is not the only factor to determine appropriate replacement rates, the current level of asset replacement across the industry indicates a growing issue. This has been raised by the National Infrastructure Commission<sup>37</sup>.

Our capital maintenance proposals for 2025 to 2030 are in line with regulatory allowances, once cost adjustment claims and alternative delivery routes are taken into account<sup>38</sup>.

Our asset health monitoring and maintenance strategy programmes are designed to drive continuous improvement to the reliability of our asset base by carrying out comprehensive assessments of our assets including age, performance and failure trends. This information is overlaid with other data including criticality and location. This will improve efficiency, ensure we address highest risks first and start to move us to more sustainable levels of infrastructure investment.

Looking further forward, we will need to build resilience into all our assets – meaning like for like replacements may not be adequate for our changing climate. For example, design standards will need to reflect changing climate such as increasing heat.

We know we need to become more efficient and have included a 1% per year efficiency stretch, reducing our proposed costs by an additional 1% every year for AMP8. The urgency of improvements has been prioritised over efficiency in the last few years but the transition to a more planned, forward-looking approach is expected to move us to this more efficient cost basis.

#### 6.4.3.1. Sewage collection

We are making good progress to improve pollution and flooding performance, driven through our PIRP (see section 6.2.3 above). Compared to a 2020 baseline, we are forecasting for the current year:

- 43% reduction in pollution incidents
- 7% reduction in internal flooding
- 16% reduction in external flooding

These improvements have been mostly driven by improved operational processes, targeted investment and the 24,000 sewer level monitors we recently installed.

Our sewage collection strategy for 2025 to 2030 builds on our current approach by:

- Wider development of our smart network with strong data, modelling and analytics to identify and address risks proactively and using smart data to better target routine maintenance
- Moving from a time-based maintenance approach to fully implementing reliability centred maintenance on our 3,499 pumping stations
- Increasing the amount of sewer and rising main refurbishment to reduce the number of collapses, focussing on the highest risk mains
- Working closely with planning authorities and developers to support growth with additional capacity where required.

We are proposing to invest £451 million on our sewerage system assets to improve performance and efficiency. We need to move to more sustainable levels of refurbishment to address an ageing asset base and build greater resilience to more extreme weather. Our investment is in line with our current programme but our more proactive, data led approach means we will deliver better value for customers – doing more for the same money.

We have included £25 million to continue our annual Pollution Incident Reduction Plans to reduce pollutions and complete any outstanding remediation work to address network flow compliance risks.

#### 6.4.3.2. Sewage treatment

We have improved our wastewater compliance performance since 2020, but still have work to do to meet higher standards and build greater resilience for adverse weather.

Since 2020 we have focussed on upskilling our people, increasing the availability of equipment and improving our control of the treatment processes. The introduction of tighter environmental permits, such as new phosphorous limits, has required a step-change in our operational and maintenance processes.

We have continued addressing legacy flow compliance issues through our Environment+ programme. We have introduced new processes and governance to monitor, report and act on flow compliance risks. We identified 39 sites which required more significant enhancement to meet required flow rates with an additional investment of £25 million. Addressing these issues has been funded through additional shareholder investment.

37 NIC letter to Ofwat

38 For example, bioresources Advanced Digestion has a Cost Adjustment Claim and is being delivered through an alternative delivery mechanism with some costs in table SUPP12 rather than CWW3



Between 2025 and 2030 For AMP8, we are planning to maintain investment in this area – improving performance and compliance while enhancing our services through our WINEP (see section 6.4.5). We will:

- Maintain our focus on flow compliance, ensuring we meet all environmental permit requirements
- Increase the level of planned operational and capital maintenance, reducing the need for reactive work – supporting our 1% year on year efficiency stretch and maintaining good levels of plant availability
- Continue developing a stronger data and analytical capability, completing the rollout of new asset maintenance systems. This is essential to support a significant step change in environmental permit requirements to be delivered through our WINEP

Our WINEP requires enhanced operations at 130 sites, 40% of all treatment works. For this reason, our discharge permit compliance target is set to be maintained at over 99%. This is challenging as treatment processes must continue during this major building phase.

Population growth means we need to provide additional treatment capacity at our treatment works. Overall, additional capacity is required at 38 wastewater treatment works. An enhancement business case is included as part of our plan, explained in (see section 6.4.6.2 below).

### 6.4.3.3. Bioresources treatment

We process around 111,000 tonnes of bioresources at 16 Sludge Treatment Centres (STC) every year<sup>39</sup>. Many of these sites are ageing so need to be updated to cope with more growth and climate change, reduce our emissions and meet new standards.

Our plan for our Bioresources Botex programme is to capitalise on the work we have carried out since 2020 and fully align our base programme to our strategic objectives as described in SRN36: Bioresources Strategy technical annex.

Between 2025 and 2030 we will:

- Increase our digester cleaning and maintenance programme to achieve our target of all our 43 digesters being inspected on a 10-year cycle. This ensures effective operation, restores resilience and improves compliance.
- Replace assets based on their age and performance, focusing on dewatering and thickening assets and storage of liquid sludge and associated biogas assets such as flare stacks and gas bags

- Build two new advanced treatment processes in Kent through the cost adjustment claim (see section 6.4.3.4.1). Delivery is planned for 2031, meaning we must maintain our 7 existing Kent sludge treatment centres until 2030.

We started transitioning to Advanced Anaerobic Digestion (AAD) in AMP7, by converting our Goddards Green site in Sussex. Our long-term strategy is to fully transition to AAD and between 2025 and 2030 we will focus in Kent by consolidating our existing 7 STCs into two AAD sites.

Investing in AAD will mitigate the short-term challenges we face from changes to rules about how bioresources are used which could impact our ability to dispose of them. AAD improves the product quality for agriculture, increases renewable generation and ensures our operation is more resilient. Combining AAD with better renewable energy technologies will increase our resilience and allow us to invest in better technologies and processes, like bio-hydrogen and Advanced Thermal Conversion, when they become available. (See section 6.4.3.4.1 below.)

**88% of farmers told us biosolids feature in their long-term plans.**

*“I think it is a good thing, making better use of what is probably, technically a waste product. Hopefully over the course of the expected 15-year timescale, technology will also improve/adapt to assist.”*

**Household Customer, Water Futures Panel**

### 6.4.3.4. Cost Adjustment Claims

As part of the Business Plan process, Ofwat models the average costs it expects companies will incur to run their operations. However, each company faces unique challenges that mean their costs might be higher than average. Companies can submit Cost Adjustment Claims (CACs) to increase the allowances they receive to run day-to-day operations and meet their unique challenges.

We have submitted three wastewater-specific CACs totalling £276.2 million<sup>40</sup> to meet exceptional housing growth, change how we treat bioresources and manage the increased challenge of working in a coastal area.

39 Latest OCF (2022/2023) states 111,000 TDS/y.

40 Sum of cost adjust claim figures below

#### 6.4.3.4.1. Cost Adjustment Claim – bioresources advanced anaerobic digestion (SRN21: Advanced digestion Cost Adjustment Claim)

Treating and safely recycling sewage sludge – known as bioresources – is usually funded through Botex. New rules for how farmers use this means we need to invest significantly more than usual in new ways to treat and safely dispose of bioresources in order to meet these new regulatory requirements.

Currently, all the sludge we produce is recycled to agricultural land as a cost-effective fertiliser. New Farming Rules for Water mean farmers' ability to use bioresources is limited, reducing demand for it from us.

We have submitted a CAC to increase our Botex by £112.8 million<sup>41</sup> to enable us to convert two Sludge Treatment Centres (STCs) from conventional processes to Advanced Anaerobic Digestion (AAD). Delivery of the new AAD sites is planned for 2031, meaning we need to run the current operational sites in parallel to construction of the new sites for the duration of AMP8. These schemes will be delivered through an alternative delivery route<sup>42</sup>.

The advanced treatment processes will improve the quality of our bioresources, make it easier to store and reduce its potential environmental impact – making it more acceptable to farmers in line with the Farming Rule for Water.

#### 6.4.3.4.2. Cost Adjustment Claim – coastal population (SRN20: Coastal population Cost Adjustment Claim)

More than 40%<sup>43</sup> of our customers live in coastal communities – higher than all other wastewater companies, and above the industry average of 20%.

Having such a high concentration of customers in coastal areas presents significant challenges for our wastewater networks, including:

- Ofwat's models for inland waters take account of tight permits for some pollutants but do not take account of tight permits that apply to coastal areas, with UV treatment being a significant factor
- Increased maintenance costs because of the saline environment
- Space constraints make it harder to expand our networks and treatment works to meet demand and mean we need to invest more to control odours

- Needing to “double pump” wastewater – pumping wastewater inland to a larger treatment works to be treated before pumping it back to coastal areas and out through outfalls
- Making sure our networks can cope with increased demand during busy tourist seasons.

These all increase our day-to-day costs compared to other wastewater companies. We have submitted a cost adjustment claim to increase our Botex by £65.5 million<sup>44</sup> to take account of the higher costs incurred by coastal areas.

#### 6.4.3.4.3. Cost Adjustment Claim – wastewater growth (SRN22: Network and wastewater treatment works growth Cost Adjustment Claim)

Ofwat allows companies to invest to support historical average levels of growth. However, the Office for National Statistics forecasts much higher levels of growth in our region in the future. We are predicting the highest level of growth in the industry<sup>45</sup>.

We need to make sure our sewer networks, pumping stations and wastewater treatment works have the capacity and capabilities to support this.

This includes:

- Increasing the capacity of our sewer network to meet new growth
- Building a new wastewater treatment works to support new housing at Whitfield in Kent
- Introducing a new treatment process at our Sellindge Wastewater Treatment Works (WTW) to provide services to a new garden town at Otterpool Park in Kent
- Introducing a new treatment process at our Thornam WTW to meet demands from new housing and protect water quality in Chichester Harbour
- Supporting entirely new communities, such as Ebbsfleet Garden City, Fawley Waterside Village and Welbourne Village

We are asking for our Botex allowance to increase by £97.9 million<sup>46</sup> to meet these above average demands and ensure we enable new housing growth in our region.

41 [SRN21: Advanced digestion Cost Adjustment Claim – table 1](#)

42 This is explained in [SRN17: Direct Procurement for Customers and Alternative Delivery technical annex](#)

43 [SRN20: Coastal population Cost Adjustment Claim](#)

44 [SRN20: Coastal population Cost Adjustment Claim – summary table](#)

45 0.85% vs 0.63% – [SRN22: Network and wastewater treatment works growth Cost Adjustment Claim – Executive Summary](#)

46 [SRN22: Network and wastewater treatment works growth Cost Adjustment Claim – table 1](#)

### 6.4.4. Our enhancement plans

#### 6.4.4.1. Summary

Overall, we will invest £2 billion to enhance our wastewater services by investing £1.6 billion in our networks and wastewater treatment works through in-house delivery routes and a further £364m through an alternative delivery route<sup>47</sup>.

Our in-house delivery plan includes £1.2 billion WINEP programme – which is our the largest ever environmental investment in a single five-year investment period we have made. We developed this programme by working with the Environment Agency and Natural England to target investment to improve and protect important habitats and sites across our region.

Our enhancement plans also include the investment we need to make sure we can accommodate new growth, reduce emissions from our processes and increase our resilience – all to protect the environment and help our region thrive.

We will:

- Reduce our use of CSOs by 12% by working with nature and our communities to separate (or attenuate) rainwater and groundwater from entering our networks
- Improve water quality in over 1,000km of river by removing nutrients such as phosphorous and nitrogen and reducing our use of storm overflows
- Support growth with additional capacity at 38 treatment works
- Enhance our network to reduce the impact of the more extreme weather

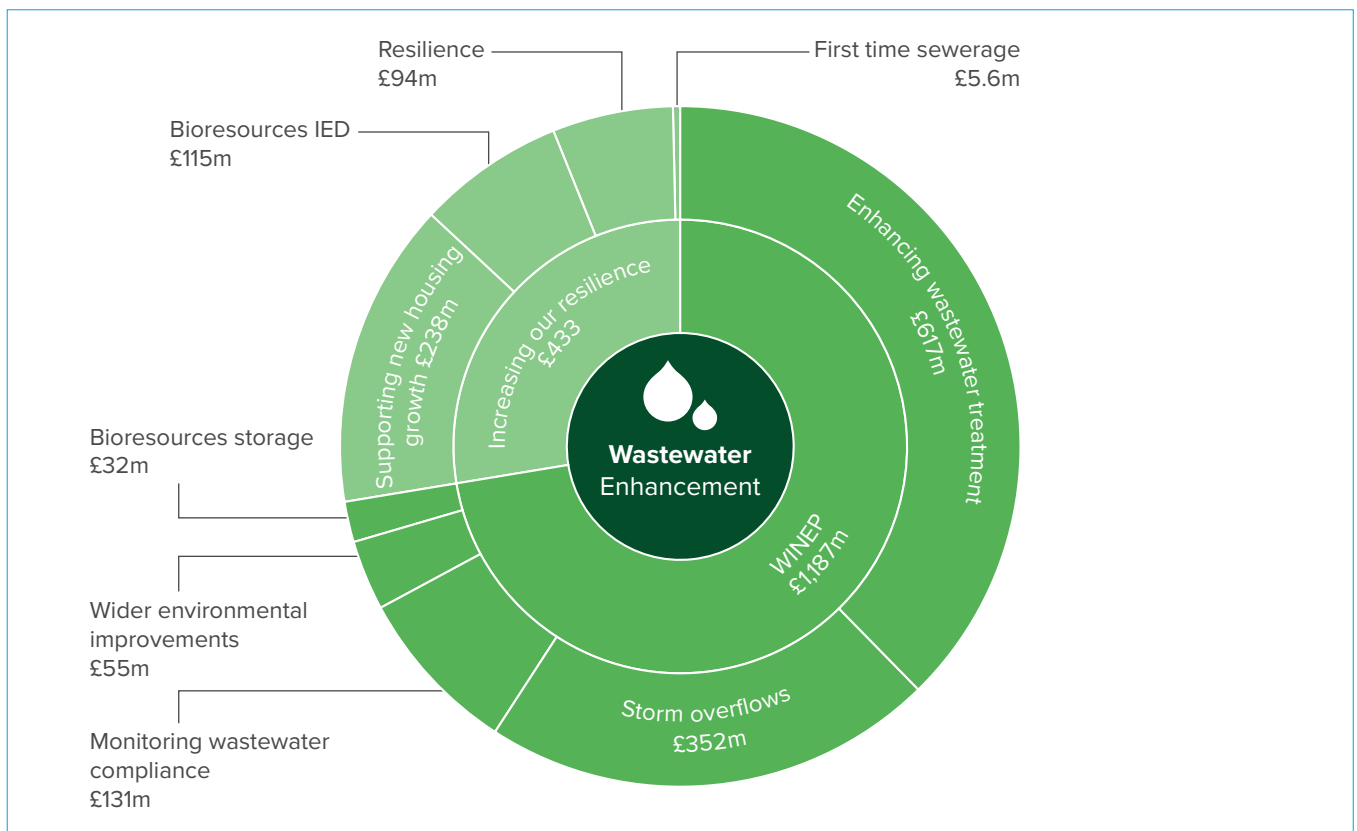


Figure 5: Our enhancement plans

The rest of this section is in two parts:

- Our WINEP
- Resilience and growth

We have summarised our enhancement cases under each section. At the end of this chapter there's a list of the source documents we have referenced.

### 6.4.5. Water Industry National Environment Programme

In 2022, our regulators set out their expectations for water companies' environmental programmes between 2025 and 2030 through the Water Industry Strategic Environmental Requirements (WISER).

47 [SRN17: Direct Procurement for Customers and Alternative Delivery Model technical annex.](#)

WISER requires water companies to develop the Water Industry National Environment Programme (WINEP), enhancing our environmental performance. Through WINEP, we will deliver the investment needed to improve and protect our environment and meet our legal obligations and government targets. As a result, much of WINEP reflects statutory requirements.

We worked with the Environment Agency and Natural England to develop our WINEP. We also engaged with a wide range of local stakeholders to understand their priorities and how we can improve our wastewater services to enhance our natural environment.

Our full PR24 WINEP programme invests £1.2 billion to protect, restore and enhance our environment. In addition, a further £277 million will be delivered through an alternative delivery mechanism<sup>48</sup>. This is the largest environmental improvement programme we have ever developed. Some of this programme has been phased to deliver after 2030.

It will enable us to make great progress towards our long-term aims of reducing discharges from storm overflows, improving water quality, protecting important habitats and coastal waters.

We will deliver around 1,200 different schemes and investigations to protect, restore and enhance the environment. Our WINEP will enable us to:

- Improve water quality by reducing phosphorus and nitrogen from almost a third of our treatment works – 96 sites
- Deliver a mix of catchment and nature-based solutions and traditional infrastructure to reduce our use of storm overflows
- Install additional flow monitors to improve our wastewater compliance and additional event duration monitors at emergency overflows
- Understand and start developing future environmental improvement programmes
- Invest in new storage for our treated biosolids to improve our resilience



Figure 6: Our WINEP 2025–30

The scale of investment in our WINEP during AMP8 is:

Table 6: Our WINEP investment programme

Enhancement TOTEX	£1,219 million
Enhancement OPEX	£68 million
Enhancement CAPEX	£1,150 million
Alternative delivery	£277 million

Elements of the WINEP are under consideration for DPC or other alternative funding arrangements, in particular two aspects of the storm overflow discharge reduction plan: wetlands for treatment of dilute wastewater and highways drainage solutions.

#### 6.4.5.1. WINEP phasing

Our WINEP is our biggest environmental programme and will deliver the step change our customers, communities and regulators expect. Delivering a programme of this scale and complexity raises issues of both affordability for our customers but also deliverability. The overall impact of this investment on bills would be unacceptable to our customers. Delivering this scale of programme over five years becomes unrealistic for both us and our supply chain.

We are committed to making the improvements but need longer to deliver them over a longer timeframe than the five-year regulatory period. This will enable us to smooth the impact on bills and enable our supply chain to increase capacity to deliver the scale of work required across the country.

The WINEP we are presenting phases targeted investment after 2030 to allow for a deliverable and affordable plan. To be compliant with its regulatory outcomes, we have phased delivery of our programme over eight years instead of five years, with lower benefit schemes being completed after 2030.

*93% of our customers preferred a proposed plan going further on storm overflows, phasing nutrient removal (to focus on high areas first) and improving resilience & sewer infiltration.*

#### Environmental Ambition Research

Our customers support us phasing some investment to balance bills and their most important environmental improvements<sup>49</sup>. This means we can bring forward improvements to an additional 20 coastal storm overflows and make the most of nature-based solutions before resorting to traditional solutions to meet the target date of 2035.

The method we used to prioritise which investments to phase is in the relevant enhancement business cases but is broadly based on:

- Delivering nature-based solutions to reduce our use of storm overflows and phasing our use of traditional infrastructure. This means we can address 20 additional overflows between 2025 and 2030 and better understand the size of storm tanks we need in the future
- Prioritising work on overflows spilling more than 10 times per year into shellfish waters, and phasing work on overflows with no spills or fewer than 10 spills that release discharge into the same shellfish waters to better understand their needs and benefits
- Delivering nutrient reduction schemes that deliver the biggest improvements first, particularly where they impact sensitive habitats, and rephasing lower-benefit schemes to after 2030
- Enhancing treatment processes in Hampshire that will mitigate Nutrient Neutrality challenges and unlock development, and phasing work to after 2030 in areas with lower growth forecast. This enables us to promote catchment and nature-based solutions to reduce nutrients

Our proposed WINEP investment is close to requiring the total five-year AMP7 level of investment every year of the AMP8 period. We continue to work with the EA, alongside Defra and OfWAT, to find sustainable ways to deliver these programmes in a timeframe that is deliverable, having regard to the existing supply chain constraints and can be afforded by our customers. Without the proposed re-phasing the plan is neither affordable nor deliverable<sup>50</sup>. Our ability to comply with our statutory obligations is conditional on regulatory acceptance of our proposed phasing.

We propose to accommodate any differences between our business plan submission and the final agreed phasing proposals in our response to the draft determination.

We have included a mechanism for managing the uncertainty of our regulators' decision on phasing in the plan. This is described in more detail in chapter [SRN10: Risk and Return](#).

The following sections explain the different enhancement cases for our WINEP included in this business plan. For more about how we will deliver our plan, see chapter SRN09: Deliverability.

49 SRN03 Customer Acceptability, section 3.2.5.2: Environmental ambition

50 Uncertainties are outlined in SRN11: Data and Assurance

#### 6.4.5.2. WINEP – storm overflows (SRN40: WINEP – Storm overflows enhancement business case)

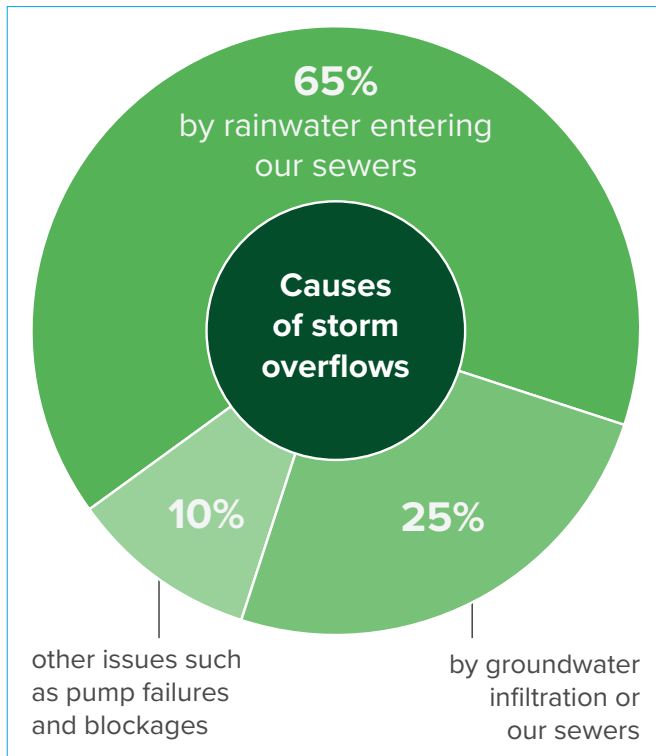


Figure 7: Causes of storm overflows

Most of our sewers are combined, which means they hold both sewage and rainwater. Our [DWMP](#) highlighted up to 95% of the water in combined sewers during a storm is rainwater.

Stormwater overflows are part of the sewer system and prevent flooding during heavy rain by automatically releasing excess stormwater into a river, stream, estuary or the sea.

Climate change means we are experiencing more extremes of weather, including intense rainfall, which can quickly overwhelm our sewers. This is made worse by urbanisation as more rainwater runs off roads and driveways into sewers, rather than naturally draining away. This means our sewers become full of rainwater, causing them to discharge through storm overflows to prevent our customers' homes and businesses from being flooded.

Government's Storm Overflows Discharge Reduction Plan and the [Environmental Improvement Plan](#) requires water companies to:

- Protect public health by reducing discharges from storm overflows into designated bathing waters and 75% of our most sensitive and protected habitats by 2035
- Eliminate all adverse ecological impact from storm overflows by 2050
- Ensure all storm overflows discharge less than an average of 10 times per year by 2050

Over 25 years, we will spend nearly £2.95 billion to significantly reduce discharges from storm overflows. Our preferred plan is to invest £698 million<sup>51</sup> between 2024 and 2030. We will improve 179 storm overflows and reduce the average annual spills per overflow to 15.5. We are proposing to phase delivery over 7 to 8 years, enabling us to accelerate additional improvements on coastal overflows.

We have focused and prioritised investment in storm overflows to meet the Defra targets and EA WINEP guidance, but also to respond to our customers priorities to reduce spills into the sea and to address the highest spilling storm overflows. Our phased plan brings forward 20 coastal overflows into AMP8 and we will improve the top 30 highest spilling overflows between 2025 and 2030. These are within the overall total of 179 overflows for AMP8.

We will reduce the number of spills at these locations to no more than an average of 10 per year by 2035, and achieve an overall average spills target of 15.5 by 2030 and 10.9 by 2035. Phasing our storm overflows enables us to focus on tackling the issues at source, through catchment and nature-based solutions, including Sustainable Drainage Systems (SuDS), and work with partner organisations to improve the management of rainwater and build climate resilience in communities.

Our aim is to separate as much rainwater from our networks as possible. Storage tanks will still be needed, but these can be sized once we have achieved as much as possible through green infrastructure.

Focussing on nature-based solutions means our preferred option is up to £76 million more expensive than our least cost option. Both plans deliver the same amount of wetland and the same length of sewer relined.

However, our preferred plan delivers significantly more benefits such as new green spaces in our communities, better adaptation to climate change, lower long-term operating costs and new opportunities for partnerships. It also relies on around 25% less buried storage than our least cost plan.

51 Includes scheme delivered through the alternative delivery mechanism and overflow investigations

We will plant more than 20,000 more trees through our preferred plan and increase biodiversity, and manage rainwater on more than 600km of roads using sustainable drainage systems – compared to just 13km in our least cost plan.

Our customers told us to use nature-based solutions first, wherever we can, and to prioritise environmental benefits<sup>52</sup>. In addition to reducing spills, this approach will provide much better resilience to extreme rainfall events.

*"I'm happy with the nature-based solutions. Maybe double the efforts on those because I don't really like the idea of the big concrete tanks. I think they're not a long-term solution. Because concrete does degrade. And then it's difficult to get rid of."*

**Household customer**

### Lavant wetland improves water quality and reduces impacts from storm overflows

A brand new wetland scheme at our Lavant WTW in West Sussex is reducing impacts of storm overflows on Chichester Harbour and improving water quality.

The project, involving the planting of more than 1,500 reed plants, has been completed as a Pathfinder project within our Clean Rivers and Sea Programme.

Lavant and the Chichester area is particularly impacted by high levels of groundwater overloading both private and public sewer. The increased pressure results in storm overflows, where releases are made into the environment to prevent flooding homes and communities.

Wetlands provide a natural solution by remove contaminants from wastewater like nitrates and phosphates, and can also improve local biodiversity as well as having absorbing and storing carbon.

The new investment in this area will also involve sealing private and public sewers helping to prevent pressurised groundwater infiltrating the system.

### 6.4.5.3 WINEP – enhancing wastewater treatment (SRN39: WINEP – Enhancing wastewater treatment enhancement business case)

We operate 363 wastewater treatment works across our region. These works recycle wastewater by removing solid waste, microorganisms and nutrients to standards set by the EA before the treated water is returned to the environment.

The wastewater contains ammonia and nutrients such as phosphorus and nitrogen, that come from food, cleaning products and agricultural runoff. All of these can affect water quality. Biochemical Oxygen Demand (BOD) and ammonia levels in treated wastewater can also impact on species living in our rivers and streams.

We need to enhance how we treat and recycle wastewater to meet new, tougher targets set out in the Environment Act, the Water Framework Directive, Nutrient Neutrality and Nutrient Neutrality Regulations.

We need to meet new, tighter permits at more than 130 of our treatment works for a range of different nutrients, chemicals and water quality standards.

The Environment Act sets a target to reduce phosphorous in treated wastewater by 80% by 2038. This means we can phase this investment after 2030 to meet the target while and still reducing phosphorus levels by 58.5% by 2030. We remain on target to meet the Environment Act target by 2038.

Our WINEP includes an extensive and varied improvement programme at our treatment works: based on our investigations, water quality modelling showing where our sites might be impacting the environment and our DWMP which identifies long-term investments to protect and improve our environment.

We will use nature-based solutions, like wetlands and reed beds, wherever we can to improve the quality of water we return to the environment. However, most of the schemes to reduce nutrient levels involve adding new treatment facilities at our wastewater treatment works.

The need for us to meet new tighter standards and the highest technically achievable limits (TAL) of wastewater treatment, set out in the permits we receive from the Environment Agency, means the level and certainty of treatment cannot be achieved through nature-based solutions. We will also install UV disinfection to protect shellfish water quality from microbiological contamination.

We have reviewed local authority growth plans to identify where development is slowed due to nutrient neutrality requirements. We will prioritise investment in these wastewater systems to help unlock this development – focussing on high-growth areas and phasing others to after 2030.

As part of WINEP, we need to better understand and reduce the presence of chemicals and other substances in the environment. We are proposing a number of improvements to better remove chemicals or prevent them entering waterbodies.

Reducing the presence of cypermethrin is the biggest driver of investment in this part of WINEP. We also have new permits for zinc, copper, cadmium and other chemicals. These levels are driven by the Water Framework Directive.

We will install final effluent disinfection at five treatment works to help meet new standards required for shellfish waters. We are phasing other treatment works improvements which would contribute to further improving bathing waters until after 2030 as we test alternative nature best solutions.

We are phasing some parts of this until after 2030 – prioritising our customers’ highest priorities and ensuring our plans are affordable and deliverable.

#### **6.4.5.4 WINEP – monitoring wastewater compliance (SRN41: WINEP – Monitoring enhancement business case)**

Since 2015, we will have installed Event Duration Monitors (EDMs) across all our 978 storm overflows by December 2023, with coverage currently at 98.6%. These measure number and duration of spills. This is in addition to flow measurement at all our wastewater treatment works where required in their permits.

These programmes have given us a much better understanding of how our network is performing during dry weather and storms. We created our Clean Rivers and Seas Taskforce and programme to deliver our storm overflow improvement plans.

We want to enhance our monitoring capabilities even more – installing 669 more monitors across our region to record wastewater flows and improve our understanding of the quality of water in our environment. These are to cover emergency overflows and upgrade existing equipment to meet new standards.

We will be able to share more information about the condition of our environment, more accurately report how and why spills occur and target our improvement plans in the future following these enhancements.

#### **6.4.5.5 WINEP – wider environmental improvements and gaining understanding (SRN42: WINEP – Wider Environmental Enhancement enhancement business case)**

Investment in this area will help us understand where we will need to make improvements in the future and how best to make them. It also includes trialling innovative approaches and other environmental improvements that

do not sit under other business cases.

This programme includes over 360 investigations into the different impacts of our works on the environment, how we can better protect wildlife, reducing storm overflows and the impact of microplastics. We also have 24 investigations to deliver as our part of the UK water industry’s Chemical Investigations Programme

#### **6.4.5.6 WINEP – bioresources cake storage (SRN43: Bioresources cake storage enhancement business case)**

We produce around 111,000 tonnes of sludge each year from treating wastewater<sup>53</sup>. This is called bioresources and, once treated, is a popular, cost-effective fertiliser because of its high nutrient content. We also use the biogas it produces during treatment, to generate renewable energy.

We need to adapt how we treat, store and recycle sludge because:

- Our assets are ageing and some aren’t fit for the future
- Enacting the Farming Rules for Water will mean farmers are more restricted in how they use our bioresources as a fertiliser
- The Environment Agency’s Sustainable Sludge Strategy is also changing how bioresources can be stored and recycled to agricultural land

Improving the quality of bioresources, and how we store them, reduces the risk of run off into rivers from our sites and farms – helping protect water quality. Improving how we store bioresources also ensures they’re available when it is most needed, and we are less likely to rely on less sustainable solutions, such as incineration, when they’re not. Our WINEP includes £32 million to improve how we store and recycle bioresources.

#### **6.4.6. Resilience and growth**

We need to invest in additional capacity and new capabilities to protect our environment from other challenges outside of our WINEP. This includes increasing our ability to support new growth and our resilience against the more extreme weather we are experiencing.

This section includes investment that will give us new treatment capabilities and capacity, including building a new treatment works, or meet new design standards.

53 Latest OCF (2022/2023) states 111,000 TDS/y.



### 6.4.6.1. Operational resilience

We have identified six major challenges we must address to improve our operational resilience and protect our environment. They are:

- Population growth and demand pressures
- Climate Change
- Drought
- Ageing assets
- Cyber security
- Transition to net zero

In addition to the improvements we are making through our Botex plan (see section 6.4.3 above) we will invest £94 million to protect our assets against the challenges we face.

Specifically between 2025 and 2030 we will deliver the following programmes:

- **Coastal erosion resilience** – investing at three sites to protect them from the increasing levels of risk posed by coastal erosion impacts due to rising sea levels. We are working in partnership with the Environment Agency, supporting delivery of key schemes where they provide benefits for Southern Water customers
- **Power resilience** – enhancing key wastewater sites to be more resilient to the impacts of power supply interruptions through increasing levels of redundancy and resistance in our power infrastructure
- **Groundwater infiltration resilience** – building resistance into our sewerage network through delivering sewer watertightness measures to reduce the amount of water that infiltrates our sewers
- **Flooding resilience** – investing in flood defence measures to protect six key wastewater sites to reduce the exposure to flooding events caused by increasingly frequent and severe rainfall
- **Heat stress resilience** – enhancing 22 wastewater sites to ensure they are suitably ventilated and cooled to safely operate under heat stressed conditions, that are becoming more frequent due to climate change

*“If we don’t invest in these things, when this does end up causing bigger damage, the company is then going to have to spend our money anyway, to fix it. So it’s best to actually reduce the issue than just to wait for it to happen and then have to pay more in order to fix the damage that’s been done.”*

**[Dual Future, Hampshire] – Acceptability Testing**

### 6.4.6.2. Treatment works growth (SRN44: Wastewater treatment works growth enhancement business case)

We have a duty to support new homes while protecting our environment. We are forecasting one of the highest levels of population growth in the UK and have identified 38 wastewater treatment works where we need to increase capacity or capabilities to support this.

Customers expect us to ensure we develop the infrastructure needed to support new housing – helping our communities grow while protecting the environment for future generations. They want us to invest in long-term solutions to the challenges we face.

Historically, we have been able to support new growth through gradual improvements to our wastewater treatment works. This is no longer the case, and nine of our sites require a typical solutions.

One of these sites is a completely new treatment works for Whitfield serving a population of 18,700 people.

### 6.4.6.3. Bioresources IED (SRN37: Bioresources IED enhancement business case)

In 2022, the EA set out new guidance on how we should treat and store sewage sludge – a byproduct of wastewater treatment. We have 16 sludge treatment centres (STCs) that we need to upgrade to meet these new standards.

Part of this enhancement case were initially submitted as part of our WINEP as they reduce greenhouse gas emissions from sludge treatment and storage. However, this was rejected and now forms this enhancement case.

Due to changes in permits and guidance, the scale of the improvements we need to make has increased significantly. We need to invest £115 million between 2025 and 2030 to make sure our sites are compliant with the Industrial Emissions Directive.

Our plan includes:

- Rationalising sites to improve our compliance
- Covering storage tanks
- Building new containment facilities

The investment in [SRN21: Advanced Digestion Cost Adjustment Claim](#) will also improve our compliance with these new requirements.

### 6.4.6.4. First time sewerage (SRN45: First time sewerage (s101a) enhancement business case)

We have a legal duty to assess the most economical and practical way to provide effective drainage where environmental or amenity problems exist or are likely to arise from existing drainage system.

We plan to invest £5.6 million to connect 83 existing homes to our wastewater networks.

## 6.5. Delivering our plan

Our plan for 2025 to 2030 is twice the size of our current investment programme. We know delivering investment at this scale and pace is a challenge. We reviewed our current capabilities for delivering in core areas. We will invest further in these capabilities.

We have already taken steps through our Turnaround Plan to increase our capacity to deliver – including securing additional shareholder funding, scaling up our procurement and supply-chain capabilities and developing our plan for 2025 to 2030 using rational phasing and alternative delivery methods. This has given us confidence to plan for a significant increase in investment and delivery.

The increase of investment programmes across the water sector will lead to heightened demand on the supply chain. Addressing this requires careful coordination and collaboration to make sure there is sufficient capacity and capability, while maintaining commercial tension to drive best value.

Our plans for 2025 to 2030 include more advanced solutions and technologies, in addition to more work and specialist skills. Attracting and retaining key people, from field force to skilled environmental scientists, in a highly competitive region of the UK, adds weight to this challenge and risks which can potentially slow down pace of delivery.

Reflecting on these challenges, and drawing from best practice delivery across the sector, we have assessed our current and planned measures against four core deliverability requirements to mitigate deliverability risks.

[Chapter SRN09: Deliverability](#) has more information about the work we commissioned and how we are implementing this.

<p><b>Supply chain strategy:</b> We have established strong relationships and agreements with suppliers ahead of the next investment period and we will complete procurement of our delivery partners early in 2024.</p>	<p><b>Portfolio execution plan:</b> We developed clear plans and priorities across the portfolio, aligning planning, delivery, and other business areas to ensure efficient execution and effective resource allocation.</p>
<p><b>Portfolio delivery and performance management:</b> We are enhancing our programme management capability and capacity to track performance, implement the plans and oversee delivery.</p>	<p><b>Strategic workforce:</b> We are committed to finding, retaining, and training the right people. Strategic workforce planning will address capability gaps and ensure a skilled workforce is in place.</p>

### 6.5.1. Alternative delivery

We are proposing to maximise our use of DPC or other alternative funding routes to help reduce the affordability and deliverability concerns due to the size of the plan. Costs for these schemes are not included within the standard cost data tables (CWW1 to 3) but as part of the DPC / Alternative Delivery tables.

The following schemes are included as Alternative Delivery schemes, explained in [SRN17: Direct Procurement for Customers and Alternative Delivery Model technical annex](#).

- Two new advanced sludge treatment centres in Kent, a key part of our bioresources strategy
- The new treatment works at Whitfield required to meet the significant housing developments in the area
- Two important elements for delivery of our storm overflow discharge reduction plan: wetlands for treatment of dilute wastewater; and highways drainage solutions

### 6.5.2. Delivering obligations and plan uncertainties

We have had full regard to ensuring we continue to comply with our existing statutory and licence obligations through our business-as-usual assurance process (see chapter [SRN11: Data and Assurance](#) for an explanation of this process). New obligations are addressed through our enhancement plans.

There are a number of areas where there is material uncertainty in the parts of the business plan. Many of these uncertainties relate to legal or policy decisions that are yet to be made at the point of business plan submission. These are explained more fully within [SRN58: Uncertainty Mechanisms technical annex](#) and for wastewater include:

- We have not yet received confirmation from the EA that our proposed reprofiling of WINEP to address affordability and deliverability concerns is acceptable
- Significant uncertainty around the application and timing of Rule 1 of the Farming Rules for Water and its impact on our Bioresources operations
- Several material uncertainties around the Bioresources Industrial Emissions Directive (IED) including the acceptability of our impermeable surface option