Anglian Water: PR24 Cost Change Proposal

Gravity Sewers

1 May 2026

Cost Change submission 2026 Gravity Sewers

Cost Change 2026

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1 Overview of cost area proposal

Gravity sewers are a critical part of the wastewater system, underpinning the safe removal of sewage and protection of customers, communities and the environment. While largely unseen, their failure has immediate and serious consequences, including sewer flooding, pollution incidents and service disruption.

Our analysis shows that the condition of gravity sewers is deteriorating and that current levels of investment are not sufficient to stabilise long-term asset health. Historic renewal rates have averaged approximately 0.04% per year, far below the level required to maintain a sustainable asset base. As a result, deterioration is accelerating, reactive interventions are increasing, and risks to customers and the environment are rising.

Without additional investment, we expect:

- increasing sewer collapses and asset failures;
- rising levels of sewer flooding and pollution risk; and
- higher long-term costs driven by reactive maintenance and emergency response.

This demonstrates that the current position is not sustainable and that delaying intervention would lead to poorer outcomes for customers and higher costs over time.

We have responded to Ofwat's request to survey a representative sample of sewers by requesting an additional allowance, and welcome Ofwat’s intent to improve asset condition information. We consider this activity to be an integral part of establishing a sustainable rate, rather than a one-off exercise.

Why investment is required now

This proposal represents a targeted first step to address the highest-risk assets within the existing backlog and to begin transitioning towards a sustainable level of renewal ahead of PR29.

The Cost Change process is the appropriate mechanism to address these risks, as recognised by the CMA, which confirmed that emerging asset health issues should be addressed through in-period processes rather than deferred within the PR24 settlement. Acting now enables early risk reduction, avoids further deterioration and supports a smoother investment profile for customers over the longer term.

Our proposal

We are proposing £20.2m of additional capital investment to proactively rehabilitate 8.78 km of poor-condition (Grade 5) gravity sewers in the highest-risk catchments during AMP8.

This targeted programme:

- focuses on assets with the greatest likelihood and consequence of failure;
- prioritises catchments with the highest risk of flooding, pollution and environmental impact; and
- complements base maintenance activity, which continues to fund routine and reactive work.

The programme is deliberately focused on the highest-risk assets, ensuring that investment delivers the greatest possible benefit to customers and the environment per £ invested.

The second part of our proposal is for additional funding for operational costs for proactive, intrusive CCTV sewer surveying for 0.5% sample rate requirement (£11m).

Given the distinct nature of these two investments, we have set out the evidence supporting the investment into two parts. Part A supports the request for increased capital maintenance and part B supports the request for proactive intrusive CCTV survey, including setting out the detailed technical information on how we have selected the sewers for survey.

Table 1 Investment summary

Investment[a]	Expenditure type	2027/28	2028/29	2029/30	AMP8
Capital maintenance	Capex	5.0	8.8	6.4	20.2
Ofwat CCTV survey	Opex	2.2	4.4	4.4	11.0
	Totex	**7.2**	**13.2**	**10.8**	**31.2**

a Wastewater Network+ price control, £m, 2022/23 price base

Table 2 Summary of benchmarking and customer protection

Benchmarking	
Method	Cost efficiency was assessed by benchmarking gravity sewer activity against internal historic outturn data and relevant external references (including TR61 where applicable), with comparison undertaken at final intervention level and, where appropriate, by construction technique. Benchmarking considered unit rates, programme scale, procurement route, and delivery context, with variances tested against identifiable cost drivers.
Findings	Trenchless relining activities account for 70% of our assumed length of gravity sewer rehabilitation. A direct comparison with TR61 shows our costs to be efficient, with our cost change proposals costing 16% less than the TR61 benchmark. For open-cut works, there is no comparable direct cost benchmark available. We have benchmarked by building historical outturn costs into the cost build-up of these schemes, using the same approach as that used to develop our PR24 enhancement costs which were assessed by Ofwat as being efficient.
Customer protection	
Price control deliverable	We include a PCD to cover the £20.2 million allowance for the proactive renewal of 8.78 km of poor-condition gravity sewers in high-risk catchments in AMP8. The PCD will measure the % of this allowance spent by the end of the AMP, with independent annual ex-post assurance, and a clear mechanism to return funding to customer where agreed conditions and outputs are not met. In addition, we propose a PCD covering the proactive CCTV survey of 367 km of gravity sewers in AMP8. We propose a unit-rate based, end-of-period PCD with clear conditions requiring MSCC5-compliant surveys aligned to Ofwat's methodology cohorts, ensuring customers only pay for delivered inspection activity.

1.1 Context of our proposal

Asset health is critical

Water and wastewater infrastructure underpins all aspects of service delivery, including environmental performance, resilience and economic outcomes. Maintaining asset health is therefore a core responsibility, alongside the provision of safe, clean drinking water.

Gravity sewers are fundamental to this. They form the backbone of the wastewater system, conveying sewage safely away from homes and businesses. While largely invisible in operation, their failure has immediate and severe consequences, including sewer flooding, pollution and disruption to customers.

Our approach to asset management

Asset stewardship is a key focus for our business. We were one of the first companies in the world to achieve ISO55001 Asset Management Standard, and Ofwat's 2021 AMMA analysis, assured by Arup, identified Anglian as the highest scoring company for asset management maturity in the sector.[1]. In 2024, we proactively developed an Asset System Resilience Appraisal (ASRAP). The ASRAP is an in-depth holistic review of our entire asset base that uses advanced digital tools, including a predictive analytics module, to forecast our long term asset needs and is a robust foundation for the new approaches being discussed for PR29, particularly NARM.

For gravity sewers, ASRAP confirms that deterioration is progressive and accelerates once defects emerge, particularly where assets are exposed to groundwater ingress, ground movement and hydrogen sulphide corrosion. As condition worsens, failure risk increases non-linearly and reactive intervention becomes less effective and more disruptive.

Ofwat's current approach to capital maintenance allowances

We have long been concerned that Ofwat's current approach to setting capital maintenance allowances, based on backwards looking econometric models, has resulted in persistent and significant underfunding and driven short-term, reactive 'fix on fail' management strategies. This is not sustainable for long-lived asset classes such as gravity sewers.

1 Anglian Water, March 2025, PR24 CMA Redetermination Statement of Case, pages 84 and 85

Not only is this a deep concern to our customers, it is also undermining the sector's ability to attract essential investment, as leaving companies without funding to maintain assets produces disproportionate, unfunded risks that contribute to the equity challenge facing the sector.

Given the importance of this issue we have been active in advocating for a change of approach, for example, in our 2007 Strategic Direction Statement, at the CMA in PR19, the development of PR24 methodology, and again at the CMA in PR24.

Our concerns are now widely shared. The need for an alternative approach has been recognised by multiple organisations, including the CMA at PR19[2] and the National Infrastructure Commission[3]. Both Scotland and Northern Ireland's water regulators have taken action to reform their approaches. More recently the IWC concluded that 'the current regulatory approach to infrastructure resilience is not adequate'[4] and recommended the development of statutory resilience standards to 'drive the action and funding necessary to ensure these assets are fit for the future[5].

What is a sustainable level of capital maintenance spend?

As noted by the IWC, the sector does not yet have a clear idea of what a sustainable level of capital maintenance spend would be, despite the broad consensus that it needs to increase.

Our analysis indicates that a materially higher rate of gravity sewer rehabilitation is required to stabilise asset condition over time. This will require investment significantly above current base allowances.

In addition to these structural funding constraints, our region presents specific asset health challenges. The East of England's low-lying and coastal geography, with high groundwater levels and a significant proportion of shrinkable soils, increases susceptibility to ground movement, infiltration and structural deterioration. Approximately one quarter of the region lies below sea level, further exacerbating these risks.

We also face elevated septicity risk due to the prevalence of pumped systems in a flat network. Retention of sewage in rising mains leads to hydrogen sulphide formation, which in turn generates sulphuric acid. This accelerates corrosion in concrete and metallic assets, particularly at discharge points, resulting in premature deterioration and increased likelihood of collapse.

While these regional factors intensify risk, the underlying challenge is not unique to Anglian Water. Across the sector, gravity sewer renewal rates remain very low, reflecting a broader systemic issue [6]. At PR24, Ofwat recognised the need to establish sustainable renewal rates for water mains, estimated at 0.8-1.1% per annum. A similar approach is required for wastewater assets.

Our analysis demonstrates that a gravity sewer renewal rate in excess of 0.25% per annum is required to stabilise asset condition over time, significantly above current run rates. Without this step change, asset deterioration will continue, leading to increased failure rates, higher reactive costs and worsening outcomes for customers and the environ

Our 2026 cost change proposal represents a targeted first step towards this position. It focuses on the highest-risk assets within the existing backlog, prioritising poor-condition sewers in catchments with the greatest customer and environmental impact. This approach delivers immediate risk reduction while remaining deliverable and affordable within AMP8.

The role of Ofwat's Asset Health Roadmap and Cost Change process

Despite the urgency of the asset health concerns across the industry, Ofwat's Asset Health Roadmap was introduced relatively late in the PR24 process. Given the lack of certainty at that time about how the Roadmap would lead to additional funding, we and the other disputing companies raised the need for additional base allowances as part of our case to the CMA during the PR24 redeterminations. Against the backdrop of the Independent Water Commission and the growing expectation of significant future reform in this space, the CMA decided that it would not be appropriate to address asset health concerns through the redetermination,

2 At PR19 the CMA called for Ofwat to develop forward-looking asset health metrics
3 See NIC, Developing resilience standards in UK industry (September 2024), page 9
4 IWC, July 2025, Final Report, page 382
5 IWC, July 2025, Final Report, page 8
6 PR24 Draft Determinations - Expenditure Allowances, p.33

noting instead that these issues are better considered through Ofwat's asset health roadmap and in-period reopeners. The CMA therefore focused its assessment on defined individual claims and modelling issues, rather than undertaking a broader reassessment of underlying asset health needs during AMP8[7].

The Cost Change process should be viewed within the long-term trajectory of increasing investment requirements, and as such it is an opportunity to both bring forward investment and smooth bill increases for customers over a longer period. During the cost change process Ofwat will need to balance short-term affordability concerns against the longer-term risks to asset resilience and increased operational failures. We urge Ofwat to place appropriate weight on the longer-term context in its decision, and explicitly consider how its decision may impact upon future customers.

7 Final decision summary and volume 1 para 4.176

Part A:
Gravity sewers – capital maintenance

1 Need for additional investment

1.1 Introduction to need for additional capital maintenance

Ofwat assessment criteria: *historical investment and how risk and asset health has changed over time, to underpin the 'as is' position. If historical health or risk data is not available, an explanation of how the assets have been managed should be provided*

We operate one of the largest sewer networks in the sector, comprising approximately 73,000 km of sewers, and 1.2 million manholes. Whilst we have strengthened our monitoring capability over the last AMP, including in sewer and rising main monitoring, our Asset System Resilience Appraisal (ASRAP) demonstrates that current renewal rates are insufficient. The ASRAP forecasts that, without increased proactive intervention, collapse rates and infiltration and associated risks will continue to increase[8].

We currently invest c. £40 million per year on our sewerage network covering gravity sewers and ancillaries such as manhole cover replacements. However, this funding is increasingly absorbed by reactive maintenance, leaving limited headroom for the proactive renewal required to manage long-term asset health.

Our PR24 Plan, supported by the ASRAP, clearly identified the need for increased maintenance funding for gravity sewers [9]. At that time, we did not submit a Cost Adjustment Claim (CAC) for these assets, recognising the high evidential threshold and instead sought a broader uplift to base allowances with flexibility to deploy funding to the highest-risk asset classes[10].

The PR24 Final Methodology required companies to demonstrate a unique need not captured by econometric models, creating a high evidential bar for CACs[11]. As a result, these risks have continued to be managed within base allowances, leading to a position where reactive activity increasingly dominates over proactive renewal.

8 See ASRAP Section 1.2. page 33 gravity Sewers
9 Our PR24 Business Plan. Figure 13 page 81
10 Anglian's Draft Determination Representations page 28
11 Ofwat, PR24 FD Expenditure Allowances, page. 28

In addition to these structural funding constraints, our region presents specific asset health challenges. The East of England's low-lying and coastal geography, with high groundwater levels and a significant proportion of shrinkable soils, increases susceptibility to ground movement, infiltration and structural deterioration. Approximately one quarter of the region lies below sea level, further exacerbating these risks.

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While these regional factors intensify risk, the underlying challenge is not unique to Anglian Water. Across the sector, gravity sewer renewal rates remain very low, reflecting a broader systemic issue (PR24 Draft Determinations - Expenditure Allowances, p.33). At PR24, Ofwat recognised the need to establish sustainable renewal rates for water mains, estimated at 0.8-1.1% per annum. A similar approach is required for wastewater assets.

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1.2 What base buys

Ofwat assessment criteria:*an assessment of 'what base buys' to provide confidence that the requested additional investment is to address risk above and beyond what existing base expenditure allowances cover*

1.2.1 Why a Cost Change Is needed

From our operational experience, it is clear that:

- PR24 base allowances are insufficient to fund a sustainable level of proactive rehabilitation
- As a result, reactive activity now dominates, crowding out proactive rehabilitation
- The growing backlog of critical issues cannot be addressed within base
- Customer and environmental risks are rising due to deteriorating asset condition

Therefore, additional funding is required to:

1. Address the high impact Grade 5 assets not funded through base
2. Stabilise long term deterioration pathways
3. Reduce pollution and flooding risk
4. Support WRC compliance through infiltration reduction
5. Move towards a more sustainable rate of sewer rehabilitation

The requested cost change ensures customers do not pay twice: base continues to fund routine activity, while the cost change funds only the incremental, risk driven, above base need.

1.2.2 Implicit Allowance Results

Ofwat requires companies to demonstrate clearly and transparently what is funded within existing base allowances to ensure customers do not pay twice for the same activity. For gravity sewers, this means distinguishing between:

- Activities that should already be funded through PR24 base expenditure, and
- Additional activities that address risks beyond what base allowances were designed to cover.

Our approach follows Ofwat's Asset Health Cost Change Guidance and reflects the dual methodology that Ofwat expects companies to use when determining Implicit Allowances (IAs). A description of the approach we have taken is set out in Appendix 1 What Base Buys technical appendix.

A summary of the IA results for AMP8, expressed in 2022/23 Price Base is set out below. Three broad categories of approach, an econometric and a mean and a median average approach have been summarised and an overall triangulated figure shown. We also show our per AMP spend over the last ten and the last five years.

Table 3 Implicit allowances for AMP8

	Econometric	Mean	Median	Triangulated Central Estimate	Anglian total historic spend per AMP	
					Based on 10 years data	Based on most recent 5 years
Gravity sewers[a]	200.0	216.8	206.3	207.7	210.5	209.2

a £m, 2022/23 Price Base

1.3 Risks associated from current 'as is' asset health position

Ofwat assessment criteria: *identified risks posed to service or the environment as a result of the asset's current health. Where there is no historical precedent, companies should use expert judgement to determine risk*

The current condition of gravity sewers presents material and increasing risks to customer service and the environment, primarily:

- Pollution risk: Structural deterioration, collapses and partial collapses increase the likelihood of blockages and restricted capacity, contributing to pollution incidents from the foul network and storm overflows.
- Internal and external sewer flooding: Failures in structurally poor assets, particularly Grade 5 sewers, can directly trigger internal and external flooding, curtilage flooding, and wider network surcharge also resulting in loss of service to customers. Approximately 30% of flooding incidents are related to asset failures, and the reactive work associated with these

incidents (e.g. tankering and pumping costs) increases costs year on year as reactive demands increase.

- Deterioration driven hydraulic loading and infiltration: A significant proportion of our region is inherently vulnerable to groundwater ingress, with around 50% underpinned by groundwater and approximately one third located within high risk flood zones. This elevates the likelihood of water entering the sewerage system, particularly where ageing or damaged assets are present. Higher groundwater infiltration into compromised networks increases inflow to downstream WRCs, creating:
  - volumetric compliance risk at water recycling centres and pumping stations, increasing the risk of DWF non-compliance and discharging to storm overflows.
  - reduced process stability, and
  - increased use of storm storage and overflows.

Given the scale and structural nature of this risk, these service and compliance impacts cannot be mitigated through reactive activity alone. They form a core part of the incremental risk driven by regional hydrogeology and flood exposure, which is not funded within base allowances.

1.4 Forward View of Risk

Ofwat assessment criteria: *forecast of future asset health, how health and risk will change over time showing a change in quantified risk requiring a step-change in asset investment. If quantified risk information is not available, qualitative risk information and expert judgement should be used.*

Our ASRAP represents a rigorous bottom-up and forward-looking assessment of asset risk. Our approach follows Ofwat's expectation that deterioration models should be based on robust historic data and relevant asset features.

ASRAP methodology includes:

- Segmentation of the entire 73,000 km gravity sewer network into ~50 metre lengths for asset level modelling.
- Statistical analysis of historic failures to derive deterioration curves.
- Use of material, age, diameter and sewer type (foul / surface water) as model variables.
- Condition forecasting over 50 years, generating predicted failure rates for each asset.
- Integration of hydraulic modelling and geospatial consequence analysis to determine:
  - flooding impacts,
  - pollution likelihood,
  - activation of storm overflows, and
  - knock-on effects on upstream/downstream assets.

Our models align with deterioration research from other UK and international sewer authorities, including observed accelerated corrosion in concrete assets exposed to hydrogen sulphide[12] which explains why some sewer classes experience faster structural decline than others.

1.4.1 Current Renewal Rates Demonstrate an Unsustainable Position

Having established the likelihood of failure (collapse), we then use hydraulic models and geospatial systems to predict the consequence of failure, such as flooding or pollution likely to be caused by partial or total sewer collapse. This includes for example activation of upstream sewer overflows. We can then combine the risk (likelihood x consequence) with the cost of renewal to run investment optimisation scenarios for different sums of capital maintenance to mitigate deterioration.

Historical renewal rates across our region have been extremely low, averaging 0.04% per year over the past eight years. This implies an expected asset life exceeding 2,000 years, far beyond any sustainable or realistic replacement cycle for a buried, ageing asset class subject to ground movement, infiltration and sulphide corrosion.

Table 4 Historical renewal rates

	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Length rehabilitated (km)	45	29	32	16	33	26	18	20

12 For instance German water authorities have also found concrete sewers to fail faster than plastic or clay sewers due to the presence of hydrogen sulphide in sewer systems which corrodes concrete assets,

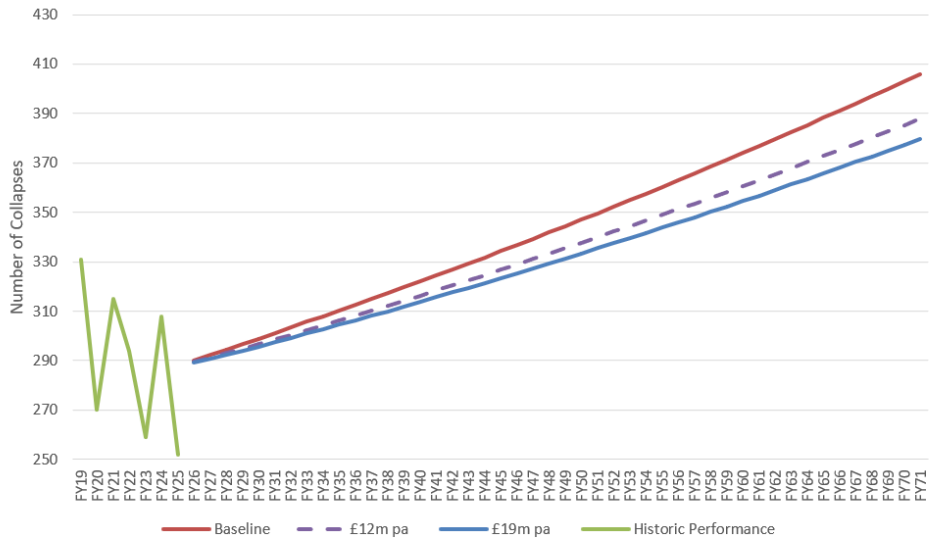
	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Total length of gravity sewers (km)	71942	72031	72281	72369	72369	72440	72890	73342
% replaced	0.06	0.04	0.04	0.02	0.05	0.04	0.02	0.03

These levels of renewal are significantly below those required to stabilise deterioration, and even further below the levels needed to improve long-term asset health.

1.4.2 Forecast future asset health under current renewal levels

The ASRAP risk assessment shows that without a material increase in proactive renewal, the condition of gravity sewers will worsen materially, increasing by a factor of roughly a third over 50 years. as deterioration accelerates. This reflects the long-term consequences of ageing materials, historical installation practices, and increasing environmental pressures (e.g. groundwater infiltration and ground movement).

Figure 1 Number of coliform bacteria tests not meeting the standard for service reservoirs in England and Wales



The collapses projection graph from our ASRAP compares three scenarios over a 50 year outlook:

- Baseline (red line) - no increase in proactive rehabilitation
- Residual number of collapses based on proactive rehabilitation of £12m/year (purple dashed)
- Residual number of collapses based on proactive rehabilitation of £18.8m/year (blue)
- Historic performance (green) - actual observed variability in sewer collapses

Across all scenarios, collapse numbers increase steadily, with the steepest trajectory under the Baseline. Even under the improved AMP8 level of activity, collapse volumes continue to rise, demonstrating that current renewal rates will not stabilise system risk.

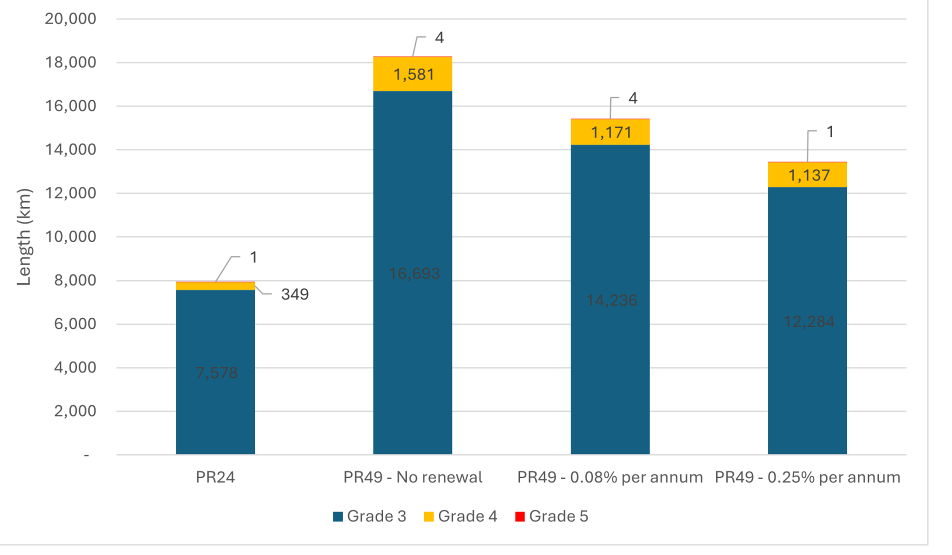
This reinforces the need for additional, targeted capital maintenance to slow the growth of high risk assets.

Gravity sewers represent the single largest Gross Modern Equivalent Asset Value (GMEAV) asset classes within our asset base, accounting for over half of the total replacement value of our assets. As highlighted by the National Audit Office[13], deferring investment in large, long-life underground assets leads to significantly higher costs and poorer service outcomes for future customers. Therefore, neglecting to maintain this system will have costly impacts on future generations.

As part of PR24, Ofwat gathered condition grade data for sewers and compared it with PR09 condition data. Following the precedent of illustrating the effect of underinvestment in capital maintenance for water mains, we have produced this graph showing projected condition grade splits in 2050 based on AMP8 run rates of replacement. The shown projections for PR49 correspond to baseline deterioration with no proactive programme (the red line in the graph above), £19m per year of proactive rehabilitation, equivalent to 0.08% per annum of the network (the blue line in the above graph), and a third scenario at £60m per year equivalent to 0.25% per annum (not shown on the graph above):

13 Regulating for investment and outcomes in the water sector

Figure 2 Length of Gravity Sewer in Condition Grades 3-5 (using modelled data)



This clearly shows the need for increased investment in renewals over a sustained period throughout AMP8 and beyond AMP12, since even the highest level of investment at £60m per year still sees deterioration compared to PR24, with more lengths moving into grades 3, 4 and 5.

If proactive renewal is not increased above current levels, the consequences include:

- More collapses, driving increased reactive costs
- Higher pollution risk, especially following structural failures
- More internal and external sewer flooding
- Increased frequency of storm overflow spills
- Greater infiltration, placing pressure on WRC volumetric and quality compliance
- Impact on CMEX and license G commitments / expectations

This growing risk profile directly affects customer outcomes and environmental performance.

For this specific proposal, we have combined this overarching strategic risk assessment with operational knowledge of existing issues in our network. We intend to use the cost change allowance to address these complex priority issues (which inherently come with a higher unit cost than planned proactive projects over long lengths of relining), requesting a flexible allowance giving us the option to substitute lengths as new, higher priority, issues are discovered.

1.5 Strategic alignment

Ofwat assessment criteria: *alignment to long-term asset class strategies that demonstrate why the future is different from the past for the priority asset type, and why the investment is required now. For example, evidence that the asset is posing a greater risk in the future due to asset deterioration. Future uncertainties are taken into account for example. climate change impacts*

This investment proposal is fully aligned with our long-term sewer asset class strategy, which recognises that the future risk profile of the network is fundamentally different from the past. Our strategy shows clear evidence of accelerating asset deterioration in both small and large diameter sewers, compounded by ageing materials, historical construction methods, and increasing loads on the system. Without timely intervention, these factors are expected to drive a greater likelihood of collapses, blockages, pollution events, and customer flooding. This demonstrates why investment is required now, rather than deferring risk into later AMP periods.

Future uncertainties, including climate change, higher peak rainfall intensities, increasing infiltration associated with rising water table resulting from capping of groundwater abstraction licences, long term urban growth, and observed trends in urban creep have been incorporated through scenario planning. This ensures the proposed strategy remains resilient across a range of future states and supports Ofwat's expectation that investment decisions must be justified in a forward looking context.

The prioritised programme, including targeted reline/replace ratios and risk-based asset selection, is directly traceable to the long-term strategy. It provides a clear line of sight between our strategic intent, the evidence of emerging risk, and the specific investment being requested for PR29.

This aligns with Ofwat's requirements by ensuring that the strategy, rationale, and timing of investment are coherent, transparent, and future focused.

This investment is completely separate, from a funding perspective, to the proposals we are undertaking in response to the Flow Undertakings, specifically the £57m being spent in at least 8 catchments to remove excess flow. Any insight gained from investigations for our Excess Flow Management Plan and from these proposals will be shared and used to further enhance our understanding of our network.

1.6 Stakeholder engagement

Ofwat assessment criteria: *engagement with stakeholders, where appropriate (e.g. Environment Agency and local authorities)*

Our proposed investment has been shaped through a structured programme of engagement with key regulators and stakeholders, ensuring alignment with Ofwat's expectation that a step change in asset health investment is developed collaboratively and with transparency. Throughout early 2026 we held a series of technical workshops and bilateral discussions with Ofwat to test assumptions, share evolving risk evidence, and discuss our approach to gravity sewer deterioration and CCTV surveillance. These sessions included focused discussions on Ofwat's documented position that routine sewer CCTV may be treated as opex where it supports ongoing monitoring and risk identification, and we have reflected this understanding within our investment design.

We met the Environment Agency three times, 12th February, 1st March 2026 and 22 April, to walk through the proposed programme. The EA's feedback centred on ensuring that asset health activity does not adversely affect EA regulated outcomes and reinforced the need to address sewer related asset health issues proactively.

2 Best option for customers

2.1 Optioneering

Ofwat assessment criteria: *a set of potential credible options over a range of intervention types to meet the identified need.*

We have applied a structured and evidence-led optioneering approach to identify the most efficient and effective sewer rehabilitation interventions, consistent with Ofwat's Asset Health and Gravity Sewers assessment guidance.

2.1.1 Long list development and screening

We developed a comprehensive long list of technically feasible interventions spanning the full range of rehabilitation approaches, including:

- Full excavation and replacement (open cut, pipe bursting, directional drilling)
- Structural rehabilitation (CIPP lining - hot water and UV cured, slip lining)
- Localised repairs (resin injection, patch lining, manhole sealing)
- Non-structural interventions (infiltration reduction, joint sealing)

This long list was informed by operational teams, asset specialists and delivery partners, ensuring it reflects real-world constructability and delivery constraints.

Options were then screened using a structured decision-making framework considering:

- Technical feasibility (including asset condition, depth, diameter and access constraints)
- Whole life cost
- Delivery risk and safety
- Customer and environmental impact (including disruption and pollution risk)

This results in a constrained set of credible options for each intervention.

While reactive failures can limit real-time optionality (e.g. collapse requiring urgent reinstatement), this framework ensures that even in constrained scenarios, the selected solution represents best overall value.

2.1.2 Strategic optioneering

At a programme level, we assessed two principal delivery strategies:

- Option 1: Maximise total length rehabilitated in lower-risk locations
- Option 2: Target high-risk and high-impact catchments

Our assessment demonstrates that Option 2 delivers superior whole-life value, as it:

- Prioritises reduction in flooding, pollution and service failure risk
- Targets assets with highest consequence of failure
- Aligns directly to performance commitments relating to pollution and customer outcomes

This approach is consistent with our previously submitted methodology in the October Gravity Sewers - All Company Query (notably Questions 5 and 7).

2.2 Robust decision making

Ofwat assessment criteria: *robust decision making and robust whole life cost-benefit appraisal that clearly shows best value for customers, the environment and long-term asset health to inform the selection of the proposed solution(s)*

2.2.1 Risk-based prioritisation

We prioritise interventions using a risk-based framework that assesses:

- Likelihood of failure (condition, repeat history, operational data)
- Consequence of failure (customer impact, environmental harm, network criticality)

This is applied at a local network level, using:

- CCTV condition data
- Historical performance (including repeat incidents)

- Operational and sensor data (e.g. sewer level monitors)
- Field intelligence from reactive inspections

This ensures interventions are targeted where they provide the largest reduction in environmental and customer impacts. We use historical performance (repeat issues and consequences), operational/sensor data and our value framework to target work that delivers the greatest value against our performance commitments. Repeat frequency is weighted and can be flexed to reflect local business drivers and asset owner needs.

Evidence base and understanding of condition

We use targeted CCTV inspection to maintain and improve our understanding of asset health, deliberately focusing on areas where we expect poor condition; this can result in a high proportion of inspected lengths being recorded at condition grade 5. We observe weak correlation at local level between condition grades reported in PR24 data tables (CWW21) and those observed via CCTV, reflecting differences in how surveys are recorded and coded and the risk of rapid deterioration between inspections. Investigative surveys following customer visits are documented alongside recommended interventions and are increasingly used to inform proactive delivery.

To strengthen our view of condition, we increasingly use information collected by field teams when responding to customer calls. Although these surveys are mostly uncoded, they record observed condition and recommended interventions and can be visualised geospatially. Over time this builds local asset intelligence, supports trend identification and informs where to commission coded surveys and/or progress interventions within the capital programme.

We are also working closely, internally, with the teams undertaking the surveys of 45 catchments to identify which catchments to target for removal of hydraulic overload in response to the September 2025 Flow Undertakings

Intervention selection (reline vs replace)

To deliver best value for customers, we adopt a rehabilitate first approach, applying a 70% reline / 30% replace ratio for sewers under 600 mm, and 100% relining for larger assets. This maximises cost efficiency across what is inherently a high volume, low unit value programme, while ensuring that replacement is reserved only for locations where structural condition or hydraulic requirements make relining unfeasible.

Relining is the default intervention where technically feasible and cost-effective.

Our preference for relining is because:

- Lower unit costs, reduced disruption to customer and highway users, and reduced safety risk associated with trenchless methods
- The ability to maximise coverage within funding constraints
- Evidence from delivery experience on where relining is technically viable

Relining options include:

- Relaying/replacement (including pipe bursting or directional drilling)
- Structural relining (pipe insertion/slip lining, CIPP lining)
- Re-rounding and relining of pitch fibre pipes
- Manhole sealing/spray lining
- Resin injection/sealing
- Cured-In-Place Pipe (CIPP) relining or sliplining) includes hot-water cured and UV cured liners. These techniques can still require some excavation and reinstatement, and a material cost driver is the need for temporary over-pumping or tankering to manage flows during works.

Replacement is selected where structural condition, geometry, access, depth, service connections or hydraulic constraints mean relining would not provide the required outcome

2.2.2 Key risk themes

Pitch fibre sewers (transferred network): collapses are a known issue. Where repairs are triggered, we would ideally survey upstream and downstream to proactively identify and rehabilitate the worst assets installed as part of the same legacy network. Within current funding allocations, we generally rehabilitate the known failing section until sufficient evidence and repeat history supports extending the intervention.

Concrete sewers - hydrogen sulphide (H_2S) corrosion: we have experienced high-complexity failures driven by H_2S corrosion. Identifying and coding these defects requires specialist skill because cracks may not be visible;

loss of cross-sectional area and exposed aggregate are key indicators. We will continue to prioritise high-risk lengths where possible, as repairs can be deep and costly (in some cases >£1m for a single collapse) with associated pollution and flooding risk.

Consistent with information provided to both Ofwat and the CMA, we intend to focus additional capital maintenance on poor condition sewers in high groundwater areas to improve condition and reduce infiltration. AMP7 base allowance investment in sewer level monitors enables improved identification of high infiltration locations. In selecting solutions, we will balance structural renewal with measures that address infiltration pathways (including manholes and pipe-to-manhole joints).

2.2.3 Programme selection and optimisation

Using historic CCTV survey data we identified, an initial population of:

- 750 km of Grade 4 and 5 sewers
- Refined to 202 km of Grade 5 (highest likelihood of failure)

Given deliverability and financeability constraints, we have prioritised a subset of this population by selecting condition grade 5 sewers in the catchments with the highest risk of infiltration. Almost all known condition grade 5 sewers in the top four highest risk catchments have been included.

This results in a programme of sewers totalling 8.78 km in length

2.3 Details of the proposed solution

Ofwat assessment criteria: *the proposed solutions, including scale and timing of the investment. Including how it meets customer preferences*

The outcome of the optioneering and wholelife appraisal process is a targeted, risk based programme of investments to be delivered during AMP8. The proposed enhancement programme:

- Targets 8.78 km of grade 5 sewers in the catchments with the highest risk of infiltration
- Complements base maintenance activity funded through WN+ allowance
- Focuses on catchments with the greatest customer and environmental impact

Our base programme (c. 32.8 km/year at ~£1.26k/m) addresses ongoing deterioration, while this enhancement programme:

- Accelerates intervention in critical locations including 8.78 km of Grade 5 sewers
- Reduces risk of collapse, flooding and pollution
- Delivers early benefits in AMP9

The programme is phased to deliver early benefits in AMP9, targeting the catchments with the greatest customer and environmental impact.

We have used a prioritised list of potential candidate sewers to inform the scale and distribution of the investments, with each length of sewer assessed to consider:

- The benefits of replacement referring to known pollution, flooding and catchment issues
- The costs of replacement/relining by considering the surface type, depth and diameter

The scope of the proposed programme includes sewers with diameters from 100mm to 800mm, depths of up to 6m, and a variety of surface types including road, path and verge.

2.4 Benefits of the proposed solution

Ofwat assessment criteria:*what additional benefits the proposed solution will provide compared to the current situation, with clarity on the assumptions underpinning the cost benefit analysis (CBA)*

The proposed investment addresses key service risks that can affect environmental performance, and customer experience. By prioritising sewer rehabilitation in catchments with high levels of infiltration, the proposal is expected to improve the integrity and reliability of the wastewater network over time. This in turn will help to mitigate the risk of uncontrolled discharges during adverse conditions. This helps to protect the environment, and enhances operational resilience, particularly during high rainfall.

Targeted rehabilitation is also expected to lower the risk of internal and external flooding by mitigating hydraulic overload within the system. These improvements will contribute towards a more resilient network, reducing disruption to customers, and decreasing the need for reactive interventions. Investment in areas with borderline Water Recycling Centre (WRC) compliance headroom supports more stable flows and process performance, supporting long-term compliance and improving asset life.

The cost-benefit analysis is based on reasonable expectations of how reduced infiltration will reduce operational risk, informed by historical performance and engineering judgement. Overall, the proposal delivers a proportionate and targeted response to known risk, supporting sustained resilience and customer outcomes beyond the current situation.

2.5 Customer engagement

Ofwat assessment criteria: *customer engagement to understand customer preferences for final options where appropriate*

Customer engagement provides strong and consistent evidence that investment in gravity sewers aligns with customer priorities, particularly where it reduces pollution, prevents flooding and improves long-term network resilience. Across all sources, customers show a clear preference for proactive investment that prevents failure at source, rather than reactive or short-term responses. The State of the Nation Survey 2026 can be found at ANH-CC26-07, targeted Online Community research (March 2026, ANH-CC26-08), and wider PR24 customer engagement[14].

2.5.1 Customer priorities - core services, resilience and environmental protection

The State of the Nation Survey 2026 (sample size 1,245) provides a robust regional evidence base on customer priorities in the context of growth, infrastructure pressure and environmental risk. While customers' broader concerns are dominated by national and global issues, expectations of Anglian Water are clearly focused on delivering reliable core services, maintaining infrastructure and protecting the environment.

Concern about sewage pollution is both material and increasing, with 59% of customers rating stopping sewage discharges to rivers and coastal waters as highly important (8-10 out of 10), up from 48% in 2022. This demonstrates that pollution reduction is a growing regional priority, and reinforces expectations that companies should address the underlying causes through infrastructure investment.

14 Customer Synthesis Report

2.5.2 Customer preferences when making trade-offs

Targeted customer research provides clear evidence of how customers prioritise investment when faced with trade-offs. Gravity sewers are ranked as the second highest priority investment area, receiving 28 out of 100 points, ahead of power supplies and growth-related investment.

Customers associate gravity sewer investment with:

- preventing flooding and improving drainage resilience;
- reducing pollution and sewage overflow risk; and
- ensuring long-term reliability of the wastewater network

Notably, 26% of customers assign very high importance (60-100 points), explicitly describing gravity sewers as core system infrastructure. Customers consistently link sewer failure to immediate and visible impacts, including flooding and pollution incidents, demonstrating a strong understanding of the consequences of asset failure.

2.5.3 Preventative investment and alignment with proposed approach

Customers' rationale for prioritising gravity sewers is strongly preventative. Investment is supported where it:

- reduces the likelihood of service failure;
- avoids pollution events at source; and
- protects communities and the environment from disruption.

This aligns directly with our proposed approach, which targets poor-condition gravity sewers in high-risk catchments, focusing on assets with the greatest likelihood and consequence of failure. By prioritising these locations, the proposal reflects customer preferences for risk-based, high-impact investment that addresses root causes rather than symptoms.

2.5.4 Supporting qualitative evidence

Open-ended responses reinforce these findings. When asked about our future priorities, customers most frequently cite:

- infrastructure upgrades and maintenance;
- sewage pollution and water quality;
- environmental protection; and
- sewerage and drainage capacity .

Customers' own comments emphasise the importance of proactive investment:

> "Cleaner water and no sewage dumping"
>
> "Improving infrastructure, not profit"
>
> "Ensuring systems can cope before new housing is built"

These responses demonstrate that customers view pollution as a symptom of under-capacity and ageing infrastructure, and expect companies to invest in long-term solutions.

2.5.5 Wider context - trust and expectations

This regional evidence is consistent with national findings from CCW Water Matters 2025, which indicate low satisfaction with environmental performance and sewerage services, and declining trust in the sector. This reinforces the importance of visible, effective investment in core infrastructure to improve outcomes and rebuild confidence.

Taken together, the evidence demonstrates that customers:

- prioritise reliable wastewater services and environmental protection;
- support investment that prevents flooding and pollution at source;
- prefer proactive, preventative approaches over reactive interventions; and
- expect companies to address the root causes of service failure through infrastructure investment.

Gravity sewer investment therefore represents a customer-supported and evidence-based priority, aligned with customer preferences and Ofwat's expectations for targeted, risk-based asset health investment.

3 Robust and efficient costs

3.1 Costing methodology

***Ofwat assessment criteria:** the costing methodology and approach being applied to derive the cost of options and chosen solution*

The costing methodology for the Gravity Sewer Rehabilitation Programme has been developed to ensure that proposed costs are robust, efficient, transparent and auditable and that they proportionately reflect the scale and nature of the investment being requested The approach is designed to provide Ofwat with confidence that both the option appraisal and the preferred solution are costed using realistic assumptions grounded in delivery evidence, while retaining appropriate flexibility to support efficient programme-level delivery in AMP8.

The methodology recognises that gravity sewer rehabilitation is a high volume, repeatable and data rich activity, where value for money is best demonstrated through analysis of historic delivery performance rather than reliance on bespoke, scheme specific designs at the point of cost change planning. To reflect this, programme cost estimates for the delivery of the proposed 8.78km of highest priority gravity sewers are derived using predictive analytics, enabling costs to be estimated based on realistic intervention lengths and asset characteristics without overstating scope definition at an early stage.

Costs are therefore constructed using representative “virtual schemes of work”, rather than a fixed list of individual schemes. These virtual schemes reflect the statistical distribution of historic delivery outcomes, ensuring that unit rates and total costs are representative of what has been delivered in practice. This approach allows efficient optimisation of the programme during delivery and supports prioritisation of the highest risk assets as new information emerges during the AMP, consistent with Ofwat’s expectations for flexible, risk based asset health investment.

3.1.1 Calibration using historic delivery evidence

To develop cost estimates for the 8.78km of gravity sewers assumed for this cost change proposal, we have made a used AMP7 outturn data to inform the parameters of our cost modelling. Our costing methodology for the cost change methodology is explicitly calibrated using AMP7 outturn data. This reflects:

- the observed mix of sewer rehabilitation techniques (e.g. structural lining, replacement and localised repairs);
- typical intervention lengths achieved on site; and
- the relationship between key asset characteristics–such as diameter, depth and surface type–and outturn unit costs.

This calibration ensures that the cost estimates reflect proven delivery practice, incorporate the operational complexity associated with gravity sewer works, and demonstrate that the proposed costs represent efficient, achievable and industry credible values.

A key parameter driving the costs required for sewer is the type of intervention (e.g. relining or replacement) as this drives the activity required to make improvements to the sewer (i.e. whether open cut techniques are required, or whether the improvement can be made without the need for excavation). To establish the proportion of each technique that should inform our cost estimation, we start by considering the split observed in AMP7. The table below shows the historic split by year and across AMP7.

Table 5 AMP7 delivery profile

APR	2020-21	2021-22	2022-23	2023-24	2024-25	AMP7
Length (km)	16	33	26	18	20	113
Reline (%)	52	47	43	44	65	48
Replace/ refurbish %	48	53	57	56	35	52

This shows that on an average in AMP7, replacement to relining length had a ratio of approximately 48:52. In recent years however, we have made a targeted shift toward less intrusive techniques (where conditions allow). This is shown in part by the 65:35 split in 2024/25 and a similar split is observed in the first year of AMP8, trending toward a typical ratio of 70:30 in AMP8.

While the appropriate intervention technique is ultimately determined by the condition and grade of the sewer at the point of intervention, and therefore remains responsive to asset need. For the purposes of this proposal, we have assumed a 70:30 split of relining to replacement for our cost change submission, in line with our current expectations for the split in AMP8.

3.1.2 Use of cost models and historical evidence

Cost models underpin the estimation of the Gravity Sewer Rehabilitation Programme and have been developed using AMP7 outturn cost data. The models are calibrated using actual delivered costs from completed sewer rehabilitation interventions.

We have identified the key cost parameters which driver sewer rehabilitation expenditure as: the length of the intervention; sewer diameter; depth of the sewer; the surface type and; reinstatement requirements. These are the key independent variables in the cost model.

The cost models are grounded relationships between costs and these parameters as observed in the delivery of historic schemes, ensuring the modelled costs are based on evidence from delivery in practice.

All costs are developed by using our outturn costs in a consistent cost breakdown structure, ensuring that the estimates are complete and transparent. The methodology captures:

- Direct capital costs (construction and installation),
- Indirect costs (preliminaries, supervision, temporary works),
- On-costs and overheads, including project management, design, surveys and assurance,
- Escalation to the relevant price base 2022/23.

As the cost models are derived from realised outturn costs across a large population of interventions, they inherently capture the range of delivery outcomes experienced in practice, including variations in productivity, access constraints and execution risk. On this basis, no additional standalone contingency or uplift has been applied beyond the cost estimates.

3.2 Cost efficiency

Ofwat assessment criteria: *efficient costs for options and the chosen solutions; cost benchmarking, including comparison to historical outturn costs and external benchmarks, where available (for related/alike schemes)*

3.2.1 Benchmarking Methodology

The programme comprises two distinct construction techniques, each with materially different cost drivers. To ensure a fair and meaningful efficiency assessment, benchmarking has been undertaken separately by construction type, rather than applying a blended or average rate.

We split the benchmarking between relining and open-cut activity. We have built our cost estimates based on an assumed 70:30 split between these activity types i.e. 6.3km of relining, and 2.5km of open cut.

Benchmarking has been undertaken using:

- Internal historical cost data from completed schemes; and
- TR61 industry benchmarks as an external point of reference, where available.

Trenchless (Relining) Construction Benchmarking

For trenchless (relining) construction, benchmarking against historic outturn costs and TR61 demonstrates strong evidence of cost efficiency.

Figure 3 Reline asset direct cost benchmarked to industry WRc TR61 - length 6.3km

The benchmarked length of 6.3 km shows that the latest estimated costs (as reflected in the gravity sewers cost breakdown) are approximately 16% more efficient than the relevant benchmark.

This demonstrates that our costs for relining are lower than the TR61 external benchmark, and provides confidence that our proposed costs are efficient.

Open-Cut Construction Benchmarking and Cost Drivers

For benchmarking of open-cut gravity sewers activity, we sought data from TR61. However, whilst data is available for open-cut activity, we found that this was not able to provide a like-for-like comparison with our proposed cost change activity. This is because TR61 data includes cost information up to Q2 of 2020. Since this time, there have been a number of additional regulatory requirements added to this activity that were not required at the time of TR61 cost data collection. These include:

- Introduction and increased use of Ground Penetration Radar (GPR): GPR services are now routinely deployed to reduce the risk of utility strikes, improving safety and reducing asset damage, but increasing upfront investigation costs.
- Enhanced plant and equipment safety requirements: There has been greater use of advanced plant, such as excavators with human movement detection and proximity warning system and vacuum excavators, reflecting improved health and safety standards.
- Changes to supervision requirements: Health and safety regulations have driven a reduction in supervisor-to-operative ratios, necessitating increased supervisory resources on site.

Given these changes, any comparison of costs between our cost change proposal and the TR61 benchmark would be unable to distinguish between the costs associated with these additional requirements, and efficiency. On this basis we have not used the TR61 cost data to benchmark the efficiency of open-cut schemes.

Absent of external benchmarking data, we take assurance from:

- the use of outturn cost data;
- the evidence of efficiency of other parts of the cost change programme that use the same cost estimation approach (including relining);
- Ofwat's assessment on the efficiency of our enhancement costs at PR24 (built using the same system and processes as our cost change submission);
- the positive commercial assurance findings, on the efficiency of our open-cut gravity sewer costs.
- the higher proportion of lower cost relining compared to AMP7 that we have assumed in the overall gravity sewer rehabilitation proposal

We consider that the above provides assurance on the efficiency of our costs, absent of a direct cost comparator for open cut gravity sewer activities.

3.3 Cost breakdown

Ofwat assessment criteria: *proportionate cost breakdowns for each intervention type*

During the price review, discussions on both costs and PCDs emphasised the importance of ensuring that investment scope is packaged in a way that is deliverable. In practice, it is neither efficient nor realistic to rehabilitate many short, isolated pipe lengths across multiple locations.

Instead, greater value for money is achieved by grouping connected or co located lengths into a single deliverable scheme, enabling economies of scale and reducing disruption, mobilisation costs and overall unit rates.

In applying this approach, some sewer lengths of the same age and construction type may be included within a scheme even if they are not yet classified as Grade 5. These assets are likely to be approaching end of life and can be efficiently addressed alongside adjacent failing assets. This approach lowers the average cost per kilometre rehabilitated and improves delivery efficiency, while still targeting areas of highest risk.

As a result, the programme requires a degree of flexibility in asset selection and reporting, rather than a tightly prescribed list of individual assets or rigid eligibility criteria. This is consistent with Ofwat's expectations for risk based, adaptive asset health programmes and ensures that investment can be directed to the most cost effective and impactful interventions as delivery progresses.

The costs associated with this proposal are summarised in the table below.

Table 6 Summary of costs for capital maintenance element of our proposal

Investment	Title	Construction technique	NB (mm)	Depth (m)	Length (m)	AMP8 Capex £m
I048213	PR24 CC Gravity Sewers - high catchment risk	Reline	225		5,430	3.379
			300		792	0.662
			800		70	0.158
		Open cut	225	1	1,161	1.633
			225	3	902	9.043
			300	1	142	0.315
			200	5	111	1.815
			300	3	108	1.140
			300	5	62	2.085

The full, scheme level cost breakdowns underpinning the gravity sewer programme estimates are provided in the Appendix ANH-CC26-13. These include detailed asset level costs, and on costs for each individual scheme, ensuring full transparency and auditability of the submitted costs.

4 Customer protection

4.1 PCD - gravity sewers renewals

We accept the need for a PCD for this increased level of activity and provide our detail in ANH-CC26-17 PCD Technical Annex.

Our proposed PCD is designed using principles consistent with climate change resilience expenditure PCD (PCDWW32), incorporating learnings from the PR24 process and CMA redetermination. It is designed to provide strong customer protection, whilst recognising the practical realities of delivering complex, risk-based asset health programmes. The PCD is:

- conditional and flexible, with delivery assessed and assured at the end of the price control period; and
- focused on the specific outputs and funding associated with this cost change proposal.

We propose a PCD is based on the allowance spent on renewing gravity sewers in high risk catchments. Similar to the enhancement resilience PCD, this PCD adopts a 'use it or lose it' approach, whereby any allowance for gravity sewer renewals not spent by the end of the AMP is returned to customers.

This approach is appropriate given the nature of the proposed investment. The cost change programme is small in scale but high in impact, and differs materially from the wider base programme in both its proactive focus and targeting of high-risk assets.

The design of the PCD ensures that:

- the mechanism remains proportionate to the scale of the proposal; and
- we retain the ability to adapt the programme as new information emerges, ensuring investment continues to target the highest-risk assets and delivers maximum benefit to customers and the environment.

Programme benefits will be assessed in terms of reduced risk of sewer flooding, pollution incidents and storm overflow activation.

To ensure robust customer protection, the PCD includes:

- annual ex-post review, supported by independent assurance;
- confirmation that funding is applied to proactive renewal of priority assets in high-risk catchments, supported by appropriate condition evidence; and
- assessment that any changes to the programme continue to deliver equivalent or greater value for customers and the environment.

This approach aligns with the revised mains renewal PCD, which allows constrained flexibility while maintaining accountability for delivery.

Where delivery falls short of agreed conditions and outputs, funding will be returned to customers on a proportionate basis. No over-delivery incentive is proposed.

5 Investment delivery plan

5.1 Investment delivery plan

To fulfil our gravity sewers cost change programme there are two work packages: asset condition assessment, and a proactive maintenance programme. Overall deliverability risks are assessed as low. We will monitor progress and report transparently on the deliverability risks through the regular delivery plan and monitoring framework, with six monthly reporting to Ofwat, annual publication for all stakeholders and the associated annual independent assurance.

5.1.1 Delivery risks and mitigations

The deliverability risk of gravity sewer asset condition surveying has been considered in the light of it being named as a potential supply chain pinch point which arises from Ofwat requiring all companies to simultaneously increase the level of activity in condition assessment during AMP8. We recognise that there is limited CCTV capacity in the UK market. In line with our approach to PR24 risk mitigation, we propose to mitigate these risks through early discussion with supply chain. In recognition of the need for flexibility whilst committing to deliver, we propose customer protection through an end of AMP PCD and not being held to a specific profile of activity over 2027-2030.

Our proactive sewer maintenance programme is a small but important step up in activity and delivery risks relate to both contractor capacity and network access constraints, such as traffic management which are in demand for other areas of work such as mains renewal. Our existing AMP8 programme is being delivered by supply chain providers who are supporting both reactive and planned work, although there is more reactive than proactive expected to be delivered within the base cost allowance.

To mitigate the risk of contractor capacity, and in anticipation of our proposed cost change proposal being accepted, we have already scaled up and are working closely with our Tier 2 and Tier 3 supply chain. We have provided early visibility of the additional programme to suppliers to enable them to align their capabilities, resources, and plans with the new profile of work. We are onboarding additional Tier 2 and Tier 3 providers and splitting teams between proactive and reactive work which will ensure we can maintain the appropriate focus on both workstreams, although we recognise we may need to respond flexibly. We are building in the ability for new Tier 2 and Tier 3 resources to join and leave the programme without impacting on overall continuity and to support a flexible approach. We are also adjusting responsibilities of our internal jetting teams who are currently responsible for the proactive maintenance programmes to create additional capacity.

To mitigate the risk of network access constraints we are exploring opportunities for coordinating our activities across our water and wastewater programmes. Where possible, we aim to minimise inconvenience to customers and use one set of road closures to achieve both water main and gravity sewer renewals work where they coincide.

For the proposed cost change programme we will continue to monitor vulnerabilities in the supply chain, develop specific contingency plans if the need arises and address potential disruptions or delays in the supply chain. We will track supply-chain performance against PCD linked milestones.

6 Assurance

The proposed investment in gravity sewers has been subject to independent technical assurance by Jacobs in accordance with ISAE (UK) 3000 standards. Jacobs concluded that the approach to identifying and prioritising interventions is structured and methodical, with a clear and transparent basis for investment planning. In particular, the move towards a catchment risk modelling approach was recognised as a strength, enabling more strategic targeting of interventions to deliver the greatest benefit and best value for customers. The use of Copperleaf investment system, supported by PR24-aligned unit rates and whole-life costing, alongside Risk, Opportunity and Value (ROV) assessments, provides a robust framework for option development and appraisal.

Jacobs found that data governance was reliable and consistent, with cost data aligned across internal systems and Ofwat reporting tables, and no material issues identified through sample testing. While the scope of assurance was focused on high-risk catchments and some recommendations were made to further strengthen the long-term asset strategy, these were non-material and do not affect the overall conclusion.

Overall, this independent assurance provides confidence that the gravity sewer investment proposals are technically robust, evidence-based, and aligned with regulatory expectations, supporting effective risk reduction and long-term resilience.

Jacobs reports can be found at ANH-CC26-10 Commercial Report and ANH-CC26-11 Technical report.

Part B:
Gravity sewers – survey

1 Need for additional investment

1.1 Introduction to need for CCTV Survey

Ofwat has indicated that in 2026 it will issue a data request to all wastewater companies to provide visual inspection data on a random, representative sample of gravity sewers. The proposed level of investment for CCTV survey will deliver the 0.5% of gravity sewer network survey requirement as specified in Ofwat Guidance.

We welcome Ofwat's recognition that additional funding is required to complete the condition grading exercise for sewers, over and above our current inspection programme which is focused on inspecting lengths suspected of being in poor condition. Our estimate for what base buys covers rehabilitation and inspection, and therefore we can be confident that the new requirement to inspect a representative sample of 0.5% is additional to that.

Our final selection of sewers will be consistent with the principles set out by Ofwat it's guidance and any further guidance issued in due course. This will ensure a random representative survey is undertaken.

1.2 CCTV Survey Selection Methodology

In line with Ofwat's guidance which requires companies to explain how sewer lengths are chosen for asset health assessment, we wet out the methodology below:

To define the group of sewers that would be considered for sampling, the following exclusions were applied:

- Very large "tunnel sewers" (pipes with a diameter greater than 1500mm) as these are operationally different to standard sewers
- Recently constructed sewers (for example, those made from modern plastic materials)
- Sewers that had been inspected recently using CCTV, as up-to-date condition information already exists.

The remaining network was then divided by the type of water it carries:

- Foul
- Combined
- Surface water

A model of the remaining sewer network was created to reflect how the network is connected and how flows move through it. A Python-based algorithm was used to trace each sewer route upstream, starting from its endpoint (such as on outfall or water recycling centre), until key breakpoints on the network were reached.

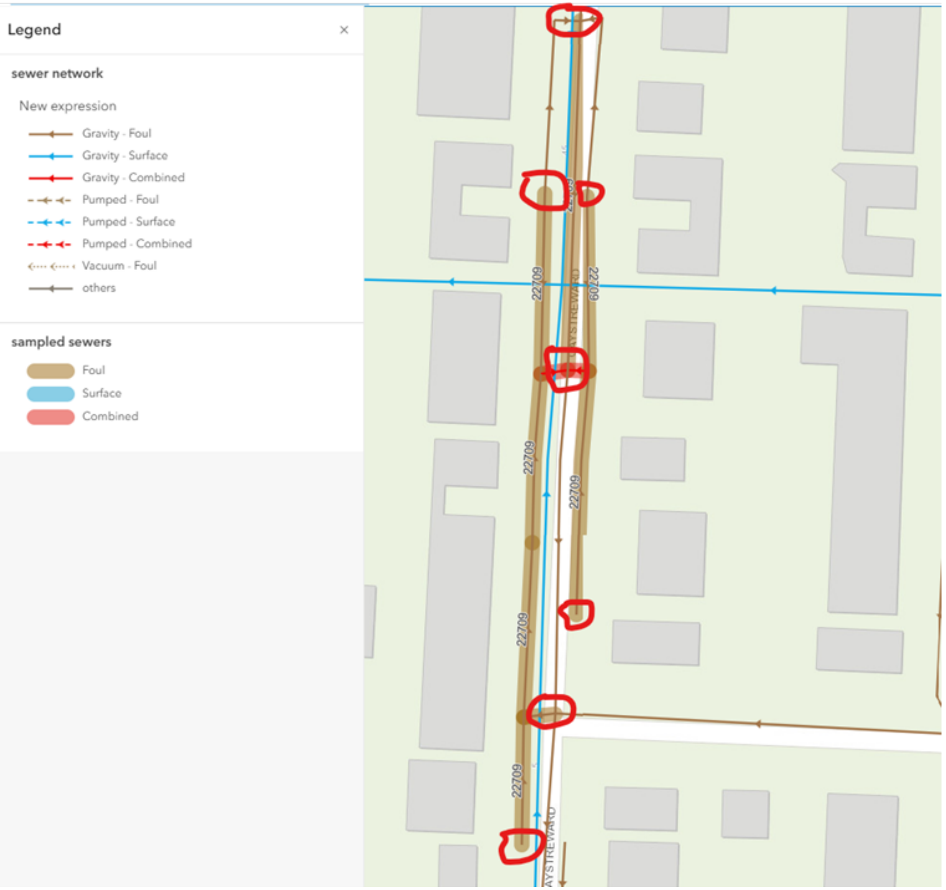
Breakpoints were identified where:

- A manhole connected four or more pipes (multiple pipes flowing in and one flowing out), or;
- The upstream end of the network was reached

This process divided the sewer network into separate sections that function together hydraulically and can be treated as coherent sub-systems.

The figure below illustrates an example of one of these sewer groups, highlighted in brown. Red circles show where the algorithm stopped, either at a breakpoint or at the upstream end of a network.

Figure 4 Example of a sewer group



Once the network had been divided into groups in this way, the groups were randomly ordered and individual sewers were selected in line with Ofwat's gravity sewer assessment guidance.

Following this partitioning, sub-systems were randomly selected until the required sample length was met in accordance with Ofwat's gravity sewers assessment guidance.

For Anglian, the required sample size is 367 km.

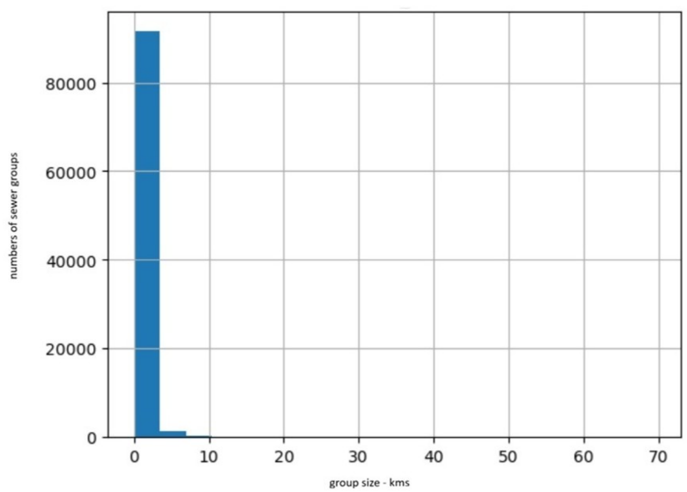
Of this:

- 244 km (two-thirds) was allocated to sewers where physical inspection data could be collected
- This was further split based on historic evidence of sewer collapses:
  - Surface water sewers: 10% (24 km)
  - Foul and combined: 90% (220 km)

The remaining sample length was taken from modelled transferred sewer paths, as physically captured data for transferred sewers was not available.

Because of the way the sewer network was divided into hydraulically coherent sub-systems, the size of these groups varies significantly for physically captured sewers. As shown in the chart below, most groups are fairly small and similar in size, but the largest group is 67 km length.

Figure 5 Distribution of grouped sewers sizes in KM



This means that when randomly selecting groups to reach a target length, the final selected group can push the total over the intended upper limit. This has resulted in small over-selection for physically captured sewers, as shown in the table below.

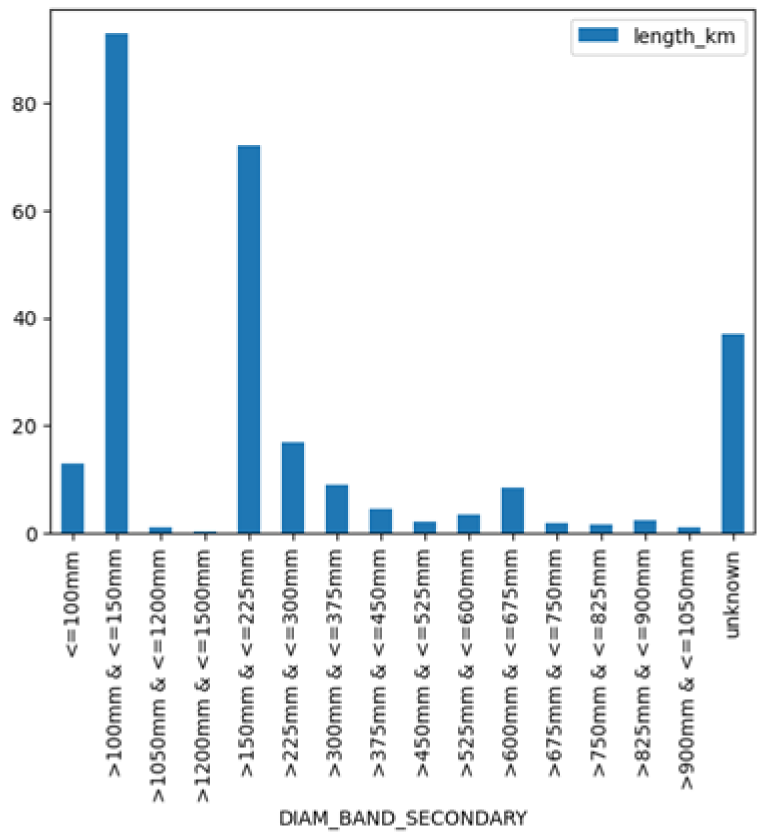
Table 7 Sewer lengths selected by liquid type

Liquid type	Length	%
Combined	25.87	9.65
Foul	216.65	80.81
Surface	25.57	9.54

The target limit for surface water sewers was 24 km, but 26 km were selected. For foul and combined sewers, the target was 220 km, but 243 km were selected. In total this results in 268km of physically captured sewers being included in the sample.

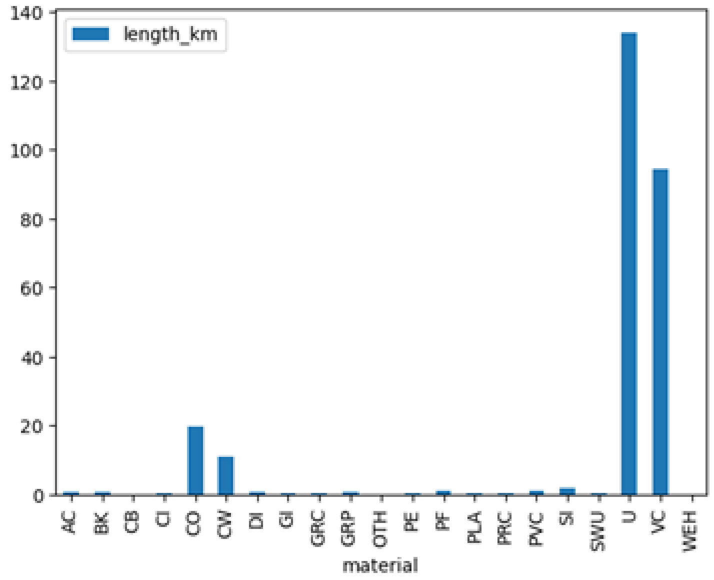
The below graph shows the selected sewers cover a good range of pipe diameters.

Figure 6 Length of sewers by diameter bands for sampled groups



There is also a good spread of material types selected for sampling:

Figure 7 Length of sewers by material for sampled groups



The selected sample provides:

- A wide range of pipe diameters
- A representative mix of material types

The sample is balanced and representative of the network.

The remaining sample requirement (~98 km of the 367 km requirement) was taken from modelled transferred sewer paths, developed in line with Ofwat guidance.

To build the transferred sewer modelled paths we followed industry guidance as set out in the Water UK guidance document[15].

The below shows an example of these transferred sewer paths, highlighted with thick green lines.

15 https://www.water.org.uk/sites/default/files/wp/2019/03/Private-Sewer-Transfer-Water-UK-Template.pdf

Figure 8 Example of transferred sewer path

Transferred sewer paths were:

- Modelled based on assumed connectivity and transfer rules
- Grouped geographically into sewer sub-catchments
  - These are defined as areas draining into a pumping station or water recycling centre

This grouping was necessary to:

- Avoid selecting isolated or unrepresentative short pipe sections
- Maintain operational and hydraulic coherence

The same random selection process was applied to these grouped transferred sewer sections until the remaining target length was reached. As with the physically captured sewers, this resulted in the target being exceeded. Instead of 98 km, a total of 182 km was selected. The sampling returned 20 sub-catchment groups, with the largest sampled group being 158 km in total length.

This resulted in a total randomly sampled sewer length of 450 km (83 km over the proscribed sample size).

This level of variation is a direct result of the methodology adopted, in particular:

- Sampling is carried out using complete, hydraulically meaningful sections, rather than individual pipes
- The size of these sections vary considerably, making exact lengths difficult to meet
- Random selection was maintained throughout to avoid bias

Importantly:

- The approach prioritises representativeness and network integrity over strict compliance with length limits
- The final sample provides strong coverage across sewer types, materials and geographic areas
- No systematic bias has been introduced through the selection process

2 Best option for customers

A range of technologies are available in the market to assess the condition of sewer assets. These methods differ in terms of capability, applicability, cost, and the level of condition information they provide.

The table below summarises the principal sewer condition assessment technologies, highlighting where each method is most effective and the key limitations to be considered when selecting an appropriate approach.

Table 8 Summary of the principal sewer condition assessment technologies,

Alternative and complementary technologies in the market	What is it	What it can grade	Where it works best	Limitations
CCTV + Condition Assessment Survey	Combines traditional CCTV inspection with a formal, standardised condition assessment Manual of Sewer Condition Classification (MSCC), published by the Water Research Centre (WRc). In addition to capturing video footage, observed defects are coded, classified, and graded in line with recognised standards, producing auditable condition scores.	Structural condition (e.g. cracks, fractures, deformation, collapse risk) Service condition (e.g. roots, debris, silt, infiltration) Overall condition grades to support prioritisation and intervention planning	Gravity sewers across a wide range of diameters Network wide programmes requiring consistent, repeatable data Investment planning and options appraisal, where auditable evidence of need is required Regulatory submissions where standardised condition grading is expected	Requires cleaning and access, which can add cost and time Less effective in fully surcharged or inaccessible pipes Requires manual grading for pipes attacked by hydrogen sulphide Visual method only - cannot detect external defects or material loss beyond the pipe wall More detailed (and higher cost) than simple inspection where grading is not required
Multi Sensor Inspection (MSI)	A combined inspection using: CCTV (visual defects above waterline) Laser profiling (LiDAR) to measure pipe deformation and ovality Sonar to assess defects and sediment below the waterline	Structural condition (geometry, deformation) Service condition (sediment depth, blockages)	Large diameter gravity sewers Pipes running partially full Strategic trunk mains	Significantly higher cost Less suitable for small diameter networks Still relies on CCTV for visual defect interpretation Not proportionate for network wide programmes
Laser / LiDAR Profiling (Stand alone)	High precision laser scanning to measure pipe geometry and deformation.	Ovality Loss of cross section Structural deformation	Concrete or brick sewers Large diameter assets Structural deformation studies	Does not identify cracks, fractures, roots Cannot fully replace visual condition grading Requires interpretation alongside CCTV Insufficient on its own for full condition grading
Acoustic Inspection (Sonar / Hydrophone based)	Sound based inspection used to identify anomalies below the waterline.	Sediment levels Voids Blockages Gross defects	Live flow conditions Pipes that cannot be fully dewatered	Limited defect classification capability Requires correlation with CCTV for grading More common for force mains than gravity sewers Valid as supplementary tool

Alternative and complementary technologies in the market	What is it	What it can grade	Where it works best	Limitations
Zoom Camera (Pole Camera) Surveys	High zoom cameras deployed from manholes without crawler entry.	Presence/absence of visible defects Gross structural condition	Screening large networks Early stage prioritisation Pipes that do not justify full CCTV	Limited coverage length Cannot deliver full defect coding Not compliant with MSCC grading standards Not acceptable as sole grading evidence
Indirect Methods (Smoke Testing, Dye Testing, GPR)	Identify infiltration, misconnections, voids, or external issues			Do not provide internal pipe condition grading Cannot support structural condition scoring Supplementary diagnostics only
AI Assisted Defect Detection (from CCTV footage)	Machine learning tools that automate defect identification and grading using CCTV footage.		Improves consistency Reduces subjectivity Supports QA and assurance	Still dependent on CCTV data capture Requires governance and validation

We have selected to CCTV and Condition Assessment Survey (CAS) due to the requirement to be able to condition grade the assets from the imagery.

3 Robust and efficiency costs

3.1 Sewer survey

CCTV surveys + CAS has been our primary method for grading the condition of gravity sewers for over 15 years. This consistent use of a standardised and auditable methodology has established CCTV + CAS as a proven and reliable basis for asset condition assessment and investment decision-making. These surveys will usually provide:

- Structural condition grades (e.g. cracks, fractures, deformation, collapse risk)
- Service condition grades (e.g. roots, debris, silt, infiltration)
- Overall condition scores for each pipe length
- Identification of critical defects requiring intervention

As a result, our historic cost data is predominantly derived from programmes delivered using this technology, providing a robust and comparable evidence base for forecasting and benchmarking. Delivery through established framework agreements, who were appointed through a competitive procurement process, within the supply chain further ensures that surveys are procured at competitive, market-tested rates, securing value for money while maintaining data quality and consistency across programmes.

We have included these costs as opex since the intent of the work is not to identify lengths of poor condition sewer to feed capital schemes but to gain a representative sample. Therefore the work cannot be capitalised according to accounting standards.

3.1.1 CCTV + CAS survey

Analysis of historic CCTV +CAS survey delivery data has been undertaken to understand the relationship between surveyed length, mobilisation effort, and unit cost. This analysis identified a consistent average length surveyed per catchment, providing an empirical basis for setting efficient unit rates rather than relying on point estimates or isolated schemes.

This ensures that costs are grounded in actual delivery experience and reflect realistic, repeatable performance.

The unit rate has been developed on a programme of inspection lengths that are on average 300m per survey rather than lots of short lengths which are fragmented or ad hoc surveys. This enables:

- Reduction in repeated preliminaries and mobilisation costs;
- More efficient utilisation of survey crews and equipment; and
- Avoidance of sporadic traffic management, which can introduce inefficiency when surveys are undertaken in isolated locations.

This approach demonstrates that efficiency has been actively designed into the programme, rather than assumed.

Historic delivery data has been analysed to inform the development of an optimised and efficient unit rate of £30 per metre. This assessment focused on identifying a programme structure that enables economies of scale to be realised through coordinated, sectorised delivery, rather than fragmented or ad-hoc survey activities.

This optimised approach ensures that the unit rate:

- Reflects realistic, deliverable efficiencies;
- Avoids inflation of costs driven by fragmented delivery; and
- Is representative of an efficiently planned, programme-based approach rather than isolated survey activities.

This approach demonstrates compliance with Ofwat's expectations by ensuring that survey costs are no higher than necessary to deliver the required level of asset intelligence, while maintaining a robust audit trail and value for money for customers.

Below is a summary of the cost of our proposal. A full cost breakdown can be found in ANH-CC26-17.

Table 9 Summary of costs for CCTV survey element of our proposal

Investment	Title	Construction technique	Length (m)	AMP8 opex (£m)
I048212	PR24 CC Sewer CCTV	CCTV Survey	366,600	10.993

4 Customer protection

4.1 Customer protection

For the gravity sewer CCTV survey activity we are proposing a standalone, tightly scoped, unit rate focused PCD. We will measure our delivery against the required survey length of 367km, with a non-delivery incentive that returns funding to customers (based on £/m) in the event our proactive inspection activity falls short. The detailed definition of our proposed PCD[16] includes conditions that we undertake, score and capture survey information in line with MSCC5 and that our activity aligns to the cohorts set out in your methodology (eg: for age; pipe diameter; pipe material; sewer type).

We propose an end-of-period PCD focused on the proactive activity to support our return to reflect that:

- this a specific regulatory data request;
- it has an end-of-period deadline and no interim milestones; and
- the request is likely to drive significant activity across the sector, creating supply chain pressure and meaning that the flexibility associated with an end of period milestone will be important to support delivery.

We welcome discussions on our proposed PCD design and definition as the guidance and data requests in this area develop

16 See ANH-CC26-17 PCD Technical Annex

5 Assurance

The proposed investment in gravity sewers has been subject to independent technical assurance by Jacobs in accordance with ISAE (UK) 3000 standards. Jacobs concluded that the approach to identifying and prioritising interventions is structured and methodical, with a clear and transparent basis for investment planning. In particular, the move towards a catchment risk modelling approach was recognised as a strength, enabling more strategic targeting of interventions to deliver the greatest benefit and best value for customers. The use of Copperleaf investment system, supported by PR24-aligned unit rates and whole-life costing, alongside Risk, Opportunity and Value (ROV) assessments, provides a robust framework for option development and appraisal.

Jacobs found that data governance was reliable and consistent, with cost data aligned across internal systems and Ofwat reporting tables, and no material issues identified through sample testing. While the scope of assurance was focused on high-risk catchments and some recommendations were made to further strengthen the long-term asset strategy, these were non-material and do not affect the overall conclusion.

Overall, this independent assurance provides confidence that the gravity sewer investment proposals are technically robust, evidence-based, and aligned with regulatory expectations, supporting effective risk reduction and long-term resilience.

Jacobs reports can be found at ANH-CC26-10 Commercial Report and ANH-CC26-11 Technical report.

1 Appendix 1: What base buys technical appendix

1.1 Overview of Our Approach

To meet Ofwat's expectations and ensure a robust assessment, we applied two alternative methods for calculating the IA for gravity sewer asset health:

(a) Historic Expenditure Approach (Our Preferred Method)

This method uses:

- Long run average historic spend
- Adjusted to match observed outturn
- Normalised across 10 year and 5 year periods

This approach recognises that companies have not historically treated gravity sewer maintenance costs consistently, and therefore a long run average offers the most reliable, stable comparator.

(b) Econometric Back Casting Approach (Severn Trent Method)

This method re runs the PR24 base cost models with relevant asset costs excluded to infer what the model implicitly provides for each priority asset.

We replicate this approach because Ofwat has indicated that both methods should be considered when forming a rounded view of What Base Buys.

1.2 Scope of Costs Included in the Implicit Allowance

In Ofwat's November 2025 regulatory data request, companies provided cost data under four categories for each priority asset:

- Repairs
- Refurbishment
- Replacement
- Other

Although Ofwat suggested focusing IA analysis on refurbishment and replacement, we applied a dual scope analysis:

1. Refurbishment & Replacement only
2. Total costs (all four categories)

This was necessary because:

- Historic categorisation varies materially across companies
- Some companies do not consistently distinguish between repair and refurbishment
- Total cost analysis mitigates this risk of misalignment

1.3 Triangulation Method

There is no single correct way to compute an average implicit allowance. We therefore triangulated across multiple variables:

- · Industry average vs. Anglian average
- · Mean vs. median calculations
- · 10 year (2015-25) vs. 5 year (2019-24) periods
- · Refurbishment & replacement vs. total cost basis
- · Weighted vs. unweighted averages

The only clear preference is for weighted averages, which better reflect the proportional artefacts of delivery programmes over time.

By combining these approaches, we avoid overweighting any single methodological choice and instead produce a robust central estimate.

Implicit Allowance Results

A summary of the IA results for AMP8, expressed in 2022/23 Price Base is set out below. Three broad categories of approach, an econometric and a mean and a median average approach have been summarised and an overall triangulated figure shown. We also show our per AMP spend over the last ten and the last five years.

Table 10

AMP8 IAs	Econometric	Mean	Median	Triangulated Central Estimate	Anglian total historic spend per AMP	
					Based on 10 years data	Based on most recent 5 years
Gravity sewers £m[a]	200.0	216.8	206.3	207.7	210.5	209.2

a 22/23 PB

Our internal workload and expenditure submissions show that our historic spend in the most recent five years and our AMP8 forecast spend both exceed the central IA estimate, demonstrating:

- Our reactive and limited proactive activities already consume nearly all of the IA envelope
- Our base allowance is insufficient to fund a sustainable level of proactive renewals

It is also important to note that these IA figures are derived from Final Determination base allowances, which were subsequently reduced by the CMA. Therefore, the IA figures above overestimate the true amount currently funded within base.

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THE QUEEN'S AWARDS FOR ENTERPRISE: SUSTAINABLE DEVELOPMENT 2020

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