



TMS09 Our AMP8  
Wastewater Outcomes  
Delivery Strategy

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## 1. Executive summary

This document sets out:

- Our projected performance for AMP8 and beyond for each of our wastewater service outcomes, and our proposed targets.
- The underlying reasons for our past and future performance.
- Actions we are taking to deliver improved performance.

The table below shows the Performance Commitments (PCs) included for each outcome.

*Table 1 – Wastewater AMP8 Outcomes and Performance Commitments*

Outcome	Performance Commitments
Prevent sewer flooding and take waste away safely	Internal Sewer Flooding External Sewer Flooding Sewer Collapses
Stop polluting rivers and improve their quality	Total pollutions Serious Pollutions Discharge Permit Compliance Storm Overflows Bathing Water Quality River Water Quality

For each Performance Commitment (PC) we have set stretching targets for improvement between the end of AMP7 and AMP8. This includes:

- 17% reduction in internal sewer flooding
- 30% reduction in total pollutions
- 50% reduction in serious pollutions
- 28% reduction in storm overflows
- 100% compliance with discharge permits

Our programme is designed to deliver improvements based on customer priorities and government and regulatory requirements.

With respect to the proposed ODI framework, we have proposed an alternative approach, which we believe delivers a more balanced approach to risk, whilst delivering significant performance improvements and allowing maximum allowances to be invested in both the asset base and delivering service to customers. For further details please refer to TMS41 Aligning Risk and Return.

In common with other companies, our performance is vulnerable to significant disruptions, particularly caused by weather extremes which we have taken into account within our plans. We have set stretching targets that reflect our current performance and the rate of improvement that can be achieved over AMP8 to ensure a credible and deliverable plan. It is also notable that the companies that form the upper quartile for each Performance Commitment vary from year-to-

year, which demonstrates the unlikelihood of delivering consistently high performance across all measures.

Our current performance is mixed, with performance on sewer collapses at upper quartile and total pollutions, and discharge permit compliance better than the industry average, but we have lagged the industry leaders particularly in serious pollutions, internal flooding and external flooding.

In order to improve the state of our assets and change the way we operate our shareholders have invested significant additional funding and will continue to do so. Given the scale of our assets and operations, it will take time to deliver improvements. The scale of investment needs to be affordable for customers. Targets need to be set which reflect the time it will take to deliver change. Failure to recognise this would result in excessive ODI penalties, which in turn would slow down the pace of improvements and reduce our financial resilience.

We have an extensive programme of innovation, implementing new technology, and delivering improvements in working practices. We have learnt from other companies where they are implementing change successfully. In AMP8 we have outlined the first elements of our longer term plans, with the majority of expenditure funded from base expenditure, however, we do have 4 Enhancement Cases that have been submitted as part of our wastewater price control submission:

- Increased spend to accommodate growth at 16 Sewage Treatment Works;
- Delivery of our AMP8 WINEP;
- Increased costs associated with completion of our AMP7 WINEP, including reconciliation of the PR19 uncertainty mechanism;
- Increased spend in capital maintenance to arrest deterioration associated with specific asset cohorts including rising mains and Sewage Treatment Works.

In our submission we have also made a case for increased capital maintenance to start addressing an Asset Deficit estimated at £4.90bn in a 22/23 price base (£4.15bn in 17/18 price base) across our wastewater business. It will take many years to address our aging infrastructure, but in AMP8 we will focus on addressing key areas which are specifically impacting pollutions and spills, with increased investment at our STW's, pumping station rising mains and our SCADA (Supervisory, Control and Data Acquisition) systems. The latter are critical to monitoring and controlling our key assets. Refer to Technical Appendix: TMS15 Asset Deficit for more details.

Despite the considerable additional funding that has been provided by our shareholders in AMP7, and the additional equity envisaged, funding will constrain what we can achieve in AMP8. There is also a limit on the size of the capital expenditure programme that we can practically deliver in AMP8.

We recognise will not be able to deliver the full extent of the environmental obligations and outcomes that are expected prior to 2030 and that we have needed to make a number of prioritisation-based decisions. We are open to further discussions with government and regulators regarding alternative approaches.

## 2. Outcome 1: Preventing sewer flooding and taking waste away safely

Flooding someone's home, business or garden is by far the worst service failure for customers, who see preventing sewer flooding as a top priority.

Our customers, stakeholders, regulators and Board will hold us to account through the adoption of three common Performance Commitments: Internal Sewer Flooding, External Sewer Flooding and Sewer Collapses.

- Internal sewer flooding measures the number of incidents (per 10,000 sewer connections) where material has escaped from the sewerage system and resulted in water, silt or sewage debris within a property. This measure includes flooding incidents resulting from hydraulic overloading, sewer blockages, sewer collapses and equipment failures.
- External sewer flooding measures the number of incidents (per 10,000 sewer connections) where material has escaped from the sewerage system and resulted in water, silt or sewage debris being deposited within the curtilage of a property used for residential, public, community and business purposes. This measure includes flooding incidents resulting from hydraulic overloading, sewer blockages, sewer collapses and equipment failures.
- Sewer Collapses are defined as the number of collapses (asset failure) per 1,000 km of the sewerage network, which have not been proactively identified by the water company and impact the service to customers and the environment.

By 2050, our ambition is to significantly reduce the risk of internal and external flooding caused by blockages and limit flooding to only those occasions which are as a result of the most extreme weather conditions.

The remainder of this section looks at each Performance Commitment in turn, setting out our proposed targets in the context of our current performance and providing an overview of the activity required to deliver the proposed levels of improvement.

## 2.1. Internal Sewer Flooding

### 2.1.1. Performance, targets and incentives

Our performance with regards internal sewer flooding has been inconsistent and although we have performed better than the industry average in 5 out of 7 years up to 2022, our performance has been deteriorating in recent years and we are committed to turning this trend around.

The tables below set out our actual and projected medium and long-term level of performance. Our performance in recent years (since 2020) has generally been in the lower quartile for the industry and in particular recent years has been impacted by intense summer storms in London, which has seen flooding to a large number of basement properties as our network has been overwhelmed by huge volumes of rainwater.

*Table 2 – Performance and Proposed Target (unit: incidents per 10,000 sewer connections)*

AMP	AMP6			AMP7					AMP8				
Year	17/ 18	18/ 19	19/ 20	20/ 21	21/ 22	22/ 23	23/ 24	24/ 25	25/ 26	26/ 27	27/ 28	28/ 29	29/ 30
Thames Water*	2.00	2.10	2.02	2.31	3.46	1.91	1.88	1.83	1.77	1.68	1.62	1.57	1.52
Industry Average	2.69	2.46	2.75	2.25	2.13	1.65	-	-	-	-	-	-	-
Industry Upper Quartile	1.46	1.58	1.89	1.64	1.52	1.21	-	-	-	-	-	-	-
Proposed Target	-	-	-	-	-	-	-	-	1.77	1.68	1.62	1.57	1.52

\*Actuals to 2022/23; Forecast thereafter

*Table 3 – Long term performance trajectory (unit: incidents per 10,000 sewer connections)*

	AMP6	AMP7	AMP8	AMP9	AMP10	AMP11	AMP12
End of AMP Year	2019/20	2024/25	2029/30	2034/35	2039/40	2044/45	2046/50
End of AMP target	2.02	1.83	1.52	1.30	1.10	0.80	0.40

Over the last 6 years the majority of internal sewer flooding has been caused by blockages on our network and especially in low diameter sewers (<150mm), with typically between 70-80% of incidents resulting from a blockage.

However hydraulic flooding is the most volatile component of our performance. This was demonstrated during July 2021, when two intense summer storms struck London, when there were 779 incidents of sewer flooding in just 2 days. The average number of hydraulic flooding incidents in the previous 4 years had been just 136 incidents per annum.

In the long term is to eradicate flooding except for those incidents associated with the most extreme weather events.

Table 4 – Analysis of internal sewer flooding incidents by cause

	17/18	18/19	19/20	20/21	21/22	22/23
<b>Internal Sewer Flooding Performance</b>	<b>2.00</b>	<b>2.10</b>	<b>2.02</b>	<b>2.31</b>	<b>3.46</b>	<b>1.91</b>
Incidents caused by Blockage- Fats/Oils/Greases	289	324	354	348	315	344
Incidents caused by Blockage- Rag/Paper	250	218	264	251	236	205
Incidents caused by Sewer Defect/Collapse	90	76	70	93	123	113
Incidents caused by Blockage- Debris	53	76	92	128	91	120
Incidents caused by Blockage- Roots	27	37	58	59	43	34
Incidents caused by Blockage- Third Party	74	74	71	57	60	54
Incidents caused by Blockage- Scale/Silt	28	23	31	41	28	52
<b>Total Incidents as a result of blockages</b>	<b>811</b>	<b>828</b>	<b>940</b>	<b>977</b>	<b>896</b>	<b>922</b>
Incidents caused by Operational Incidents	82	91	51	68	56	44
Incidents as a result of hydraulic flooding	87	171	127	159	980	150
Incidents where no known cause was identified	169	113	65	188	171	54
<b>Total internal sewer flooding incidents</b>	<b>1149</b>	<b>1203</b>	<b>1183</b>	<b>1392</b>	<b>2103</b>	<b>1170</b>

Our analysis highlights the importance of reducing the number of incidents that arise from a blockage on our sewerage network. Significant reductions in blockages will have a corresponding benefit on internal (and external) sewer flooding.

The July 2021 floods highlighted the urgent need for greater collaboration in managing surface water in London which led to the formation of the London Surface Water Strategic Group. This brings together all the key stakeholders, including the Mayor of London, London Boroughs, Environment Agency and ourselves, to develop and deliver a London -level strategy to manage surface water flood risk in the capital.

Section 2.1.2 describes the activities we are currently undertaking and plan to continue in AMP8.

### 2.1.2. Activity to improve performance

#### Activities included within base expenditure

The activity included in our AMP8 plan is based on reducing the number of sewer blockages and targeting those parts of our network where blockages are more likely to result in flooding. This will be achieved through both our response to incidents reported by customers, improved engagement with customers regarding how their behaviours can increase the risk of a flooding incident and the use of innovative, digital tools allowing real time monitoring of the network and interventions prior to there being any customer impact.

In AMP6 we established a dedicated investigations team which analyse all internal flooding incidents and geo-spatially map all reported incidents including root cause analysis. This allows us to target interventions based on the specific cause of incidents.

This is supported with the roll out of a digitised network which takes signals from newly installed sewer depth monitors and using machine learning start to proactively identify areas of the network that require proactive investigation. In the first 6 months alone, (Sept21 – Mar22), this

innovative approach was confirmed via a full catchment pilot in Henley on Thames which resulted in identifying 30% of blockages proactively before there was any service impact.

The interventions that span AMP7 and AMP8 include:

### **Improved Speed of Response**

We are increasing the number of resources that respond to reports of sewer blockages and they will carry the latest equipment allowing full resolution of the issue without the need for a repeat visit. Our analysis has shown that by routinely attending all blockages within an 8-hour window can reduce the risk of any sewage escaping from the network by 10-15%.

### **Acceleration of our Sewer Network Digitisation**

By the end of AMP7 we will have installed 19,500 sewer depth monitors on our network, which will increase by a further 31,000 to over 50,000 during AMP8.

These monitors will feed level signals back to a new digital platform, alongside data from our pumping stations and treatment works to proactively identify issues on the network. Due to the fact that sewer networks can demonstrate varying characteristics depending on the weather and time of year, we have adopted machine learning to understand these variations and ensure notifications are genuine.

### **Customer Education**

We aspire to reduce blockages caused by sewer misuse and will look to re-invest the additional capacity in responding to remaining blockages much faster. (Refer TMS11 Our Customer Strategy)

We have two methods for addressing sewer misuse: *education* and *enforcement*. The key activities we undertake to encourage our customers to change their behaviours in a way that prevents and reduce blockages are set out below.

#### *Education*

Our educational activities on preventing sewer blockages span from widespread publicity campaigns to community-level programmes, and to engaging with individual customers and Food Service Establishments (FSEs).

In March 2023, we joined Water UK's 'Bin the Wipe' campaign, to raise awareness of the potential for wet wipes to cause blockages when flushed. We also run our own successful campaign, 'Bin it, Don't Block it' to educate customers on the impact of disposing of Fats, Oils and Greases (FOG) and unflushable materials such as wet wipes down the drain.

Our activities in the local community span across a wide range of stakeholders and settings. This year we joined the Junior Citizenship Schemes (JCS) for Year 6 pupils run by the Met Police in conjunction with Local Authorities, to educate children on sewer misuse and unflushable materials from a young age. As part of our community educational activities, we have extended our engagement to include care homes, Guy's & St Thomas' Hospital, and His Majesty's Prisons Highdown and Downview. We also continue to work collaboratively with the other UK water companies sharing best practice and learnings at the Network Protection Forum and the Sewer Network Abuse Prevention (SNAP) group.

In terms of our engagement with households, we send written communications to inform customers on how to avoid blockages, escalating to an educational visit from a Thames Water



employee if blockages continue. We are also trialling a new approach to better target blockage hotspot areas. We continue to focus on educating customers first, but if sewer misuse continues, we may escalate to enforcement, as detailed below.

We also engage proactively with FSEs to educate them on grease management within their kitchens, and to inspect FSE kitchens to ensure that grease management equipment, such as a grease trap or grease removal unit, is installed and maintained. So far in AMP7 we have visited over 16,000 businesses with over 3,700 of those installing grease management equipment for the first time as a direct result of our engagement.

## Enforcement

In instances where our education-focused approach is not effective, we are trialling the use of our powers for enforcement under Section 111 of the Water Industry Act 1991 for both household customers and FSEs.

In the case of household customers, if blockages persist following education, we will begin investigations into the specific customers responsible. We will notify them of our investigations via letter, conduct home visits to explain the impact of behaviour that causes blockages, and make customers aware of our enforcement powers if they continue to misuse the sewers.

To address non-cooperative FSEs or FSEs that create a significant operational incident, we created a dedicated enforcement team in May 2023. Our focus is on working with FSEs to make voluntary rectifications, with a target of zero prosecutions. However, if required, we will look to exercise our enforcement powers against offending FSEs that persist in sewer misuse.

## Interceptor Removals

Within our towns and cities which have older sewerage networks, there is a propensity for interceptors to have been installed on small diameter sewers. These were prevalent in the first half of the 1900's to address shortfalls in internal plumbing standards and in essence are designed as a U-bend within a manhole.

Interceptors are no longer required, but there are an estimated 165,000 remaining on our network, with 40,500 having been removed to date. Our analysis shows that they are prone to blockages as they were never designed to cater for products such as wet wipes. When blocked, flows back up through the property's private drainage pipes restricting toilet use or causing internal and/or external flooding.

As part of our AMP8 programme we will remove a further 43,000 interceptors where we know they repeatedly block and where they could potentially result in sewer flooding.

## Virtual Blockage Alarms

A new innovation currently being trialed, linking all incoming customer contacts, with our job management system and our geospatial mapping tools to create an automated "virtual" alarm. Using algorithms this system dynamically assesses the activity in a locality, detects unusual activity from that expected in that part of the network and triggers a proactive investigation team. The concept will speed up proactive interventions and reduce the possibility of repeat incidents over time, as we predict/forecast where an underlying issue could be emerging.

## Hydraulic Flooding

We will continue our ongoing programme to address high priority properties that suffer from hydraulic flooding as part of our base expenditure.

Further as we reduce blockages and the impacts of climate change increase, hydraulic flooding will become a greater proportion of sewer flooding, potentially larger scale solutions will be required. We have therefore created a dedicated team who are working with other organisations responsible for drainage, creating partnership working and developing holistic, sustainable solutions to this challenge.

The extreme flooding in London in July 2021 demonstrated the consequences of climate change and intense rainfall on our capital. Reports revealing that London is one of the least “spongiest” cities in the world with large areas of impermeable surface means that during heavy rainfall the surface water inundates our sewer network which was never designed to accommodate such high volumes of surface water.

To upgrade large parts of the London sewerage network to accommodate the impacts of climate change would be impractical and agreement has been reached with stakeholders including the GLA and London Boroughs that a new approach to surface water management is needed for the capital. Our plan includes costs for this collaborative approach including:

- Working with the Boroughs and other partners to create and deliver a pipeline of SuDS projects to reduce the demands on our sewerage network.
- Trialling the concept of “designing for exceedance” with a London Borough.
- Updating models to reflect surface water flows as well as flows within the sewer network.
- Investing in protecting individual properties.

These programmes will be supported by our ongoing capital and operational maintenance activities including:

- Proactive cleaning of 1,500km of sewer per annum
- Undertaking 400 proactive and reactive sewer repairs per annum
- Maintenance at our pumping stations to reduce the risk of failure and hence surcharging of the system.

### Activities included within enhancement expenditure

There are no activities planned to be funded through an Enhancement Case for this performance commitment.

For clarity, investment has been included as enhancement spend within the Data Tables, as per Ofwat guidance, given allowances for the resolution of hydraulic flooding are considered Botex-plus.

## 2.2. External Sewer Flooding

### 2.2.1. Performance, targets and incentives

External sewer flooding has not previously been a performance commitment for Thames Water and hence has not been reported annually.

In preparation, we have been “shadow reporting” and upon receipt of the final AMP8 methodology from Ofwat, undertook internal reviews to ensure our shadow reporting is consistent with the new common performance commitment in AMP8.

This work concluded that we have under-stated the number of external flooding incidents which has now been corrected. Taking into account our re-stated numbers, we have been consistently below the industry average and significantly behind the upper quartile except for 22/23.

Without the same focus as other performance commitments, we will change our approach through AMP7 as we approach AMP8. We will build our insight and ensure our flooding action plans start to address external flooding incidents replicating our approach with regards internal sewer flooding.

The tables below set out our actual and projected medium and long-term level of performance. Our recent performance has generally been in the lower quartile and in the first 2 years of AMP7 we were the worst performer in the sector, which we recognise needs to change.

*Table 5 – Performance and Proposed Target (unit: incidents per 10,000 sewer connections)*

AMP	AMP6			AMP7					AMP8				
Year	17/ 18	18/ 19	19/ 20	20/ 21	21/ 22	22/ 23	23/ 24	24/ 25	25/ 26	26/ 27	27/ 28	28/ 29	29/ 30
Thames Water	23.84	21.50	28.15	37.64	28.87	18.41	27.85	27.21	25.73	24.88	24.34	23.83	23.37
Industry Average	22.1	21.42	23.17	20.76	20.11	18.80	-	-	-	-	-	-	-
Industry Upper Quartile	11.4	14.6	16.5	14.4	18.1	16.7	-	-	-	-	-	-	-
Proposed Target	-	-	-	-	-	-	-	-	25.73	24.88	24.34	23.83	23.37

*\*Actuals to 2022/23; Forecast thereafter*

The improved performance in 22/23 could be misleading, as it was largely due to the dry year we experienced in the southeast of England. Our future forecasts have been developed adopting average weather conditions.

*Table 6 – Long term performance trajectory (unit: incidents per 10,000 sewer connections)*

	AMP6	AMP7	AMP8	AMP9	AMP10	AMP11	AMP12
End of AMP Year	2019/20	2024/25	2029/30	2034/35	2039/40	2044/45	2046/50
End of AMP target	28.15	27.21	23.37	21.21	15.0	10.0	5.0

With limited historic insight into our external flooding performance, we have focused our efforts on understanding the drivers of external floods over the last 12 months. This has revealed that

just 5.0% - 6.0% were as a result of hydraulic overload in 22/23, accepting this was an exceptionally dry year.

Based on this analysis we feel it is fair to assume that the drivers and root cause of external flooding incidents mirrors that for internal sewer flooding with blockages or sewer defects causing the majority of external flooding incidents.

As with internal sewer flooding, the focus for AMP8 will be on the number of incidents that arise from a blockage or asset defect on our sewerage network.

Rather than restate the initiatives outlined for internal sewer flooding, please refer to Section 2.1.2 which describes the activities that we also believe will deliver the stated performance improvement for external sewer flooding.

## 2.3. Sewer Collapses

### 2.3.1. Performance, targets and incentives

Sewer collapses is a measure of asset health and acts as an indicator as to the condition of our sewerage network.

We have been industry leading in this measure for a number of years.

The tables below set out our actual and projected medium and long-term level of performance.

*Table 7 – Performance and Proposed Target (unit: incidents per 1,000km of sewer network)*

AMP	AMP6			AMP7					AMP8				
Year	17/ 18	18/ 19	19/ 20	20/ 21	21/ 22	22/ 23	23/ 24	24/ 25	25/ 26	26/ 27	27/ 28	28/ 29	29/ 30
Thames Water	3.89	4.05	5.90	3.96	3.78	3.55	3.89	3.89	3.89	3.89	3.89	3.89	3.89
Industry Average	11.33	10.81	11.33	9.63	9.14	8.07	-	-	-	-	-	-	-
Industry Upper Quartile	5.48	6.20	6.57	7.02	6.31	5.55	-	-	-	-	-	-	-
Proposed Target	-	-	-	-	-	-	-	-	3.89	3.89	3.89	3.89	3.89

\*Actuals to 2022/23; Forecast thereafter

*Table 8 – Long term performance trajectory (unit: incidents per 1,000km of sewer network)*

	AMP6	AMP7	AMP8	AMP9	AMP10	AMP11	AMP12
End of AMP Year	2019/20	2024/25	2029/30	2034/35	2039/40	2044/45	2046/50
End of AMP target	5.90	3.89	3.89	3.88	3.88	3.88	3.88

Our plans over AMP8 and coming years is to maintain our current performance. Our investment will focus on addressing an aging and deteriorating asset base to maintain serviceability. Analysis of our performance across flooding and pollutions demonstrates that sewer collapses is a minority driver and investment should focus in other areas.

Having said that there are two aspects of our asset base that contribute to this metric: gravity sewer collapses and pumped rising main failures. When considering the performance trend for these different asset cohorts, different conclusions can be drawn.

Table 9 – Analysis of sewer collapses

	17/18	18/19	19/20	20/21	21/22	22/23
Sewer Collapse performance	3.89	4.05	5.90	3.96	3.78	3.55
Total No of sewer collapses	424	442	644	433	413	388
No of gravity sewer failures	354	360	565	336	331	282
No of rising main failures	70	82	79	97	82	106

Note: the methodology changed for reporting sewer collapses in 2020.

When considering the last 3 years, after the methodology change, we believe our proactive interventions associated with gravity sewers have maintained serviceability and this programme will continue in AMP8. Details of which are outlined in 2.3.2. However, when considering the condition of our large, critical gravity sewers there is now some significant “non-linear” investment required which is subject to our Asset Deficit enhancement case. Refer to TMS15 Asset Deficit for more details.

With regards rising mains we are observing a deteriorating trend in AMP7 and this is having particular impact with regards our pollution performance. In AMP8 we will increase investment in upgrading/replacing our rising main estate. This is a step change when compared to our historic capital maintenance run rates and hence is also subject to our Asset Deficit enhancement case. Refer to TMS15 Asset Deficit for more details.

### 2.3.2. Activity to maintain performance

#### Activities included within base expenditure

The activity included in our AMP8 plan is based on maintaining our performance with regards gravity sewers, albeit we will need to increase investment in our large critical assets to address deteriorating asset health and addressing a trend in deteriorating asset health with regards rising main failures. Taking each in turn.

#### Gravity Sewers

##### Inspection programme

Over the last 10 years we have implemented an extensive inspection programme focused on critical, high risk and assets we know are at risk of failure. This programme will continue and incorporates some of the following key aspects:

- Sewers crossing railways and sewers running parallel to railways.
- Our Northern Outfall Sewers that transport sewage from central London to east London for treatment.
- Sewers constructed using wedgeblock construction.
- Elevated pipe crossings with dedicated pipe supports.
- CCTV over 250 km of gravity sewers per annum where we report repeat issues generally manifested through blockages.

Our programme informs our capital maintenance activity and in AMP8 will include:

- Refurbishment of the Corporation Street section of the Northern Outfall Sewer and undertaking maintenance activity at 13 crossing locations.
- Undertake an estimated 80km of pro-active patch lining repairs and individual lengths of rehabilitation.

## Digitisation of the sewer network

As referenced for internal sewer flooding, by the end of AMP7 we will have installed 19,500 sewer depth monitors on our network, which will increase by 31,000 to 50,500 during AMP8.

These monitors will measure the depth of flows in sewers and feed signals back to a new digital platform, alongside data from our pumping stations and treatment works to proactively identify issues on the network before there is a customer service impact. Thereby enabling proactive investigation from our network engineers before there is any impact on service.

## Rising Mains

Over the last 10 years we recognise that we have not invested in our rising main estate, which we have started to address and will continue to do so in AMP8.

Rising main failures are a particular high-risk asset, and failure can result in extensive flooding and serious pollutions. We have developed a decision support tool which considers asset condition and the impact of failure, to identify those rising mains for replacement.

During AMP7 we will have completed 17km of rising main replacements which will increase to 76km in AMP8, targeting those rising mains with a history of failure.

Furthermore, we will continue to work with suppliers and innovation hubs to identify robust technology that allows in-situ surveys of rising mains without the need to remove from service for prolonged periods of time.

## Activities included within enhancement expenditure

In terms of our sewer network, we have identified a number of concerns regarding the potential future impact of an aging asset base and in particular our critical gravity sewers and rising mains. Our asset health analysis has identified that without increased investment from 2025, the risk of asset failure is increasing and the frequency of service failures and/or pollutions is expected to increase.

Both aspects are highlighted above, and we have developed an Asset Deficit investment case which seeks allowances to increase the investment on both our critical gravity sewers and rising mains. For further details refer to TMS15 Asset Deficit.

## 2.4. Customer Line of Sight - Preventing sewer flooding and taking waste away safely

Engagement with our customers, communities and stakeholders has played a key role in developing our AMP8 strategy to prevent sewer flooding and take waste away safely.

'I want you to prevent sewer flooding and take waste away safely' is a high priority for our customers, with improving resilience to internal sewer flooding in particular being an area where customers want us to focus investment. We provide further detail of our overall PR24 engagement programme in TMS03 Customer Engagement.

In this section we present the line of sight from what we heard to what we are proposing and highlight any areas where we have had to make trade-offs. There are no Enhancement Cases supporting the delivery of this outcome.

*Table 10 – How we are responding to customer insight*

What we heard		How we are responding
<b>Wastewater network resilience</b>	Customers want Thames Water to maintain and upgrade assets effectively and to increase the capacity of the wastewater network to ensure its reliability, now and in the face of future challenges.	We will repair, reline or replace old and damaged sewers; add monitors/alarms to our sewers so we get early warning of blockages and potential flooding incidents; and continue to clean our sewers and educate our customers on what not to put down the drain to prevent blockages.
<b>Internal sewer flooding</b>	Despite a very small minority of customers experiencing sewer flooding into property, customers recognise the significant distress it can cause and therefore prioritise improvements to significantly reduce it.	
<b>External sewer flooding</b>	Ineffective sewerage management can result in negative perceptions of Thames Water and its efforts to maintain the network. Customers welcomed more information on what they can do reduce blockages which result in sewer flooding events.	

### Key tensions and trade-offs between customer views and our proposals

For our wastewater plans, reducing sewage flooding is customers' top priority for enhancement investment when combining findings across all engagement sources, however some believe we should also be doing more to address this in our base expenditure. The vast majority of customers support our ambition to prevent sewer flooding by 2050, with the majority of customers wanting this to happen sooner. This is also a high priority area for non-household customers, who place a greater emphasis on enhancement areas that can reduce the risk of potential financial impact on their business.

Some of our key stakeholders, such as Environmental NGOs, look at the overall risk picture, and suggest we should balance flooding protection against the risk of wider impact on the environment such as river pollution. Customers showed a clear preference for an even paced delivery profile for the Drainage and Waste Management Plan (an even level of increased investment over 25 years). On the contrary, stakeholders were concerned about the pace of



delivery, and that the outcomes would not be achieved until late in the DWMP planning period, and earlier delivery of the solutions would be preferred.

We could potentially have delivered greater investment at a faster pace to reduce sewer flooding and align with the ambitions within our Drainage and Waste Management Plans. However, we have scaled back investment in this area during AMP8, due to deliverability and financeability constraints. Sewer flooding is part of a much wider investment programme and although we are increasing our overall spend by over 50% compared to AMP7, a number of trade-offs have been made.

Our focus has been on developing a programme that balances regulatory/legal requirements with performance and resilience improvements as per customer feedback. On this basis our flooding programme has been scaled back to that which can be delivered through our base totex allowance.

The table on the previous page, provides a summary of customer views for each of the key areas for this outcome and considers how we have addressed each aspect within our plan. In the table below we provide specific details of the feedback from the various research inputs we received including our Outcomes and Wants research, Acceptability testing, Ofwat's collaborative research, Vision 2050 research and Enhancement Case Deep Dives.

Table 11 Key customer research that has informed our wastewater strategy

Outcomes and Wants	Thames Water Priorities [1]	Topics	Ofwat collaborative research [2]	Enhancement case deep dives [3]	Acceptability and affordability testing [4]	Vision 2050 research [5]
<p><b>Customers /</b> I want you to prevent sewer flooding and take waste away safely</p>	<p>Customers place a high relative priority (4<sup>th</sup> of 10 Wants) on <b>'I want you to prevent sewer flooding and take waste away safely'</b>.</p>	<p>Sewer flooding</p>	<p>Customers place high importance on <b>'Internal sewer flooding'</b> due to the degree of impact it can have on peoples' lives i.e. health, potential move-out.</p> <p>Customers place a high priority on <b>'External sewer flooding'</b> due to the unpleasant impact it can have.</p>	<p>Customers place a high priority on <b>'Improving resilience to sewer flooding in homes'</b>; the idea of customers' properties flooding with sewage disgusts and concerns many – they feel it is part of Thames Water's essential duties to protect customers, and expect Thames Water to make significant investments to protect customers from this. However, some believe we should be doing more to address this within base expenditure.</p>	<p>Customers place a high importance on <b>'Sewer flooding'</b> as a performance commitment; internal sewer flooding is seen as the worst failure of service and our current performance is perceived to be unacceptable.</p>	<p>Customers place a high priority on <b>'Stop all sewage flooding into homes, gardens and businesses'</b>; whilst customers admit other issues resonate more strongly with them due to lack of personal experience, they generally agree that protecting homes, gardens and businesses from sewage flooding is an essential core function of Thames Water.</p>

Sources:

[1] What Customers, Communities and Stakeholders Want v18, Sia Partners, July 2023

[2] Ofwat + CCW customer preferences research, April 2022

[3] PR24 Deep Dives, February 2022; Enhancement case package options research, September 2022; Enhancement case deep dive research, May 2023

[4] Thames Water WRMP Consultation, May 2023; WRSE – Customer Preferences to Inform Long-Term Water Resource Planning, March 2021; WRSE Best Value Criteria, May 2021; WRSE Water resources quantitative research, June 2022

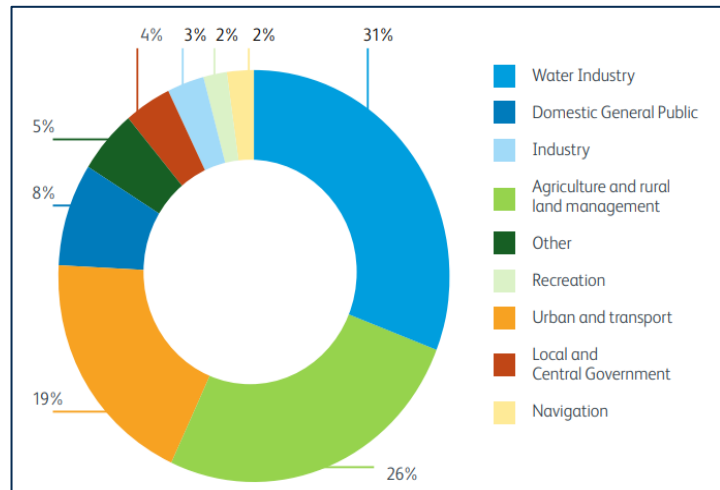
[5] Acceptability and Affordability Testing (Qualitative findings), May 2023

[6] Vision 2050 Research, May 2022

### 3. Outcome 2: Stopping polluting rivers and improving their quality

River health has been of growing concern across the UK in recent years, with many not achieving “Good” ecological status. A significant contributor to this situation has been the UK water industry, including Thames Water, with storm overflows occurring more frequently and investment in assets not keeping pace with both population growth and the impact of climate change.

In the Thames region we are the single biggest contributor to poor river water quality. We must take a leading role in addressing the problems, and not just those for which we’re directly responsible. Our approach has been to ‘speak up’ – by stating clearly that there are serious problems that we need to fix; to ‘open up’ – by providing full and open information about what is happening; and of course, to ‘clean up’ - by doing more of what we know needs to be done to improve the situation and doing it as quickly and efficiently as possible.



We were one of the first UK water companies to accept our accountability and confirm that sewage discharges to the environment are unacceptable. We reinforced our strategy to ‘open up’ by being the first to publish live information on our website as to when all our sewer overflows were discharging.

In April 2022, we set out the first version of our River Health Action Plan, describing how we are planning to improve the health of rivers in the Thames region. This plan was updated in the summer of 2023. Further every year for the last 3 years we have published a Pollution Incident Reduction Plan.

Our plans for the period 2025-2030 are founded on these two strategic documents. We have set ourselves the following key, long term objectives:

- Discharge high quality final effluent that meets the requirements of their legal permits.
- Eliminate polluting discharges to our rivers.
- Work with a broad range partners to improve water quality.

Our customers, stakeholders, regulators and Board will hold us to account through the adoption of six common Performance Commitments: Total Pollution Incidents, Serious Pollution Incidents, Discharge Permit Compliance, Storm Overflows, Bathing Water Quality, River Water Quality

- Total Pollution Incidents are reported as the total number of pollution incidents (category 1 to 3) in a calendar year emanating from a discharge or escape of a contaminant from a water company sewerage asset affecting the water environment, per 10,000km of sewer length for which the company is responsible.
- Serious Pollution Incidents are reported as the total number of pollution incidents (category 1 & 2) in a calendar year emanating from a discharge or escape of a contaminant from a water company sewerage asset or water supply asset affecting the

water environment. (There is no moderator based on the size of an individual water company).

- Discharge Permit Compliance is reported as the performance of wastewater treatment works (to treat and dispose of sewage) and water treatment works (for the water supply service) in line with their numeric discharge permit conditions. The discharge permit compliance metric is reported as the number of failing sites and not the number of failing discharges.
- Storm Overflows. The average number of spills per storm overflow will be calculated to two decimal places as follows:

$$\frac{\text{Number of monitored spills}}{\text{Number of storm overflows}} + \text{Unmonitored storm overflows adjustment}$$

- For the purpose of this performance commitment the 'Number of monitored spills' is the number of spills monitored by event duration monitors over the reporting period from all of the company's storm overflows as at 1 January of the reporting period.
- Bathing Water Quality Performance is calculated as a single overall average 'score' for bathing water quality as follows:

$$\frac{\sum_i \text{Weighting} * \text{number of bathing waters that meet the classification}}{\text{Number of bathing waters in the company area}}$$

- Where: i = bathing water classification which can be excellent, good, sufficient, or poor. Weighting is 100% for excellent classification, 66% for good classification, 33% for sufficient classification and 0% for a poor classification.
- River Water Quality The performance measure is the percentage reduction in phosphorus emissions to river catchments as a result of water company activities relative to the load of total phosphorus discharged by all wastewater treatment works during the period 1st January 2020 to 31st December 2020.

By 2050, our ambition is to have reduced our storm overflows by a minimum of 80% and eliminated pollution incidents from our asset base, whilst working with third parties to support addressing all causes of poor river water quality.

The remainder of this section looks at each of the above Performance Commitments in turn, setting out our proposed targets in the context of our current performance and providing an overview of the activity required to deliver the proposed levels of improvement.

### 3.1. Total Pollution Incidents

#### 3.1.1. Performance, targets and incentives

Over the last six years, our performance with regards the total number of pollution incidents emanating from our asset base has been better than industry average and in some years close to upper quartile. However, we have consistently missed our targets during AMP7, with our performance on average seeing little improvement over the last 6 years.

The tables below set out our actual and projected medium and long-term level of performance.

*Table 12: Historic performance: total pollution incidents (unit: incidents per 10,000km in a year)*

AMP	AMP6			AMP7				
	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25
Thames Water*	27.80	27.23	29.78	26.73	24.87	30.37	34.87	33.68
Industry Average	42.6	39.0	42.4	46.1	37.5	35.5	-	-
Industry Upper Quartile	25.3	24.5	26.2	20.8	22.4	21.5	-	-

\*Actuals to 2022/23; Forecast thereafter

From the start of AMP8, the Environment Agency will amend the classification of pollutions with category 4 pollutions (not previously incorporated into this measure) now being reclassified as category 3 incidents and hence, our future performance will include all pollution incidents, irrespective of the degree of impact on the environment. In order to measure our performance improvement through the period 2025-2030, we have backdated our performance based on this new categorisation and then forecast our performance on this new basis.

*Table 13: Revised historic performance: total pollution incidents (unit: number of incidents & incidents per 10,000km in a year)*

AMP	AMP6			AMP7					AMP8				
	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30
Cat 1-3 incidents	303	297	325	292	271	331	380	367	545	510	475	440	405
Cat 4 incidents	224	278	252	313	378	287	220	213	0	0	0	0	0
Total incidents	527	575	577	605	649	618	600	580	545	510	475	440	405
Thames Water*	48.4	52.8	53.0	55.5	59.5	56.7	55.1	53.2	50.0	46.6	43.4	40.2	37.0
Proposed Target									50.0	46.6	43.4	40.2	37.0

\*Actuals to 2022/23; Forecast thereafter

Our forecast for AMP8 represents an ambitious 30% reduction in line with the government's Water Industry Strategic Environmental Requirements (WISER) 2022.

For the period 21/22 to 25/26 the performance has been based on the length of sewer for which we are responsible at 2017/18 which was 108,980km.

For the period 26/27 to 29/30 the performance has been based on the length of sewer for which we are responsible at 22/23 which was 109,355km.

Prior to 21/22 the performance is based on actual reported sewer length.

We understand that there is a proposal to categorise compliance breaches with regards Flow to Full Treatment and Dry Day Spills as pollutions from AMP8. However, at the time of our PR24 submission this had not been confirmed nor had the definitions for these two pollution causes been confirmed. Once received then historic performance can be restated with future targets being amended to reflect the 30% reduction target accordingly.

In 2011 when previously private sewers were vested in the water and sewerage companies, an assumed/modelled assessment was completed regarding the length of sewers that were to be adopted. Since 2011, unlike other companies we have not reassessed the assumed/modelled length adopted. We are currently undertaking this activity, to bring us in line with the majority of the sector and will share the impact of this activity when completed.

In the long term our ambition is to eliminate pollutions, and by 2050 we will target a 80% reduction on the journey to this ambition, aligning with the government’s Environment Act ambition to reduce spills by 80%.

*Table14: Long term performance trajectory*

	AMP6	AMP7	AMP8	AMP9	AMP10	AMP11	AMP12
End of AMP Year	2019/20	2024/25	2029/30	2034/35	2039/40	2044/45	2046/50
End AMP performance	53.0	53.2	37.0	30.6	24.5	18.0	11.0

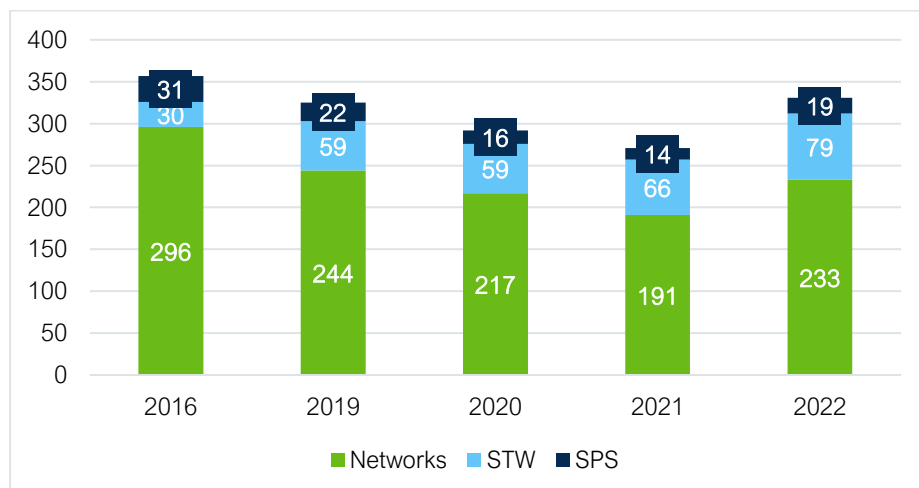
Every pollution incident that occurs is investigated and the reasons are recorded so that we target the root causes. We consider 3 different types of assets when developing our action plan for both the Pollution Incident Reduction Plan and AMP8:

- Pollutions from our sewerage network
- Pollutions from our sewage treatment works
- Pollutions from our sewage pumping stations

Between the period 2019 and 2022, the numbers of incidents from these three asset types are as follows:

Note: we have also included a reference to 2016 for a slightly longer-term comparison.

*Figure 1: number of pollution incidents by asset type (based on current reporting methodology)*



Generally, when considering each of these different asset types we can conclude that until 2022, there had been an improving trend with regards pollution incidents from our network and pumping stations, but the opposite trend has been observed for our sewage treatment works.

For these three asset types the following analysis reveals the reasons for the pollution incidents which in turn drives our current and planned interventions and investment.

## Sewerage Network

Table 15: Pollution Root Cause Analysis – Sewerage Network (unit: incident number)

	2019	2020	2021	2022
<b>Total pollution incidents</b>	<b>244</b>	<b>217</b>	<b>191</b>	<b>233</b>
Incidents caused by a blockage: <ul style="list-style-type: none"> <li>• Paper/rag/wipes</li> <li>• Fats Oils &amp; Greases</li> <li>• Roots</li> <li>• Debris/silt/scale</li> </ul>	107	93	71	82
Incidents caused by a third party	12	30	32	65
Incidents caused by a sewer collapse	17	15	10	12
Incidents related to a privately owned asset	7	7	6	9
Incidents caused by flows “crossing over” between foul and surface water systems	24	17	23	9
Incidents caused by hydraulic overloading of the network due to rainfall	12	7	8	5
Incidents due to human error	10	4	4	5
No physical asset implicated	37	24	17	21
Other causes	18	20	20	25

Note: “No physical assets implicated” references the fact that no Thames Water asset was found as the cause and hence the reason could have been related to a third party asset or third party action, however, again this was unproven. The Environment Agency when receiving reports of a river pollution assume that the cause is a TW asset and we are asked to investigate. We then need to provide evidence that this is not the case. If we can’t find any evidence of a problem with the TW system, but can’t identify the third-party source, it is reported against TW.

Our analysis highlights the difficulty in reducing pollutions from the network, due to the large number of reasons, many of which are unrelated to the condition of our asset base. For example, approximately 40% of all pollutions arise from blockages, however, in some years up to 40% can be caused by factors outside of our control such as third party action. It is clear that a focus on reducing blockages and addressing third party damage to our network will have the greatest impact, however, our plan also considers how we address defects in our asset base.

## Sewage Treatment Works

Table 16: Pollution Root Cause Analysis – Sewage Treatment Works (unit: incident number)

	2019	2020	2021	2022
<b>Total pollution incidents</b>	<b>59</b>	<b>59</b>	<b>66</b>	<b>79</b>
Incidents caused by equipment and process failure	15	17	15	19
Incidents caused by a control system failure	7	4	7	7
Incidents caused by blockages due to paper/rag/wipes and fats/oils/greases	12	8	7	17

Incidents due to human error	0	2	5	7
Incidents caused by unusual incoming “toxic” loads through the network	9	1	4	4
Incidents due to high flows and storm discharges	4	2	3	3
Incidents due to power failure	2	4	1	8
No physical asset implicated	1	6	9	2
Other incidents or cause unknown	9	15	15	12

As with the sewerage network the causes of pollutions from our Sewage Treatment Works are numerous, and our plans therefore have a suite of interventions which attack the majority of these causes. A key focus is creating greater capacity, resilience and improved process control monitoring which will address the underlying causes for a number of the reasons identified above.

### Sewage Pumping Stations

*Table 17: Pollution Root Cause Analysis – Sewage Pumping Stations (unit: incident number)*

	2019	2020	2021	2022
<b>Total pollution incidents</b>	<b>22</b>	<b>16</b>	<b>14</b>	<b>19</b>
Incidents caused by power failure	6	1	6	8
Incidents caused by equipment failure	8	6	3	5
Incidents caused by a control failure	3	1	0	2
Incidents caused by hydraulic overload due to rainfall	4	2	2	1
Incidents caused by third party damage	0	4	1	1
Other incidents	1	2	2	2

In the case of pumping stations both the failure of equipment (eg pumps) along with control systems failures and interruptions of the electricity grid form the majority of the reasons of pollutions from this asset type.

Section 3.1.2 describes the activities we are currently undertaking and plan to continue in AMP8.

#### 3.1.2. Activity to improve performance

##### Activities included within base expenditure

Our AMP8 pollution reduction plan is underpinned by our published Pollution Incident Reduction Plan.

We’ve evolved our ability to understand the forecasted pollution reduction benefit of our initiatives and taken a more critical review of which will reduce pollution incidents. This will ensure that our pollution incident reduction plan more effectively targets investment to deliver the right level, scale, and pace of where we think we can make the biggest impact. Our approach considers actions each of the three asset types under the following three over-arching themes:



- **Prevention:** Targeted initiatives to reduce the number of operational events that historically are at higher risk of causing a pollution incident, typically through asset investment and changes to our ways of working.
- **Mitigation:** Improve our response to incidents to prevent and minimise any impact on the environment and our communities.
- **Culture and behaviour:** Educate, train, and motivate employees throughout all levels of the organisation to identify risks to the environment and act urgently to prevent impact. Further developing and maintaining a culture of openness and prioritising the best environmental outcome.

Taking each of the asset types in turn our key activities are planned below.

## Sewerage Network

### Installation of Blockage Monitors

By the end of AMP7 we will have installed 19,500 sewer depth monitors on our network, which will increase by 31,000 to 50,500 during AMP8.

These monitors will feed level signals back to a new digital platform, alongside data from our pumping stations and treatment works to proactively identify issues on the network. We have integrated machine learning to predict where problems are starting to occur on the network facilitating early intervention. This will be invaluable in pin-pointing the early formation of blockages, a primary driver of network related pollutions.

Our effort will focus on specific sewers which are known to have a history of pollutions and are in close proximity to rivers and water courses.

### Sewer Cleaning

We will clean and CCTV survey over 1,500km of high-risk sewers over AMP8. This will proactively remove debris that cause blockages and identify any defects that could cause a blockage in the future. This programme will target areas we now are at risk of a pollution or internal flooding incident occurring due to the blockage/defect.

### Customer Education

As referenced in section 2.1.2 we have two methods for addressing sewer misuse: [education](#) and [enforcement](#). The key activities we undertake to encourage our customers to change their behaviours in a way that prevents and reduce blockages are set out below.

#### Education

Our educational activities on preventing sewer blockages span from widespread publicity campaigns to community-level programmes, and to engaging with individual customers and Food Service Establishments (FSEs).

In March 2023, we joined Water UK's 'Bin the Wipe' campaign, to raise awareness of the potential for wet wipes to cause blockages when flushed. We also run our own successful campaign, 'Bin it, Don't Block it' to educate customers on the impact of disposing of Fats, Oils and Greases (FOG) and unflushable materials such as wet wipes down the drain.

Our activities in the local community span across a wide range of stakeholders and settings. This year we joined the Junior Citizenship Schemes (JCS) for Year 6 pupils run by the Met Police in conjunction with Local Authorities, to educate children on sewer misuse and

unflushable materials from a young age. As part of our community educational activities, we have extended our engagement to include care homes, Guy's & St Thomas' Hospital, and His Majesty's Prisons Highdown and Downview. We also continue to work collaboratively with the other UK water companies sharing best practice and learnings at the Network Protection Forum and the Sewer Network Abuse Prevention (SNAP) group.

In terms of our engagement with households, we send written communications to inform customers on how to avoid blockages, escalating to an educational visit from a Thames Water employee if blockages continue. We are also trialling a new approach to better target blockage hotspot areas. We continue to focus on educating customers first, but if sewer misuse continues, we may escalate to enforcement, as detailed below.

We also engage proactively with FSEs to educate them on grease management within their kitchens, and to inspect FSE kitchens to ensure that grease management equipment, such as a grease trap or grease removal unit, is installed and maintained. So far in AMP7 we have visited over 16,000 businesses with over 3,700 of those installing grease management equipment for the first time as a direct result of our engagement.

### Enforcement

In instances where our education-focused approach is not effective, we are trialling the use of our powers for enforcement under Section 111 of the Water Industry Act 1991 for both household customers and FSEs.

In the case of household customers, if blockages persist following education, we will begin investigations into the specific customers responsible. We will notify them of our investigations via letter, conduct home visits to explain the impact of behaviour that causes blockages, and make customers aware of our enforcement powers if they continue to misuse the sewers.

To address non-cooperative FSEs or FSEs that create a significant operational incident, we created a dedicated enforcement team in May 2023. Our focus is on working with FSEs to make voluntary rectifications, with a target of zero prosecutions. However, if required, we will look to exercise our enforcement powers against offending FSEs that persist in sewer misuse.

### Resolve misconnections

Up to 25 pollution incidents per annum are caused by the "cross-over" of flows between the two different networks that serve communities. In many areas properties are served by a foul system which conveys wastewater from toilets, sinks, baths etc to the local sewage treatment works. There is also a second piped system which take rainwater from roofs, patios and drives to the local watercourse directly.

When flows that should be connected to the foul system are mistakenly connected to the surface water network which results in "foul" flows discharging direct to the watercourse.

In other situations, we have discovered historic cross-connections between the two systems on parts of the network for which we are responsible. Since 2020 we have identified 4,752 misconnections and have "cleaned up" 136 previously polluted surface water outfalls.

Working in collaboration with local authorities and the Environment Agency we identify surface water outfalls that are of concern and then undertake a sewer by sewer, property-by-property survey of every length to understand whether any misconnections are present.

Once any cross connections are discovered on our network they are resolved. If a misconnection is found at an individual property the owner is notified, and they are generally keen to resolve as soon as possible.

We are proposing to address a further 200 polluted surface water outfalls in AMP8.

### **Sewer Rehabilitation**

Using our data-led approach and survey work, we will proactively rehabilitate 50km of sewers during AMP8. This will target lengths of sewers which are close to sensitive watercourses and hence any problems with our network that result in a blockage could result in a pollution or resolved proactively.

### **Sewage Treatment Works**

#### **Improving flow compliance**

We recognise that we have not invested in our sewage treatment works to ensure that they comply with flow related aspects of their permits. (This is subject to an investigation by both Ofwat and the Environment Agency).

In summary, our permits allow a storm discharge to occur when the treatment works is operating at its maximum capacity to prevent the process becoming overwhelmed. This permit requires a minimum “Flow to full treatment” to have been reached before any storm discharge can occur.

We have a number of sites that we have shared with our regulators that no longer treat the required “flow to full treatment” before storm discharges occur. This is unacceptable and during AMP8 we will invest at all sites where this is occurring to reduce the risk of this non-compliance.

This will reduce the potential frequency and volume of storm discharges occurring from our sewage treatment works.

As part of our PR24 submission we recognise that the historic levels of capital maintenance at our STW's has fallen short of that required to maintain compliance. We have therefore developed a case for increased investment at our STW's to address this shortfall. (Refer to TMS15 Asset Deficit).

#### **Critical Asset Investment at our Inlet Works**

Inlet screens are the very first element of a sewage treatment process and in essence remove all debris and sanitary products prior to the flow being passed forward for treatment. Ineffective screens result in debris such as wet wipes entering the process stream which in turn can cause blockages and equipment failure.

Each year we allocate £80m to planned capital maintenance across our STW's including inlet screens. We will continue with this dedicated funding.

Another key aspect of our process relating to activated sludge treatment plants is the aeration process. We undertake programmed refurbishment of these treatment plants, including blower replacement, air diffuser replacements and control upgrades. This is a well-established programme that refurbishes all treatment plans on a regular basis. In AMP7 we will refurbish 150 aeration lanes increasing to 246 lanes in AMP8.

## **Additional Process Monitoring**

Sewage treatment works are a “living” biological process and it’s important that they remain in “good health” in order to maintain an effective treatment process. Many factors can impact this healthy environment from equipment failure to incoming “toxic” loads to the works.

By installing mid-process monitoring at our larger treatment works we can identify issues early, where the treatment process is starting to deteriorate and can intervene early. By the end of AMP7 we will have installed units at 62 (17.5%) of our highest risk STW’s

We are also installing monitors on all storm tanks to understand when they start filling outside of normal operating practices. This is typically caused by downstream equipment failure and blockages which cause flows to back up through the process and if left unattended can result in a discharge of untreated sewage through our storm tanks. This early warning system will allow us to intervene before any spill to the environment occurs.

## **Investing at our highest risk sites**

We have identified 26 treatment facilities (or 8% of our total treatment facilities) cause a disproportionate number (50%) of pollution incidents. We are making investments at these 26 sites to improve resilience and significantly reduce the risk of pollutions at these specific sites.

## **Storm Overflows**

Many of our sewage treatment works possess storm discharges. These act as a “relief valve” when the sewerage network becomes inundated during heavy or prolonged rainfall. This reduces the risk of networks surcharging and hence flooding homes, businesses and public buildings.

However, the premature use of these overflows, coupled with prolonged discharges poses a risk to the environment and can result in pollution of rivers. Our strategy to reduce storm overflows is outlined in section 2.5.

## **Sewage Pumping Stations**

### **Upgrading control systems across all pumping stations**

Equipment failure is one of the key causes of pollutions from sewage pumping stations with the root cause data showing a mixture of issues, including control systems. We have three initiatives in flight to address these causes and reduce the frequency of equipment and control associated failures: the outstation and controller programme, a “stressed” site reporting tool, and the asset improvement programme.

- We will have replaced and upgraded the majority of our control systems across our 5,000 pumping stations as we enter AMP8. These will provide much greater information into the “health” of the pumps and associated equipment. In the past we simply waited for an alarm that something had failed. With these new controllers we can monitor whether the site is starting to show signs of deteriorating performance long before an equipment failure occurs.
- With this new insight we have introduced a “stressed” site reporting tool. On a daily basis we can determine whether a station is starting to operate in an abnormal way – allowing us to send a technician to site and proactively investigate before a failure occurs.

- Using this new insight, we can proactively invest in assets as they start to show signs of deterioration. This will therefore provide a robust condition based replacement programme rather than historically adopted in the sector which has been typically time based.

We expect this programme will improve our pumping station availability to over 99.5%, reducing the risk of failures and pollutions.

In addition to upgrading our control systems (as mentioned above) we are installing technology that will automatically reset and restart pumps after they trip. This will reduce the time taken for the site to restore its full functionality and hence reduce the risk of a pollution.

### **Improving power resilience**

The second key pumping station intervention is focused on improving resilience against power failure and poor-quality power supplies which cause fluctuations and equipment to trip. We are liaising with the local electricity providers to address several areas of concern:

- Ensuring good working relationships so that we are given timely notice of planned power interruptions, to allow us to make alternative power provisions.
- Monitoring the quality of the power supply to sites that see a high level of equipment “trips” and feeding back the information so that they can make changes on their network to stabilise the supply.
- Ensuring they understand the higher risk stations, which if they suffer a power interruption could result in a pollution, thereby allowing the electricity companies to prioritise restoration in those areas.

We also recognise that during extreme weather, especially high winds, widespread power outages can occur. We will therefore invest in our fleet of mobile generators to allow us to provide alternative power supplies during events that overwhelm the local electricity distribution companies, allowing us to position mobile generators at our most sensitive sites.

### **Activities included within enhancement expenditure**

Historic under-investment in capital maintenance and an aging asset base has been a major contributing factor to the reason we now struggle to achieve Flow to Full treatment at up to 157 STW's.

We now need to urgently reverse this situation and reduce the risk of any future compliance breaches. We have developed an Asset Deficit investment case which seeks allowances to increase the investment at our STW's to resolve all Flow to Full treatment compliance issues. For further details refer to TMS15 Asset Deficit.

## 3.2. Serious Pollution Incidents

### 3.2.1. Performance, targets and incentives

Our performance with regards the number of serious pollution incidents emanating from our asset base has been poor when compared to the rest of the industry. Despite the fact that this metric is irrespective of the scale of the infrastructure for which we are responsible when compared to others, we recognise that the number of serious pollutions we are responsible for is totally unacceptable.

We are consistently one of the poorest performers in the sector.

The tables below set out our actual and projected medium and long-term level of performance.

*Table 18: Historic performance serious pollution incidents (unit:number)*

AMP	AMP6			AMP7					AMP8				
Year	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Thames Water*	10	9	15	13	12	17	16	8	7	6	5	5	4
Industry Average	5.1	5.5	4.9	4.3	5.9	6.4							
Industry Upper Quartile	2.5	2.0	1.0	2.5	2.0	2.0							
Proposed Target									7	6	5	5	4

\*Actuals to 2022/23; Forecast thereafter

*Table 19: Long term performance trajectory (unit:number)*

	AMP6	AMP7	AMP8	AMP9	AMP10	AMP11	AMP12
End of AMP Year	2019/20	2024/25	2029/30	2034/35	2039/40	2044/45	2046/50
End of AMP performance		8	4	2	1	0	0

We recognise that the aspiration must be to achieve zero serious pollutions and the government's Water Industry Strategic Environmental Requirements (WISER) 2022 by the year 2030. However, we recognise that given our current position and the challenges we have faced in reducing serious pollutions over the last 4 years it is important that we set an ambitious reduction target, but also one that is credible.

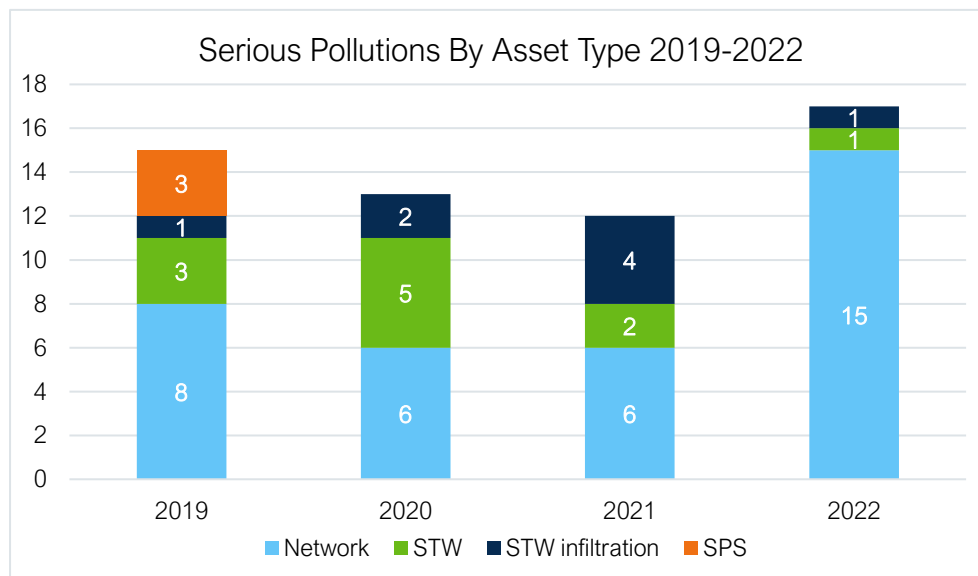
The performance forecasts reflect an ambitious improvement and is a step change to our current performance levels.

As mentioned in the previous section every pollution incident that occurs is investigated and the reasons are recorded so that we target the root causes. However, when compared to total pollutions we consider four different types of assets when developing action plans, as clean water assets can contribute to this specific measure:

- Pollutions from our sewerage network
- Pollutions from our sewage treatment works
- Pollutions from our sewage pumping stations
- Pollutions from our clean water assets

Between the period 2019 and 2022, the numbers of incidents from these four asset types are as follows:

Figure 2: number of serious pollution incidents by asset type



For these four asset types the following analysis reveals the reasons for serious pollution incidents which in turn drives our interventions and investment.

Table20: Analysis of serious pollutions

	2019	2020	2021	2022
<b>Total serious pollution incidents</b>	<b>15</b>	<b>13</b>	<b>12</b>	<b>17</b>
<i>Network</i> – incidents caused by structural asset failure	2	2	0	8
<i>Network</i> – incidents caused by blockages	2	4	5	5
<i>Network</i> – incidents caused by third parties or human error	2	0	1	2
<i>Network</i> – other	2	0	0	0
<i>Treatment Works</i> – incidents caused by infiltration/high flows and prolonged storm discharges	1	2	4	1
<i>Treatment Works</i> - Equipment & Power Failure	3	3	2	0
<i>Treatment Works</i> – Third Party	0	0	0	1
<i>Treatment Works</i> – Other	0	2	0	0
<i>Pumping Stations</i>	3	0	0	0
<i>Clean Water Assets</i>	0	0	0	0

As the analysis shows, over the last 3 years we have eradicated serious pollutions from our pumping stations and clean water assets.

Our focus therefore is on sewage treatment works and the sewerage network when it comes to serious pollutions.



### 3.2.2. Activity to improve performance

#### Activities included within base expenditure

Our AMP8 serious pollution reduction plan is underpinned by our published Pollution Incident Reduction Plan.

Many of the initiatives outlined in Section 3.1.2 are also focused on reducing serious pollutions, specifically when considering network blockages and treatment works equipment failure. However, there are two further specific initiatives focused on replacing rising mains and reducing infiltration, which will have greatest impact with regards our serious pollution performance.

#### Activities included within enhancement expenditure

##### **Rising Main Replacements**

In 2022, nearly 50% of our serious pollutions incidents were caused by structural failure; the majority of which related to failures of rising mains from our pumping stations.

We have experienced an increasing trend in rising main failures across our estate, and in particular a step change in the number causing serious pollutions. This is because of rising mains associated with terminal pumping stations failing, which carry large volumes of wastewater and hence when they fail cause significant environmental harm.

This is something we need to reverse quickly and have commenced a substantially increased rising main replacement programme in the last 2 years of AMP7, targeting replacement of 17km of rising mains. For AMP8, we have two specific initiatives that will build on this progress and will help to address the deterioration in this asset cohort.

- Increased investment in rising main replacements – this will involve a record level of investment for this asset cohort replacing 76km. We have identified 65 rising mains that if failure were to occur are at risk of causing a serious pollution.
- In parallel, and funded from base, we will increase the maintenance of our rising main air valves, which will ensure the risk of over pressurisation is reduced.

As mentioned in section 2.3.2 in terms of our sewer network, we have identified a number of concerns regarding the potential future impact of an aging asset base. Our asset health analysis has identified that without increased investment from 2025, the risk of asset failure is increasing and the frequency of service failures and/or pollutions is expected to increase.

The case for increased spend on rising mains is detailed in TMS15 Asset Deficit.

##### **Infiltration Reduction**

In our Thames Valley region, we have 53 sewerage catchments that can suffer from infiltration when ground water levels are high. Infiltration is the process whereby groundwater enters the sewerage system through minor defects. This occurs when groundwater levels rise to a level where sewerage systems are permanently submerged within the water table. This mainly happens in areas which have a chalk geology so mainly effect the southern part of the country.

Many of these defects are not detectable during “normal” conditions and do not cause any problems in draining properties when groundwater levels are at typical levels.

However, when groundwater levels rise then groundwater and surface water can inundate our systems resulting in storm overflows operating for prolonged periods resulting in serious pollutions.



During AMP8, as part of our storm overflow reduction plan, we will undertake infiltration reduction work at 17 high risk catchments. This involves sealing sewers, manhole chambers and covers, reducing the volume of water entering our system.

### 3.3. Bathing river quality

#### 3.3.1. Performance, targets and incentives

This is a new performance commitment for AMP8.

There are two designated bathing waters within our region:

- Frensham Great Pond, Surrey
- Wolvercote Mill Stream, Oxfordshire

The tables below set out the actual and projected bathing water classification for these two sites.

*Table 21 – Historical bathing water quality performance (unit: category and associated percentage score)*

AMP	AMP6			AMP7					AMP8				
Year	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30
<b>Frensham Great Pond Status</b>	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent
<b>Frensham Great Pond, Score</b>	100%	100%	100%	No score due to Covid	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>Wolvercote Mill Stream Status</b>	Not tested	Not tested	Not tested	Not tested	Not tested	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Sufficient
<b>Wolvercote Mill Stream Score</b>						0%	0%	0%	0%	0%	0%	0%	25%
<b>PC weighted score</b>	100%	100%	100%	100%	100%	50%	50%	50%	50%	50%	50%	50%	66.5%
<b>Proposed Target</b>									50%	50%	50%	50%	66.5%

\*Actuals to 2022/23; Forecast thereafter

*Table 22: Long term performance trajectory (unit: percentage score)*

	AMP6	AMP7	AMP8	AMP9	AMP10	AMP11	AMP12
End of AMP Year	2019/20	2024/25	2029/30	2034/35	2039/40	2044/45	2046/50
End AMP performance	-	50%	66.5%	83%	100%	100%	100%

Historically, Frensham Great Pond has had excellent status every year, whereas Wolvercote Mill Stream, which has only just been designated is considered poor status. Our AMP8 plan looks to address wastewater assets upstream of Wolvercote Mill Stream whilst maintaining the assets upstream of Frensham Great Pond to ensure they do not impact the excellent status this location has achieved in recent years.

In the long term we expect several more sections of rivers will be designated by DEFRA as bathing waters. We anticipate investment will be required through till 2035 to ensure our assets help the bathing water achieve excellent status. This will be accompanied by collaborative

working with other parties, as we will need to ensure all issues that can affect bathing water quality are addressed.

In our AMP8 plan we have only identified the investment required to address currently designated bathing waters. *If prior to, or during AMP8, DEFRA designate further bathing waters which require us to undertake investment, we would seek a mechanism for additional allowances to be agreed with Ofwat.*

### 3.3.2. Activity to improve performance

#### Activities included within base expenditure

##### Frensham Great Pond

Our Churt sewage pumping station is located upstream of Frensham Great Pond. We will continue to maintain and undertake capital maintenance at this location to maintain the high levels of reliability that has been experienced over the last 6 years.

##### Wolvercote Mill Stream

Partnership working has also seen a recent success for the Oxford Rivers project, a joint initiative between Thames Water, Thames21, The Rivers Trust and Oxford City Council. The results formed part of the successful application for Wolvercote Mill Stream, to achieve Designated Bathing Water Status.

Within our base expenditure we will maintain existing treatment works and the sewerage network upstream of this location to ensure full compliance with permits and to prevent pollution incidents.

We will also continue working in partnership to support all initiatives that will improve the status of the bathing water. We are providing live alerts of storm discharges at six sites in the Oxford catchment. We will review the bathing water data and identify improvements that may be necessary to achieve standards. The river will be tested regularly for bacteria which are harmful to human health in the summer bathing season and will have signage displayed at the site.

#### Activities included within enhancement expenditure

In our proposed AMP8 Water Industry Environment programme (WINEP) we will invest:

- In Ultraviolet treatment at 3 Sewage Treatment Works upstream of Wolvercote Mill Stream. The sites are Cassington, Church Hanborough and Stanton Harcourt. This will disinfect the continuous final effluent discharges from these sites.
- In reducing storm overflows at Cassington and Church Hanborough.

Further, through our programme to improve flow compliance at our STW's, we will address shortfalls in meeting our permitted Flow to Full Treatment at Cassington, Church Hanborough and Stanton Harcourt. With regards the first two sites we envisage this work will be completed during AMP7, with Stanton Harcourt being completed in the period 2025-2030.

### 3.4. Discharge permit compliance

#### 3.4.1. Performance, targets and incentives

Our performance with regards our discharge permit compliance in recent years has been better than the industry average and within the industry upper quartile, across several years.

The tables below set out our actual and projected medium and long-term level of performance.

*Table23: Historic performance discharge permit compliance (unit: percentage of sites complying with their permit)*

AMP	AMP6			AMP7					AMP8				
Year	17/ 18	18/ 19	19/ 20	20/ 21	21/ 22	22/ 23	23/ 24	24/ 25	25/ 26	26/ 27	27/ 28	28/ 29	29/ 30
Thames Water*	99.48	98.96	99.74	99.74	98.96	99.48	98.96	99.74	100	100	100	100	100
Industry Average	98.22	98.82	98.61	99.25	98.56	98.85							
Industry Upper Quartile	99.05	99.25	99.20	99.70	99.01	99.38							
Proposed Target									100	100	100	100	100

\*Actuals to 2022/23; Forecast thereafter

We recognise that due to increased complexity and cost we are unable to deliver the entire AMP7 WINEP by 2025 and up to 105 outputs will be delayed into AMP8. We are yet to receive notification from the EA how they will treat this delay, in terms of issuing new permits. Depending on the outcome of their review the forecasts in the table above may need to change, to take into account the implications for the measurement of this performance commitment.

The above forecast does not yet take into account the final WINEP for AMP8, which may again result in changes to the above.

*Table24: Long term performance trajectory (unit: percentage of sites complying with their permit)*

	AMP6	AMP7	AMP8	AMP9	AMP10	AMP11	AMP12
End of AMP Year	2019/20	2024/25	2029/30	2034/35	2039/40	2044/45	2046/50
End AMP performance	99.71	99.74	100	100	100	100	100

Treated sewage effluent is an important source of flow in many of our rivers and streams in the south east of England, particularly in dry weather conditions, and without it many of them would run dry in the summer months. All our sites have a legal permit that describes the quality and how much volume we're permitted to discharge to the river.

This measure focuses on the quality of the continuous final effluent discharge from our Sewage Treatment Works and any discharges from Water Treatment Works. Our target must be to achieve 100% compliance at all times. This is reflected in our short term and long-term targets.

We have very few failures of this metric with the number of sites breaching the quality conditions in their permits between 1 and 4 sites from our 348 STW's and 36 WTW's in an one year.

We therefore analyse the cause of each breach on an individual basis to understand the lessons learnt. Table 25 below sets out the reasons for each of the failures since 2019.

*Table 25: Root Cause of discharge compliance failures since 2019*

Year	Site	Reason for failure
2019	Aldershot STW	Elevated chromium in the final effluent traced back to an unauthorised third party discharge into the sewerage network.
2020	Bordon STW	Hydraulic overload during an intense storm caused elevated suspended solids to enter the final effluent
2021	Little Marlow STW	Elevated iron levels in the effluent following failures of a final settlement tank.
2021	Mortimer STW	Elevated levels of fats, oils and greases traced back to an unauthorised third-party discharge into the sewerage network from a fast-food establishment.
2021	Theydon Bois STW	Human error amended a flow control setting incorrectly resulting in elevated flows and subsequent overloading of the treatment capacity.
2021	Fobney Water Treatment Works	Washwater from this site discharges to the local river. Elevated levels of fine solids were present during capital refurbishment works.
2022	Chalgrove STW	Elevated ammonia in the final effluent caused by an unauthorised third party discharge into the sewage network having a "toxic effect" on the biological treatment.
2022	Fobney Water Treatment Works	Elevated iron levels in the washwater discharge.

Detailed analysis of these breaches reveals few trends due to the low numbers, but generally any breaches are as a result of:

- Equipment failures
- Incoming "shock" loads to the treatment works via our sewerage network, due to third party activity
- Inadvertent human error

Section 3.4.2 describes the activities we are currently undertaking and will continue in AMP8 along with the new interventions that are planned.

### 3.4.2. Activity to improve performance

#### Activities included within base expenditure

Compliance with our discharge permits will generally be achieved through base expenditure, as the focus will be ensuring the reliability of plant and equipment, monitoring the efficiency of the process and enhancing the capability of our operations and maintenance teams.

#### Equipment Maintenance

Through our routine capital maintenance programmes we will undertake the following key activities:

- Inlet screen refurbishment and replacement.
- Aeration Lane refurbishment
- Primary tank and final tank refurbishments

## Process Monitoring

Sewage treatment works are a “living” biological process and it’s important that they remain in “good health” in order to maintain an effective treatment process. Many factors can impact this healthy environment from equipment failure to incoming “toxic” loads to the works.

By installing mid-process monitoring at our larger treatment works we can identify issues early, where the treatment process is starting to deteriorate and/or shock loads are arriving at the site, so that we can intervene early before the quality of the discharge is compromised.

We also will maintain monitoring of specific process elements across the works including:

- Dissolved oxygen concentrations within activated sludge treatment plants to ensure full biological treatment is always maintained.
- Blanket levels on our final settlement tanks to ensure solids do not enter the final effluent especially when the site is experiencing high flows
- Final effluent monitors that measure turbidity and ammonia have been installed across 208 (60%) of our sites. Each has a site specific early warning alarm, so that when the quality starts to deteriorate we can proactively intervene and make the necessary process changes.
- At sites where we have known, unauthorised discharges into the upstream sewerage network we have installed automatic sampling units at the inlet works to help identify when shock loads are occurring.

## Training and Development

We have developed a competency framework for all staff working on our sewage treatment works. This not only builds the knowledge and competency of our staff with regards discharge permit compliance, but the programme also helps with the reduction in pollutions from our sewage treatment works.

Our cultural programme is starting to embed, with pollution awareness training in place for our wastewater teams and training our wastewater managers in more detailed sewage treatment process modules. We’re moving to a more open culture of reporting potential incidents and escalating problems with our equipment.

### Activities included within enhancement expenditure

A key risk to sewage treatment works compliance relates to population growth. As new properties are constructed or re-developed increased numbers of customers are connected to our treatment facilities.

All of our works are designed to a future design horizon to take into account population growth, however, there comes a time when further growth is expected, yet the sewage treatment works is reaching its capacity.

The key element of concern is the additional “biological” load arriving at the works and without increasing capacity of our sewage treatment works then the quality of our continuous discharge will start to suffer.

We have therefore considered the existing capacity across all 348 sewage treatment works with discharge permits, mapped this to ongoing development and hence population growth site by site. This has revealed that 15 STW’s will have their treatment capacity exceeded during the period 2025-2030.

An enhancement case will be submitted seeking additional allowances to invest at these 16 sites to ensure the treatment capacity will be increased to cater for the additional customers that will be connected to those sites. The sites where increased capacity is proposed are:

- Andoversford
- Arborfield
- Bicester
- Blunsdon
- Cassington
- Chalgrove
- Chipping Norton
- Culham
- Didcot
- Highworth
- Moreton in Marsh
- Stansted Mountfichet
- Thame
- Wantage
- Wheatley

### 3.5. Storm overflows

River health has been of growing concern across the UK in recent years, with many not achieving “Good” ecological status. A significant contributor to this situation has been the UK water industry, including Thames Water, with storm overflows occurring more frequently and investment in assets not keeping pace with both population growth and the impact of climate change.

In the Thames region we are the single biggest contributor to poor river water quality. We must take a leading role in addressing the problems, and not just those for which we’re directly responsible.

We were one of the first UK water companies to accept our accountability and confirm that sewage discharges to the environment are unacceptable. We reinforced our strategy to ‘open up’ by being the first to publish live information on our website as to when all our sewer overflows were discharging.

In April 2022, we set out the first version of our River Health Action Plan, describing how we are planning to improve the health of rivers in the Thames region.

Our pollution reduction plan is outlined in section 3.1, this section considers how we will start reducing storm overflows during AMP8, as we will look to eliminate 80% of storm discharges by 2050.

Storm discharges have been a key aspect of the design of our sewerage systems in the UK for over 100 years. Large proportions of drainage infrastructure in the UK is classed as “combined”. In essence this is a system where a single sewer conveys not just wastewater from our homes and businesses but also rainwater – whether from properties, highways, footpaths, carparks and in some cases train lines. Further in some geographies sewers are to assist with land drainage. During storms or during prolonged periods of wet weather, these systems can therefore become overwhelmed with rainwater, and to prevent systems backing up into people’s homes and business storm overflows were created to relieve the systems.

In the majority of cases these overflows are screened and, in some cases, receive some treatment, however, they have a significant impact on our river health, and we must now consider unacceptable. This therefore requires a change in approach to our drainage infrastructure and AMP8 provides the first major opportunity to start making the multi-billion pound investment needed to facilitate this change.

#### 3.5.1. Performance, targets and incentives

With the installation of Event Duration Monitors only taking place in the last 3 years, there is little historic performance data available for both Thames Water and the entire water industry.

The tables below therefore set out the historic data that is available and projected medium and long-term level of performance targets for Thames Water alone, as there is no comparative data for the sector that has been published.



Table 26 – Historic performance and proposed targets storm overflows (unit: average number of spills per overflow)

AMP	AMP7					AMP8				
Year	20/21	21/22	22/23	23/24	24/25	2025	2026	2027	2028	2029
Thames Water*	43.83	37.56	23.85	28.30	23.84	22.57	21.37	21.04	19.92	17.21
Industry Average	Due to differences between the AMP8 PC methodology and published EA data there is no directly comparable performance measures for this period.			-	-	-	-	-	-	-
Industry Upper Quartile				-	-	-	-	-	-	-
Proposed Target						22.57	21.37	21.04	19.92	17.21

\*Actuals to 2022/23; Forecast thereafter

The improved performance in 22/23 could be misleading, as it was largely due to the dry year we experienced in the southeast of England. Currently, the number of overflows primarily determined by the intensity and volume of rainfall that companies experience.

Our long-term targets are as follows:

Table 27: Long term performance trajectory (unit: average spills per storm overflow)

	AMP7	AMP8	AMP9	AMP10	AMP11	AMP12
End of AMP Year	2024/25	2029/30	2034/35	2039/40	2044/45	2046/50
End AMP performance	23.84	17.21	14	11	8	5

Our long-term aspiration has been aligned to the government’s target of ensuring no overflow has any ecological impact by 2050. The Environment Act states that there can be no more than 10 spills per overflow by 2050, however, we believe that the target will need to be closer to 5 spills per overflow in order to meet the more stringent target of no ecological impact. This will be validated through the investigations programme in AMP8.

Overflows are located at 3 locations across our entire wastewater system:

- Overflow located on the piped sewerage network – the overflow is typically located at a high level within a manhole and is screened.
- Overflow located at a pumping station – the overflow is located at a high level within the wet well and is screened.
- Overflow at a sewage treatment works – these overflows are located at the inlet works and typically involve flows being screened and passing through a storm tank providing settlement.

Over the last two years the number of overflows from these 3 locations are highlighted in the table below.

*Table28: Source of storm overflows by asset type*

	2020	2021	2022
Average no. of spills from our sewerage network	25.4	19.2	11.3
Average no. of spills from pumping stations	15.7	16.4	7.6
Average no. of spills from sewage treatment works	56.2	45.2	24.2

Our conclusion is that spills from our sewage treatment works occur at least twice as frequently as the other asset cohorts and hence forms a key focus of our investment plan in AMP8.

The measure for this performance metric reflects the number of spills per overflow, however, this does not necessarily reflect the overall number or volume of discharges from a company's assets and hence the overall environmental impact. Considering the EA's annual report for the same period the total duration of spills from a water company's assets is as follows:

*Table 29 – total hrs duration of storm overflows (hrs) from a water company's assets*

	2020	2021	2022	No of Overflows
Anglian	170,547	194,594	89,514	1,552
Northumbrian	178,229	220,560	107,536	1,564
Severn Trent	558,699	461,135	249,116	2,466
South West	375,372	351,785	290,271	1,342
Southern	197,213	160,984	146,819	978
Thames	215,886	163,090	74,693	777
United Utilities	726,450	540,753	425,491	2,254
Wessex	237,035	151,258	129,957	1,300
Yorkshire	420,419	406,131	232,054	2,221

By considering the overall volume of storm spills from a company's assets, then our performance is within the upper quartile for the sector.

### 3.5.2. Activity to improve performance

#### Activities included within base expenditure

The vast majority of our reduction in storm overflows will result from enhancement expenditure as we upgrade the capacity of our sewage treatment works, and sewerage network whilst identifying opportunities to remove surface water from our systems and direct rainwater to local rivers and streams.

As can be seen in our performance over the last three years, during drier weather storm overflows reduce significantly demonstrating that changes to our base operation and maintenance associated with our existing asset base will not drive any significant reduction in storm overflows.

Having said that we understand the importance of maintaining our assets, so that equipment failure or blockage does not result in premature storm overflows. This maintenance activity is funded from our base expenditure and will ensure the current position is maintained.

## Windrush and Chess Innovation Study

In some areas of our region groundwater infiltration is one of the key reasons for prolonged storm discharges. In our Thames Valley region, we have 53 sewerage catchments that can suffer from infiltration when ground water levels are high. (As explained in section 3.2.2).

To test new techniques and develop a more mature approach to managing unwanted flows, we' selected two catchments for an accelerated programme of work to reduce escapes/overflows to the environment. The focus in these catchments, the Chess and the upper reaches of the Windrush, is to reduce groundwater and surface water inflow (to sewer misconnections and inundation) and detailed mapping of the sewers to detect misconnections. We're using the results of these pilots to inform our plans for other river catchments post 2025. A package of sewer sealing, manhole chamber sealing and making manhole covers watertight was completed in 2022 in the pilot areas, and we're currently reviewing the results from winter 2022/23 to understand the benefits.

### Activities included within enhancement expenditure

#### Tideway Tunnel

The Thames Tideway Tunnel is on track for commissioning to start in the last year of AMP7. With an investment of £4.6 billion, it represents the largest and most significant wastewater project since Sir Joseph Bazalgette created London's sewage system in the 1860s. The tunnel will prevent millions of tonnes of untreated sewage, mixed with rainwater, from entering the tidal reaches of the River Thames via storm overflows each year.

It's a unique, once-in-a-generation project that will expand London's sewer network. Most importantly, it will dramatically improve the water quality of the River Thames by reducing the total volume of discharges by 95% in a typical year. As a vital piece of infrastructure for London, it's essential for the growth of the capital and the UK.

We've already built the Lee Tunnel, which is delivering significant environmental benefits, to which the Thames Tideway Tunnel will connect. In November 2022, we reported the preliminary findings from a fish survey in the River Lee to help assess the impact of the operation of the Lee Tunnel on water quality. The findings are encouraging. A total of 714 fish from 12 species were identified, where previously there had been little aquatic life.

For more details of this unique project please refer to TMS47 Thames Tideway.

#### Improving flow compliance

We recognise that we have not invested in our sewage treatment works to ensure that they comply with flow related aspects of their permits. (This is subject to an investigation by both Ofwat and the Environment Agency).

In summary, our permits allow a storm discharge to occur when the treatment works is operating at its maximum capacity to prevent the process becoming overwhelmed. This permit requires a minimum "Flow to full treatment" to have been reached before any storm discharge can occur.

We have a number of sites that we have shared with our regulators that no longer treat the required "flow to full treatment" before storm discharges occur. This is unacceptable and during AMP8 we will invest at all sites where this is occurring to reduce the risk of this non-compliance.

This will reduce the potential frequency and volume of storm discharges occurring from our sewage treatment works.

(As explained in section 3.1.2 we will be submitting a case for increased investment at our STW's to address this issue. Please refer to TMS15 Asset Deficit).

### **Water Industry National Environment Programme**

This regulatory programme is the primary driver of our storm overflow reduction, both the completion of our AMP7 programme alongside our AMP8 proposed programme will deliver an average spill reduction of over 5 spills per overflow by 2030.

Across our AMP7 WINEP we will be delivering capacity upgrades at 27 sewage treatment works and increasing storm tank capacity at 34 sites.

In conjunction, during AMP8, we will deliver improvements at 106 high priority storm overflows with investigations at the remaining 348 potentially, high priority sites to inform investment beyond AMP8.

### 3.6. River water quality (phosphorous)

Despite past reductions in how much we discharge, the level of nutrients (nitrates and phosphorus) in our rivers is often more than they can cope with. Excess nutrients can cause algae to grow quickly, which shades out the plant life on which insects thrive. In the Thames catchment, phosphorus is the main problem, and a large proportion of this comes from human wastewater.

#### 3.6.1. Performance, targets and incentives

This is a new performance commitment for PR24 which measures the reduction in phosphorus emissions to river catchments relative to the base period as a result of water company activities when delivering their functions. This PC will incentivise companies to work to reduce their phosphorus emission.

This performance commitment will reflect the phosphorus reduction in our STW discharges that will be delivered through the WINEP.

There is therefore no previous performance metrics and is simply a measure of the improvement that will be delivered through investment as part of the AMP8 WINEP.

Our 2020 baseline position has been calculated from the annual mean daily flow in 2020 and the annual mean concentration of phosphorus in 2020 at the sewage treatment works that discharge to freshwaters. Where phosphorus measurements are not available at a site in 2020, we have assumed an annual mean concentration of 5 mg/l.

The baseline is 1,062,270 kg of phosphorus in 2020. Our improvement trajectory to the end of AMP8 is as follows:

Our improvement trajectory for AMP8 is as follows:

*Table 30 – historic and forecast performance phosphorous reduction (unit: percentage reduction from a 2020 baseline)*

	AMP7			AMP8				
	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30
Thames Water	8%	4%	4%	5%	5%	8%	15%	20%

*\*Actuals to 2022/23; Forecast thereafter*

This profile reflects the impact of the delayed AMP7 WINEP projects, and our proposed approach to WINEP in AMP8, which may be subject to change, given the ongoing discussions with DEFRA and the EA.

Note: this measure is impacted by the volatility of the weather and the 8% reduction (actuals) was partly as a result of a very dry year in 2022/23 which reduced the flow and hence load being discharged. This in turn generated a larger percentage reduction when compared to a baseline of 2020. From 23/24 the forecasts are based on average load and flow and hence the decline from 8% to 4% when compared to the 2020 baseline.

In the longer term our plan is to achieve the 80% reduction in sewage effluent by 2038 (when compared to the 2020 baseline) as per the government target laid out in the Environment Act.

Table31: Long term performance trajectory (unit: percentage reduction from a 2020 baseline)

	AMP7	AMP8	AMP9	AMP10	AMP11	AMP12
End of AMP Year	2024/25	2029/30	2034/35	2039/40	2044/45	2046/50
End of AMP performance	4%	20%	50%	80%	80%	80%

### 3.6.2. Activity to improve performance

#### Activities included within base expenditure

This performance commitment is a measure of the improvements being delivered in phosphorous reduction through our Water Industry Environment Programme and hence will be delivered through enhancement expenditure alone.

#### Activities included within enhancement expenditure

There are two programmes that will deliver reduced phosphorous in our continuous final effluent discharges from our sewage treatment works.

#### **AMP7 WINEP Completion**

During AMP8 several projects funded in AMP7 will be commissioned and completed delivering a phosphorus reduction of 205 by 2030.

#### **AMP8 WINEP**

Due to both financeability and deliverability challenges associated with a significant investment programme in AMP8, it is envisaged that any further phosphorous reductions beyond those being delivered through the AMP7 WINEP will be phased for delivery in the period 2030-2038.

Our long-term strategy is focused on resolving environmental challenges through nature-based solutions and in particular the collaborative work we undertake with partnerships to manage river basins in a long-term, sustainable manner. This is delivering results, however, it does not form part of the statutory programme within WINEP. The Secretary of State steer on 5<sup>th</sup> July 2023, was to prioritise the statutory elements prior to any further investment. This has resulted in us removing our smarter water catchment investment (“Advanced WINEP”) from our PR24 submission. However, subject to Defra’s agreement, we would welcome the opportunity to revisit this decision, given the support from our environmental partners and the long term benefits this programme could deliver.

### 3.7. Line of Sight - Stop polluting rivers and improving their quality

Engagement with our customers, communities and stakeholders has played a key role in developing our AMP8 strategy to stop polluting rivers and improve their quality.

'I want you to stop polluting rivers and improve their quality' is ranked as a medium relative priority by our customers who first want us to focus on providing a reliable water and wastewater service. Our stakeholders, however expect us to take a more balanced approach to core service improvements and delivering positive environmental impact. We provide further detail of our overall PR24 engagement programme in TMS03 Customer Engagement.

In this section we present the line of sight from what we heard to what we are proposing and highlight any areas where we have had to make trade-offs. For our enhancement cases in this area, we also provide further evidence of line of sight, including customer views supporting the need for investment and our proposed solutions in:

- TMS26 Enhancement Case: WINEP
- TMS24 Enhancement Case: Sewage Treatment Growth

*Table 32 – How we are responding to customer insight*

What we heard		How we are responding
<b>Pollution incidents</b>	Customers have a low tolerance for pollution of rivers with untreated sewage and want to see significant efforts made to reduce both the frequency and severity of pollution events – they support Thames Water’s commitments to reduce, and ultimately eliminate, river pollution by 2050.	We will repair, reline and replace old and damaged sewers, and provide more storage on our sewer network. We will also add monitors/alarms to our sewers so we get early warning of potential pollution incidents, and continue to clean sewers and educate customers to help reduce blockages.
<b>Improving river quality</b>	Customers and stakeholders want Thames Water to protect and improve the quality of rivers and the environment and want to see clean, well flowing rivers. Customers want Thames to ensure healthy rivers that support a wide variety of activities including wildlife, fishing and recreation including swimming.	On top of reducing spills into rivers, we will work to more remove phosphorous from treated water entering rivers, and undertake activities relating to chemical investigations, invasive species, eels and fish passage, bathing water, biodiversity, habitat, flow monitoring, river monitoring, nutrient neutrality

#### Key tensions and trade-offs between customer views and our proposals

From our synthesis of research and triangulation of customers priorities, we found that customers generally give lower priority to environmental initiatives (protecting or improving the environment) compared to us providing reliable water and wastewater services at an affordable price. Our stakeholders, particularly environmental NGOs, however, seek a balanced focus on improving core service and simultaneously delivering positive environmental impact.

When testing the various elements of our WINEP programme, customers demonstrated higher support for certain aspects. Reducing river spills is a high priority for customers, potentially driven by recent media influence and concerns were expressed around this worsening in light of external pressures.

For river health, customers support our plans for improvements and generally agree that this should be fixed as quickly as possible. However, some feel the current health levels are already acceptable and hence it is a relatively lower priority for customers. Stakeholders from Local Government and community groups, however, want Thames Water to go further and 'remove' rather than 'reduce' the strain on rivers. For our customers, making rivers safer for swimming and bathing is seen as important but is a lower priority compared to other parts of WINEP. Customers are disappointed that water quality is 'poor' but achieving improvements are seen as a 'nice to have' and not to be prioritised over other improvements.

Due to deliverability and financeability constraints we have looked to phase aspects of our potential AMP8 WINEP beyond AMP8. In doing so, we have taken account of customer feedback and ensured we retain investment in pollution reduction, reducing spills and ensuring safe bathing waters. Other aspects such as nutrient reduction and river restoration projects have been phased into AMP9 and AMP10.

The table on the previous page, provides a summary of customer views for each of the key areas for this outcome and considers how we have addressed each aspect within our plan. In the table below we provide specific details of the feedback from the various research inputs we received including our Outcomes and Wants research, Acceptability testing, Ofwat's collaborative research, Vision 2050 research and Enhancement Case Deep Dives.



Table 33: Key customer research that has informed our wastewater strategy

Outcomes and Wants	Thames Water Priorities [1]	Topics	Ofwat collaborative research [2]	Enhancement case deep dives [3]	Acceptability and affordability testing [4]	Vision 2050 research [5]
<p><b>Environment /</b> I want you to stop polluting rivers and to improve their quality</p>	<p>Customers place a medium priority (6<sup>th</sup> of 10 Wants) on <b>'I want you to stop polluting rivers and improve their quality'</b>.</p>	Pollution incidents	<p>Customers place medium importance on <b>'Pollution incidents'</b>; managing pollution incidents very important as perceived to relate to malpractice, however, low awareness/ knowledge impacts importance.</p> <p>Customers place medium importance on <b>'River water quality'</b> as this is perceived to be central to environment and connected to supply.</p>	<p>Customers place a medium on priority on <b>'Reducing sewage spills into rivers'</b>; this has increased in importance for customers potentially driven by recent media influence. Concerns were expressed around this worsening in light of external pressures.</p> <p>Customers place a low priority on <b>'Improving river health'</b>; customers support improvements in river health and generally agree that this should be fixed as quickly as possible. However, some feel the current health levels are already acceptable.</p>	<p>Customers place a high importance on <b>'Pollution incidents'</b> as a performance commitment; customers are subject to frequent negative media coverage on this issue. Our performance here is therefore perceived to be unacceptable by customers.</p> <p>Customers place high importance on <b>'NEP Waste'</b> as an enhancement case; there is strong support to eradicate pollution of rivers and sees, despite the high cost.</p>	<p>Customers place a medium priority on <b>'Prevent heavy rainfall from causing sewage overflows and sewage spills into rivers'</b>; customers see preventing sewage spills into rivers as an important issue due to potential health risks, particularly those who live near rivers them, and support plans to eradicate pollution incidents. However, customers recognise that other issues as more of a priority if not directly impacted.</p> <p>Customers place a medium priority on <b>'Lead the improvement of rivers in the region so they become among the healthiest in the UK'</b>. Customers place importance on improving river health for two main reasons: some for recreational purposes and some for environmental elements. However, others feel that this issue is more exclusive to people who frequent rivers regularly and thus not a priority to themselves personally.</p>
		Storm overflows	<p>Customers place lower importance on <b>'Storm overflows'</b> as customers do not perceive they experience them directly and do not equate with sewer flooding prevention around property.</p>	<p>Customers place a medium priority on <b>'Tackling groundwater sewer infiltration to prevent sewer overflows'</b>; reducing sewer spills as a result of infiltration is important for customers but there are some concerns about the longevity of the proposed enhancements.</p>		
		Bathing water quality	<p>Customers place lower importance on <b>'Bathing water quality'</b> as this is perceived by customers to be avoidable and not felt to be a real problem – views differ at a local/regional level, where people are actually affected.</p>	<p>Customers place a low priority on <b>'Making rivers safe for swimming and bathing (WINEP)'</b>; customers are disappointed that water quality is 'poor' but achieving improvements are seen as a 'nice to have'</p>		

				and not to be prioritised over other improvements. There is more concern around the quality of the rivers that Thames Water extract from.		
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Sources:

[1] What Customers, Communities and Stakeholders Want v18, Sia Partners, July 2023

[2] Ofwat + CCW customer preferences research, April 2022

[3] PR24 Deep Dives, February 2022; Enhancement case package options research, September 2022; Enhancement case deep dive research, May 2023

[4] Thames Water WRMP Consultation, May 2023; WRSE – Customer Preferences to Inform Long-Term Water Resource Planning, March 2021; WRSE Best Value Criteria, May 2021; WRSE Water resources quantitative research, June 2022

[5] Acceptability and Affordability Testing (Qualitative findings), May 2023

[6] Vision 2050 Research, May 2022

## 4. Outcome 3: A positive impact on the community

We are responsible for some incredibly rich and diverse habitats within our region. We take great care to balance the needs of the animals, plants, birds and insects that call our sites home and are committed to continually improving our biodiversity performance at those sites and beyond.

We own and manage land in over 8,000 locations, from the Cotswolds in the west to Essex in the east. In total we manage a total of 66km<sup>21</sup> of land that we have established as our habitats baseline. This is an area that is around seven times larger than Richmond Park in London.

- We directly manage 5 nature reserves and a further 22 are managed by our conservation partners.
- Over 250 sites have been identified as being sites of biodiversity interest (SBI)
- 12 are sites of special scientific interest (SSSI).

These sites support a range of important animals or plants, including bats, dormice, otters, pollinating insects, orchids and wildflower meadows. Many of our open water reservoirs are of international importance due to the large number of wetland bird species they provide a home for.

Alongside a focus on biodiversity, our publicly accessible sites host two directly managed recreational fisheries, sailing clubs, heritage groups and other sporting clubs.

With the recent development of the Defra biodiversity calculator we are now able to measure the impact of investment we make for nature on our sites and as part of our 2025 – 2030 business plan have committed to increasing biodiversity at 7 of our wastewater sites, above and beyond that which has been achieved to date and which we currently manage.

Our customers, stakeholders, regulators and Board will hold us to account through the adoption of a new common Performance Commitments: Biodiversity.

- Biodiversity measures the net change in the number of biodiversity units on nominated land per 100km<sup>2</sup> of land in the company's area. A biodiversity unit is a measurement of an area's value to wildlife. It is based on the size and quality of habitats, and whether the habitat is sited in an area identified as being of strategic significance for nature.

By 2050, our ambition is to *“Implement a balanced land-use strategy, delivering investments, local jobs, biodiversity gain and access to nature-based recreation”*

The remainder of this section sets out our proposed target for biodiversity providing an overview of our approach and the activity required to deliver the proposed levels of improvement.

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<sup>1</sup> Based on review of GIS data of Thames Water's landholding in March 2023

## 4.1 Biodiversity

### 4.1.1 Performance, targets and incentives

During AMP7 we became the first water company to have a bespoke biodiversity net gain PC, adopting the Defra methodology of measuring biodiversity net gain units.

In that time, we have created 301 biodiversity units across 100 reportable sites across our entire estate.

Now that biodiversity is a common PC, we have adopted the common methodology and will measure our performance based on the biodiversity unit gain in AMP8 alone.

The projected biodiversity net gain numbers are based on an estimated habitat baseline and hence are indicative only at this stage. Survey work will commence in spring 2024 which will provide a more accurate baseline and projected biodiversity net gain through AMP8.

We understand that sites can be added into the performance commitment at any point within AMP8. Therefore, if any site fails to meet their projected targets or if we are unable to do achieve all of the predicted habitat improvements due to reasons beyond our control e.g., contamination, archaeology; we will adapt our plans and new sites may be nominated.

*Table34: AMP8 forecast performance trajectory (unit: biodiversity gain/units per 100km<sup>2</sup>)*

Year	25/ 26	26/ 27	27/ 28	28/ 29	29/ 30
Thames Water (biodiversity units)	0	0	0	61.38	87.32
PC – biodiversity units/100km <sup>2</sup>	13,754.45	13,754.45	13,754.45	13,754.45	13,754.45
Proposed Target	0	0	0	0.45	0.63

The profile in the first three years of the AMP reflects the activity being undertaken to establish new habitats coupled with the fact that no change can be recorded until the second site visit, four years from the first visit (25/26).

We are yet to finalise our long-term plan and targets to 2050 for biodiversity. Through our survey work starting in 2024 this will be developed through AMP8 and in conjunction with our charity/environmental partners.

Overall, through developing our company wide habitats baseline we have identified a company-wide total of 7.794km<sup>2</sup> that is classed as “*land that has open habitats*” and is available for biodiversity enhancement. Across our water and wastewater sites we will improve 1.14km<sup>2</sup> of this land during AMP8.

#### 4.1.1. Activity to improve performance

##### Activities included within base expenditure

##### Our Approach

In alignment with the definition for the biodiversity performance commitment, during PR24 we will measure the net change in the number of biodiversity units on land within nominated sites.

Sites nominated are based on their potential for biodiversity enhancement, and where there is support for habitat enhancement/creation works from within our business or external stakeholders including Natural England, conservation charities (such as RSPB and Mammal Society) and or community groups. This has been assessed as 7.794km<sup>2</sup>, across water and wastewater sites in total.

Land identified as being required for other commitments, such as WINEP, water resources management plan, growth projects, solar energy projects or other uses will be excluded from nomination for biodiversity enhancement, to avoid further conflicts between land uses.

Baseline biodiversity units will be assessed based on habitat type and condition data gathered during a site visit by an appropriately qualified person, for each given piece of land nominated by the company. The methodology to be applied during the surveys will be informed by the baseline pre-intervention assessment method described within the Natural England publication “Biodiversity Metric 3.1 Auditing and accounting for biodiversity Technical Supplement (April 2022)”.

The change in biodiversity units, relative to the baseline, will be calculated using the Natural England Biodiversity Metric 4.0. All survey work (including botanical surveys and condition assessments) to inform the biodiversity unit assessment will be undertaken by an appropriately qualified and trained person. The methodology will follow that published by Natural England alongside the Biodiversity Metric. These requirements will follow the specification within “*BS 8683: Process for designing and implementing biodiversity net gain*” and also Thames Water’s own Biodiversity Net Gain Strategy document, due to be published summer 2023.

All habitat and condition data for each site will be captured within a GIS database, along with time stamped (and ideally georeferenced) photographs taken during the site visit (along with any other imagery collected, such as drone footage).

Surveys will be repeated every four years. The change in biodiversity units, on a given piece of land, will be the aggregate change between the latest survey and the original (baseline) survey. No change can be recorded until the second site visit, four years from the first visit. Once the original (baseline) survey has been completed for the purpose of the performance commitment, Thames Water will continue to survey land every four years to record the habitats present and their condition.

## Site Enhancements

The following investment and plans will be delivered through AMP8 at 7 wastewater operational sites:

- Year 1: we will deliver a combination of wetlands, grassland enhancements and tree planting at Godalming and Beddington.
- Year 2: we will deliver a combination of wetlands, grassland enhancements and tree planting at Aylesbury, Bracknell, Fiddlers Hamlet.
- Year 3: we will deliver a combination of wetlands, grassland enhancements and tree planting at Bishop Stortford and Tring.
- Year 4 and 5: the funding is set aside for contingencies such as replanting failures, or additional management to move the units in a positive direction if not achieved units in years 3 and 4 of monitoring.

In summary, across the 7 sites, various ecological enhancement works will be undertaken. These will include enhancement of grassland habitats to encourage wildflower species, improving habitat connectivity through planting of trees/hedgerows and wetland/pond creation. All enhancements will be linked to nature recovery plans prepared for each site.

These new initiatives will be supported with the ongoing management of 100 sites created in AMP 7 across our entire estate.

## Reporting

We will report all habitats, including irreplaceable habitats or habitats designated as Sites of Special Scientific Interest. In addition, we will also record and report separately on the net change in biodiversity units based on the different biodiversity unit types. This includes reporting on the following three categories:

- Area
- Hedgerows; and
- Rivers

As per the Ofwat Biodiversity Performance Commitment definition, where the survey shows a positive net change in biodiversity on a site, we will continue to report the same net change in biodiversity each year until the next survey is scheduled (i.e after four years). This approach will apply in the following instances:

- When the change is not reported more than four times without a further baseline preintervention assessment;
- When appropriate management is in place to, at a minimum at least, conserve biodiversity; and
- When the company has no information that there may have been a loss in biodiversity, that it has not taken proportionate action to address.

If any of these conditions do not apply, we will record zero biodiversity units on that site, resulting in a negative net change on that site.

Where the survey shows a negative net change in biodiversity on a site, we will continue to report this until a further survey demonstrates biodiversity units on the site have changed. However, as described above, due to the time required to achieve target condition, this could take over 10 years. Accordingly, this could have the unintended consequence of incentivising 'easy wins' of enhancing low biodiversity value habitat rather than higher biodiversity value habitats at scale which may take longer to reach to target condition. It may be possible that an 'interim gain' in biodiversity units could be claimed for meeting a lower condition target by year 5. We propose that this should be agreed in advance with Ofwat.

## Activities included within enhancement expenditure

There are no activities planned to be funded through an Enhancement Case for this performance commitment.

## Customer line of sight – Positive impact on the community (Biodiversity)

Engagement with our customers, communities and stakeholders has played a key role in developing our AMP8 strategy to reduce our environment impact and restore the environment, and have a positive impact on the community .

Our activities in this area, such as improving Biodiversity, while important to our customers, tend to be a low relative priority, compared with core service areas. We provide further detail of our overall PR24 engagement programme in TMS03 Customer Engagement.

In this section we present a line of sight summary from what we heard to what we are proposing in this area

*Table35: How we are proposing to respond to customer insight*

What we heard		How we are responding
<b>Biodiversity</b>	<p>Natural spaces are important to the public and they enjoy a wide range of recreational activities in nature. Customers feel that the natural environment improves quality of life.</p> <p>They would us to invest into the communities we operate in, including through programmes that provide access to our sites for recreation purposes.</p>	<p>Developing new habitats across 9 operational sites including creation of new grasslands, wetlands and planting of trees and hedgerows.</p> <p>This is in addition to the 100 biodiversity sites created in AMP7 which we will continue to manage.</p> <p>Management of 12 Sites of Special Scientific Interest and 25 nature reserves.</p> <p>We will continue to open up our sites to the public including recreational fisheries, sailing clubs, heritage groups and other sporting clubs.</p>

The table on the above, provides a summary of customer views for each of the key areas for this outcome and considers how we have addressed each aspect within our plan. In the table below we provide specific details of the feedback from the various research inputs we received.

Table 36: Key customer research that has informed our biodiversity plans

Outcomes and Wants	Thames Water Triangulated Priorities [1]	Topics	Ofwat collaborative research [2]	Enhancement case deep dives [3]	Acceptability and affordability testing [5]	Vision 2050 research [6]
<p>I want you to reduce your impact and restore the environment</p> <p>I want you to have a positive impact on the community</p>	<p>Customers place a medium priority (7<sup>th</sup> of 10 Wants) on <b>'I want you to reduce your impact and restore the environment'</b>.</p> <p>Having <b>'a positive impact on the community'</b>, which includes activities to improve biodiversity across communities, while important to customers, is a low relative priority compared with core service areas (10<sup>th</sup> of 10 Wants).</p>	Biodiversity	Customers place a medium importance on <b>'Biodiversity'</b> which becomes important as a proxy for environmental policy, but the topic is ill understood.			<p><b>'Use of the land Thames Water owns to benefit wildlife and create natural spaces for people to visit'</b> was ranked a low priority for customers in our Vision 2050 research ; customers show mixed levels of interest in this area. Although some are keen for more wild spaces to improve local areas and provide safe spaces for families, others feel it has a lower priority and, given the utility bills crisis, wouldn't be the right area to invest in currently compared with core service areas.</p>

Sources:

[1] What Customers, Communities and Stakeholders Want v18, Sia Partners, September 2023

[2] Ofwat + CCW customer preferences research, April 2022

[3] PR24 Deep Dives, February 2022; Enhancement case package options research, September 2022; Enhancement case deep dive research, May 2023

[4] Thames Water WRMP Consultation, May 2023; WRSE – Customer Preferences to Inform Long-Term Water Resource Planning, March 2021; WRSE Best Value Criteria, May 2021; WRSE Water resources quantitative research, June 2022

[5] Acceptability and Affordability Testing (Qualitative findings), May 2023

[6] Vision 2050 Research, May 2022



