AtkinsRéalis

Final report for issue

IPART

9 May 2025

IPART_2025 / 2 / DG / 003

IPART SYDNEY WATER EXPENDITURE REVIEW (2025)

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Client signoff

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List of acronyms

Acronym	Definition
AIR	Annual Information Return
AWRC	Advanced Water Recycling centre
BWN	Boil Water Notice
BOO	Build, Own and Operate
BTS	Base, Trend and Step
BxP	Business Experience Platform
Capex	Capital expenditure
CBA	Cost Benefit Analysis
CESSM	Civil Engineering Standard Method of Measurement
CoF	Consequence of Failure
CxP	Customer Experience Platform
DABC	Delivery Approval Business Case
DMA	District Meter Area
DOOF	Deep Ocean Outfall
EAM	Enterprise and Asset Management
EGWWS	Electricity, Gas, Water, and Waste Services
ELL	Economic Level of Leakage
ELWC	Economic Level of Water Conservation
ENZ	Environmental and Natural Zoning
EPA	Environmental Protection Authority
EPL	Environment Protection Licence
ERN	Emergency Response Notices
ERP	Enterprise Resource Planning
FTE	Full Time Equivalent
FY	Financial Year
GIS	Geographical Information System
GSWS	Greater Sydney Water Strategy
HNNMF	Hawkesbury Nepean Nutrient Management Framework
ICIO	Infrastructure Capital Investment Overview
IIP	Infrastructure Investment Program
IPART	Independent Pricing and Regulatory Tribunal
MCA	Multi-criteria analysis
NABC	Needs Approval Business Case
NPV	Net Present Value
NSOOS	Northern Suburbs Ocean Outfall Sewer
NSW	New South Wales
OABC	Options Approval Business Case
Opex	Operating expenditure
PAC	Powdered Activated Carbon
PCaR	Performance, Cost and Risk
PoF	Probability of Failure
Propex	Project opex
PRW	Purified Recycled Water
PxP	People Experience Platform
RCM	Regulatory Cost Model
RDP	Regional Delivery Partner
RPE	Real Price Effect
RRWS	Reliable and Resilient Water Supply
SDP	Sydney Desalination Plant
SHSF	Sydney Housing Supply Forecast
SIR	Special Information Return
SWAM	Sydney Water Aquatic Monitoring
SWC	Sydney Water Corporation

Acronym	Definition
SWSOOS	Southern and Western Suburbs Ocean Outfall Sewer
THM	Trihalomethane
Totex	Total expenditure
TPH	Total Petroleum Hydrocarbons
TWG	Technical Working Group
TZP	Travel Zone Projections
UGI	Urban Growth Intelligence
VOC	Volatile Organic Compounds
WFP	Water Filtration Plant
WRRF	Wastewater Resource Recovery Facility
WWTP	Wastewater Treatment Plant

Executive Summary

This report presents the findings of our review of the capital and operating expenditure for the regulated services of Sydney Water Corporation. It addresses the prudent and efficient expenditure in the future Determination period 2026 to 2030.

We have based our findings on Sydney Water's Price Proposal, the annual and special information returns (AIR and SIR) presented to IPART by Sydney Water in November 2024, five days of structured interviews, information provided by the business and responses to subsequent written questions. We are grateful to the Sydney Water team and management who have been very forthcoming in their responses to our questions.

We have applied the new 3Cs framework and recommended a range rather than a single figure for expenditure. We summarise our findings below.

Cross cutting issues

Our review of the long-term plan suggests that the options and strategies appear to have been reasonably optioneered and adaptive approaches applied. However, we do have concerns that Sydney Water has not clearly set out the service levels and risks that they need to plan for in the shorter term, which reduces the level of adaptation and cost deferral that could be reasonably planned for in their submission. We also note that Sydney Water has calibrated its growth planning against the Sydney Housing Supply Forecast (SHSF) for strategic level planning, but only at the 2035 time horizon and only at a strategic level.

We note that there are two significant sources of uncertainty in the cost estimations within the capital expenditure (capex) elements of the submission. Firstly, much of the costing relates to schemes that are at early stage with significant inherent uncertainty. Secondly, the costs in the submission are of a level and type that has not been experienced before. The nature of the schemes is different, with more advanced wastewater treatment works, large diameter mains or large scale pumping stations featuring in the planned projects. In many cases such schemes are costed by external cost estimators, rather than the Sydney Water unit cost database.

Sydney Water has made significant progress in its approach to asset management since the previous review in 2020. Its Asset Performance Tool and Health and Risk Tools have been rolled out across all asset classes. We consider that these changes are generally positive and helpful developments. However, we consider that there remains room for improvement in the identification of a robust decision criterion for how many assets should be renewed. We are concerned about the appropriateness of the scores given to assets in practice and their applicability to development of a renewals program specifically. The business did not present a systematic assessment of key enterprise level risks and how they are best managed to examine and justify the best ways to minimise these risks whether it be operational measures, renewals, response preparedness, additional redundancy, elimination of single points of failure, etc.

Operating expenditure

Sydney Water appears to have met the 0.8% p.a. efficiency target set at the 2020 Determination and opex in the current period (FY21 to FY24) was 1.4% below the IPART Determination allowance. Bulk water volumes were 7.6% lower than the IPART assumption although costs were slightly higher than the allowance because of the greater use of the Sydney Desalination Plant (SDP) due to deteriorating colour and turbidity levels in the raw water from WaterNSW.

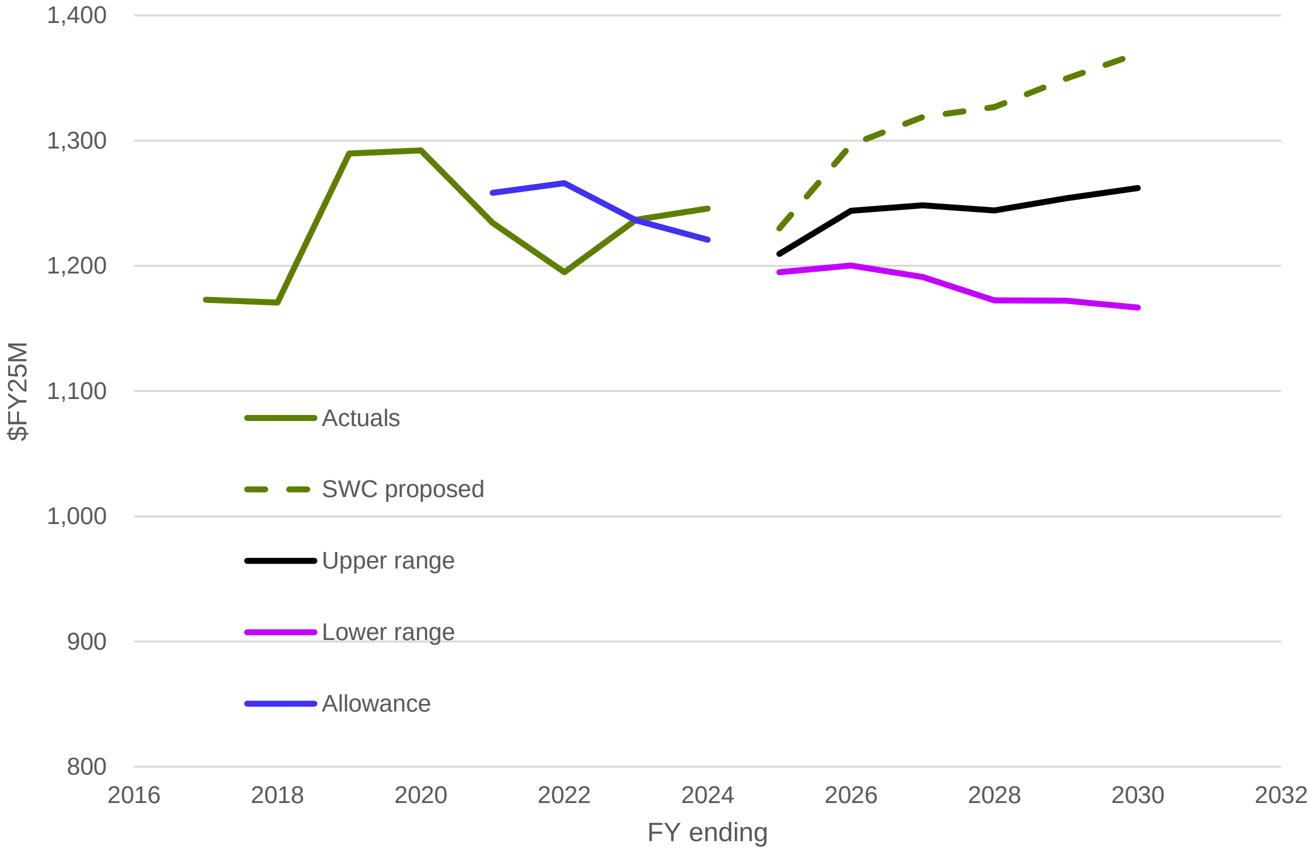
Sydney Water has proposed future expenditure using the Base, Trend and Step approach. Overall, it has proposed an 18% real terms increase from FY24 to FY30.

The three biggest differences between our view and Sydney Water's proposals relate to the following:

- The proposed trend growth rate assumed by Sydney Water is greater than our view.
- Water and wastewater maintenance: Sydney Water has included a step increase above base in maintenance expenditure where we consider asset performance is generally stable. We consider most of this step increase is not justified.
- Digitalisation: Sydney Water has proposed an increase in expenditure of $159M. We are supportive of nearly all of this step increase in expenditure adjusting it in the upper range to net off FY24 expenditure and amend cloud service costs. We have also considered a benchmarking approach for the lower range of expenditure which would reduce the proposed increase.

The recommended core opex based on the adjustments we have applied is summarised below. The upper range represents an average core opex of $1,250M p.a. (in FY26-30) or 6% below Sydney Water's proposal. The lower range makes an average core opex of $1,181M p.a. or 11% lower than the proposal.

Figure E.1 - Total core opex expenditure ranges



Source: AtkinsRéalis analysis of AIR/SIR and the 2020 AIR/SIR

Note: these costs do not include bulk supply costs as these will be determined as part of the WaterNSW Greater Sydney Determination.

Capital expenditure

Capex has been on a significant upward trajectory since FY21, with Sydney Water significantly overspending the allowance in the later years of the 2020 Determination period. The proposed capex program represents a more than doubling of the rate of expenditure in the 2020 Determination period.

Growth capex

Sydney Water has spent an average of $692M p.a. in the current Determination period (FY21 to FY24) on servicing growth and is proposing a significant increase to an average of $2,005M p.a., i.e. a near trebling of the current level of expenditure.

Overall, we confirmed that the strategy to manage growth has been adequately optioneered, with constraints on the SWSOOS and NSOOS transfers strongly influencing the wastewater management strategy, and the need for new rainfall independent supplies driving the nature of the water strategy. However, although the strategies appear to be appropriate, the timing of need is uncertain and some of the schemes may not need investment in Period 1 (FY26 to FY30).

Whilst the SDP network expansion (part of the Resilient and Reliable Water Supply - RRWS) will be required as part of the longer-term water strategy for Sydney, the case for carrying out the work within the 2025-30 period is weak and it appears that the work could be deferred without a significant increase in water supply risk to the city. For Aerotropolis Mamre Road, we have incorporated more recent, lower estimates of costs by Sydney Water for the FY26-30 period. It also appears that land prices may be lower than currently assumed for the scheme. This has been included as a lower range estimate.

For other growth capex we have identified a number of strategic schemes which are linked to constraints that arise after 2029 and we assume can therefore be removed. We have also identified that there could be a greater stretch deferral of expenditure if Sydney Housing Supply Forecast (SHSF) growth figures (rather than Sydney Water's Urban Growth Intelligence, or UGI, layer) are assumed, and that it would be prudent to consider a lower growth scenario in the evaluation of a lower range for growth costs.

Renewals capex

Sydney Water's price proposal incorporates a 55% real terms increase in renewals capex, amounting to a total renewals program of $5,508M. Wastewater renewals capex is the largest component of both historical and proposed expenditure followed by water. Stormwater renewals are projected to increase in the next period.

Whilst in its explanation for the increase Sydney Water refers to assets coming to the end of their lives, in reality the business expects the program to reduce risk and improve performance for most asset classes. This might not be an unreasonable aim if the asset risk is unacceptably high and customers support reducing it. However, Sydney Water has not set out justifications in these terms. Instead, it has defined a program by giving all assets a risk score and then using an unclear decision criterion to determine how many of them should be replaced.

In general we have found that Sydney Water has not justified that current levels of asset risk are too high and that customers should pay to increase expenditure and reduce risk. We have made adjustments to many renewals programs to better align with historical expenditure. We have also amended the critical sewer program to adjust for more achievable levels of delivery.

We found that whilst there are potential benefits for future adverse water quality events resulting from the largest of the proposed pretreatment projects (Prospect), the project does not fall into the 'very well justified, clearly has to happen now' category. The plant and business have already demonstrated that they have survived an adverse event without the need for boil water notices. This is a high capex (and opex) project and we suspect the economic case is more marginal than presented.

We consider it likely that the smart metering program will be cost-beneficial for customers over the medium term and have included it in the upper range of expenditure. Given that the smart metering element is not essential and could therefore be deferred we have identified it as a potential service level adjustment and excluded it from the lower range.

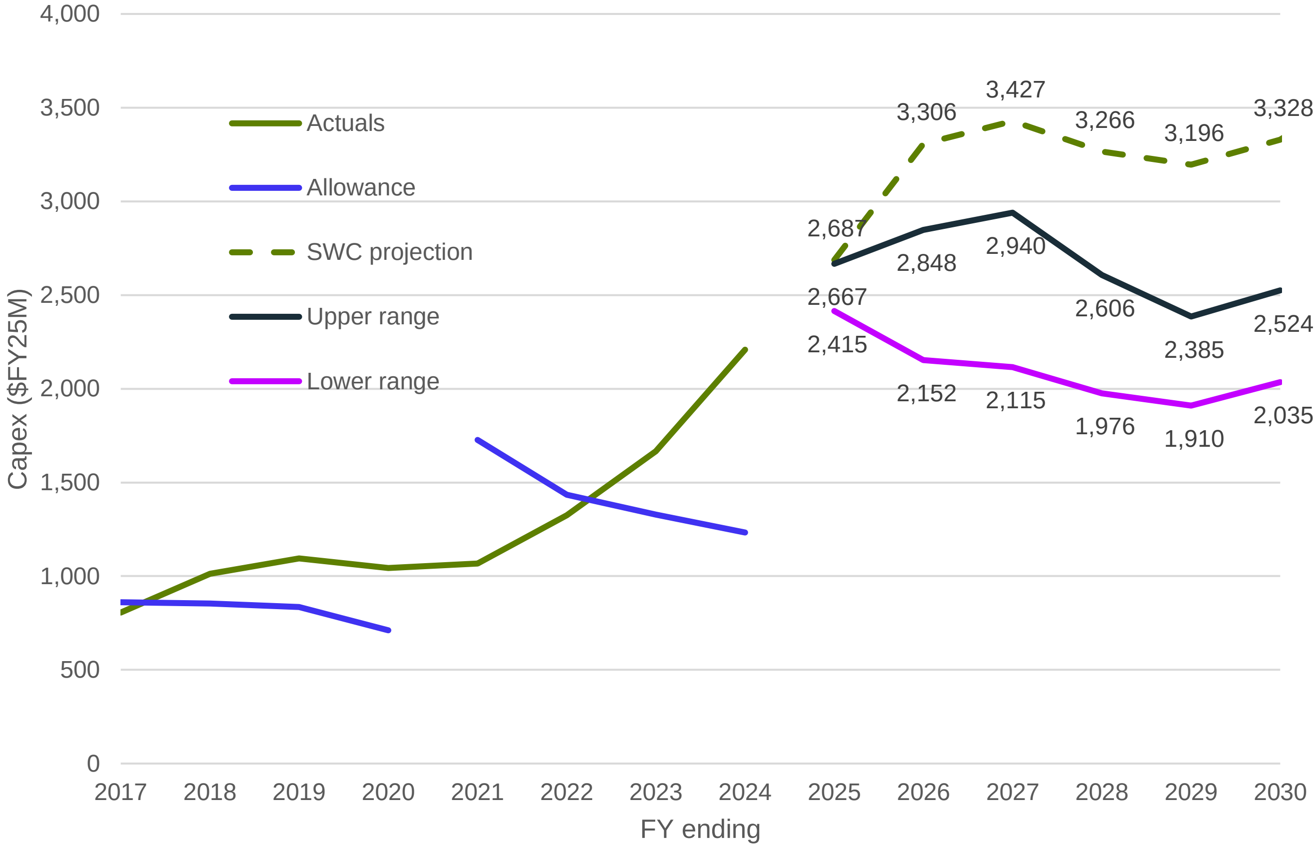
Other capex

We are largely supportive of the proposed property capex (a corporate cost) and the wet weather overflow abatement program, noting that expenditure would be lower with a change in operating environment. Some of the property capex downwards adjustments are based on more accurate values from Sydney Water.

Recommended capex

The recommended expenditure is presented in graphical form below. The upper range represents a total capex of $13,303M (in FY26-30) or 19% below Sydney Water's proposal. The lower range makes a total of $10,189M or 38% lower than the proposal.

Figure E.2 - Total capex expenditure ranges



Source: AtkinsRéalis analysis of AIR/SIR and the 2020 AIR/SIR

For growth capex, we have retained Sydney Water's portfolio adjustment effect as it assumes a level of efficiency that appears to be in line with its procurement proposals. For non-growth capex our view is that efficiency has not clearly been built into the ranges we set out, especially given that many of our recommended ranges are based on historical expenditure. We have therefore applied a continuing efficiency challenge of 0.7% p.a. (cumulating) to non-growth capex.

Digital expenditure

Sydney Water has demonstrated successful delivery of key initiatives in the current price period and is now a digitally mature organisation. Expenditure appears to be generally prudent and efficient and therefore if historical performance can be used as an indicator, then this is a positive sign for its assessment of future needs. We did, however, note in terms of deliverability of the program that actual end dates slip significantly in a reasonable proportion of cases.

The key drivers of expenditure are:

- Significant increase in Cyber and Data Centre requirements - the approach to meeting these challenges appears reasonable and efficient.
- The shift from on premise capex solutions to software and platforms as a service, which results in the balance of total expenditure shifting from capex to opex.
- Enterprise Asset Management investment drives step change increase in Systems of Record expenditure in the next price path. This aligns with plans presented at the last price review as the system will be unsupported from 2028.

Sydney Water is generally able to demonstrate a clear link between performance, investment and where applicable efficiencies, both for Information Technology and also for Operational Technology investments. For the future price path, there is evidence of prioritisation and significant cuts taken to the capital program as a result of top down decisions from executive management. We are generally supportive of the proposed approach.

We have applied a top down approach to derive a lower range of expenditure using typical corporate benchmarking.

Deliverability

Sydney Water is seeking to increase the size of its capital program significantly. Even if the adjustments described within this report are applied, the level of capital delivery across the price control period will be at a higher average level than previously achieved.

Sydney Water has demonstrated increasing maturity in procurement and program delivery, particularly in relation to major projects and regional level delivery strategies. They have provided a reasonable case that their corporate capacity and supply chain will be able to deliver an increased rate of capex spend. This included evidence from recent tenders that demonstrated access to new Tier 1 and 2 suppliers.

The organisational changes that were presented (e.g. separation of asset owner versus asset delivery) are indicative of a good ability to control/reprioritise in-period.

There are a number of factors that mean program delivery delays could still occur, including the fact that:

- Currently Sydney Water does not monitor outturn-to-estimate scheduling performance, reducing our confidence in the timing of delivery and therefore spend.
- The mix of projects proposed places a greater emphasis on large strategic schemes, including development of treatment facilities that will need to achieve very tight consent standards and support future developments such as potable recycled water. These may be more prone to delay than smaller mains and sewerage infrastructure type projects.
- State-wide constraints on infrastructure contracts are likely to continue, as the pressures from the cross-sector program are due to stay high for at least the first half of Period 1.

This means that some slippage/delay is feasible or even inevitable. However, we have already incorporated extension of delivery timelines for many of the largest schemes in the expenditure ranges provided.

Whilst recognising that it is possible there will be further delays or constraints on delivery, we have not applied any further adjustments given the adjustments we have already applied and the project development and supply chain engagement activities already undertaken by Sydney Water.

1. Introduction

In October 2024, the Independent Pricing and Regulatory Tribunal of New South Wales ("IPART") appointed AtkinsRéalis to carry out a review of the expenditure proposed by Sydney Water Corporation (Sydney Water) in its pricing proposal to IPART. The purpose of this review is to inform the Tribunal's decision on prices for the new Determination period which applies from 1 July 2025 to 30 June 2030.

This Report has been prepared in accordance with the Scope of Works set out in the contract between AtkinsRéalis and IPART dated 4 November 2024. A summary of the Scope of Works is reproduced in Appendix A for information purposes.

1.1 Scope of this report

This report presents the findings of AtkinsRéalis' review of capital and operating expenditure proposed by Sydney Water for the next Determination period. As set out in the Scope of Works, this includes:

- An assessment of the adequacy, appropriateness and efficiency of the business's levels of operating expenditure, including both historical operating expenditure for the current Determination period (1 July 2020 to 30 June 2025) and proposed operating expenditure for the next Determination period (1 July 2025 to 30 June 2030).
- Recommendations on the efficient level of proposed operating expenditure for the period 1 July 2025 to 30 June 2030.
- A detailed review of the business's planned capital expenditure from 2024-25 to 2029-30.
- Recommendations on the efficient level of capital expenditure in each service (water, wastewater and stormwater) for each year from 2024-25 to 2029-30.
- Provision of a range of efficient expenditure covering two scenarios:
  - Low case: the minimum expenditure that the business needs to conduct its essential operations (i.e. any projects that could be deferred, are deferred)
  - High case: the efficient expenditure that the business needs in order to continue to grow and set up for success into the future.

1.2 Review process

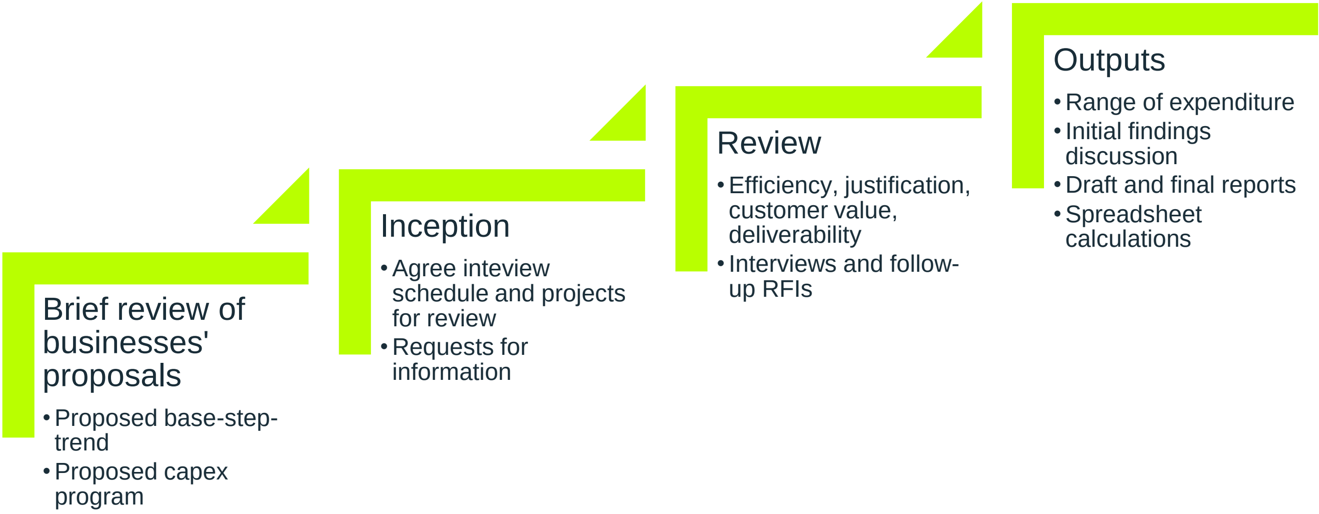
Our approach for undertaking this review is based on our experience in undertaking similar expenditure reviews across Australia and internationally over the past 15 years.

Sydney Water provided its submission to IPART on 30 September 2024 including the Price Proposal and Reading Room documents. We commenced our review on 31 October 2024. Following identification of the proposed areas of review and sample capex programs, we submitted a Request for Information (RFI) to Sydney Water on 4 November 2024. In response to this, documents were provided by Sydney Water from 8 November 2024. Our review team commenced the face-to-face interviews in Sydney Water's offices in Parramatta from 18 to 22 November 2024. Following this, we submitted an Inception Report to IPART on 3 December 2024. During and after the interview period we requested additional supporting documentation relating to a range of issues.

We believe that Sydney Water provided us with this information in a timely manner and to the best of its ability. AtkinsRéalis would like to take the opportunity to thank Sydney Water for making its staff available for the interview days and for the professional manner in which the organisation responded to our challenges and requests for further detail.

Our approach for undertaking the review is summarised graphically below.

Figure 1-1 - Stages of delivery



This report sets out the findings of our review in line with the scope above. Further detail on the methodologies used to undertake specific elements of the review are described in the relevant sections below.

1.2.1 Objectives, purpose and scope

The objectives of this review encompass expenditure (both capital and operational) and the level of risk being taken by the business. These objectives are summarised below:

- A high-level review of the business's proposal in terms of the expenditure it is planning, and how that expenditure is justified.
- A more detailed review of key elements of the business's proposed operating expenditures and capital expenditures for efficiency and deliverability.
- An overall assessment of whether the level of risk the business is taking (both financially and operationally) is appropriate.

1.2.2 Information sources

The key documents relied upon for the review include:

- Sydney Water's Pricing Submission, Appendices and Supporting Documents;
- Sydney Water's pricing model;
- Annual Information Return ("AIR") and Special Information Return ("SIR");
- Responses to RFIs provided by Sydney Water;

While some of these documents are publicly available online, the majority were directly issued by Sydney Water.

1.2.3 Report structure

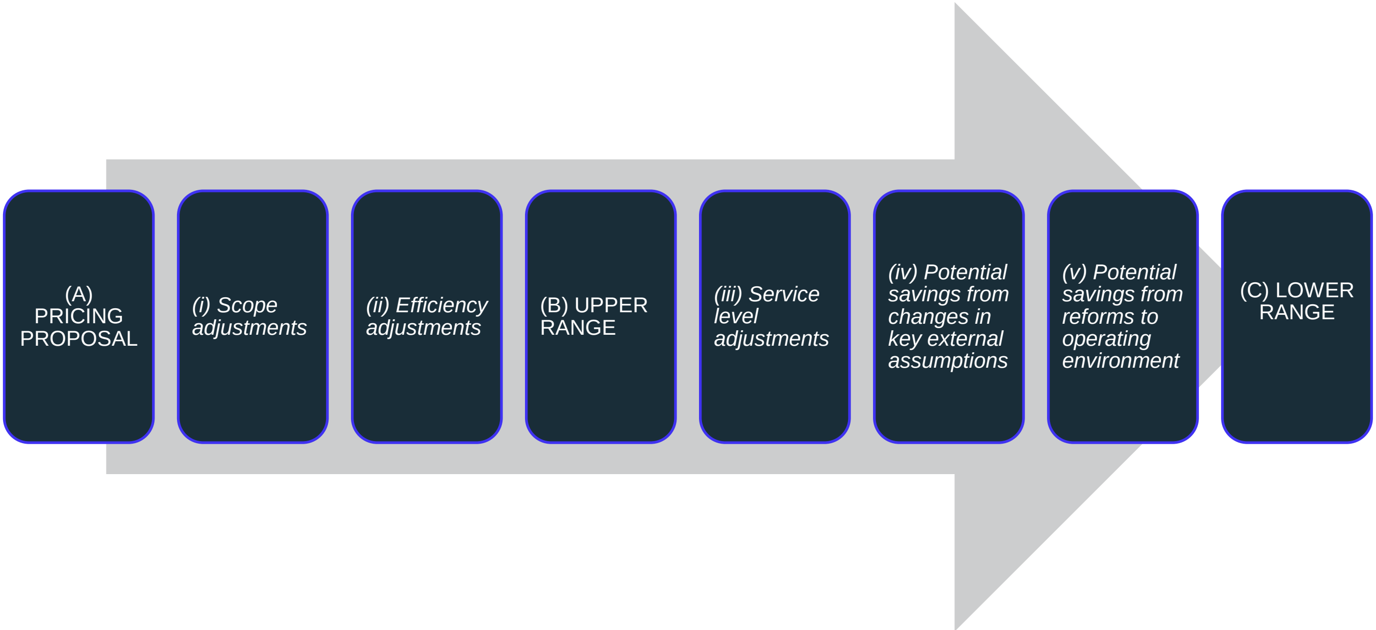
- Section 2 below sets out our view of the business's long-term investment strategy, asset management practice and processes, attitude to risk and cost-efficiency.

- Sections 3 and 4 provide detail on the approach undertaken for the operating and capital expenditure review respectively and set out our findings in line with the scope of works. These sections also set out our overall recommendations on the efficient level of operational and capital expenditure respectively in each service (water, wastewater, stormwater and corporate) for each year from 2024-25 to 2029-30.
- Section 5 provides an overview of digital total expenditure, including providing more detail behind the efficient level of expenditure covered in the previous sections.

1.2.4 Approach to developing a range of expenditure

IPART's water regulatory framework[1] requires expenditure review consultants to recommend a **range** of efficient expenditure rather than a single recommended figure. In discussion with IPART, the general approach taken to defining the range of expenditure is summarised as follows.

Figure 1-2 - General approach to defining the range of expenditure



Under this framework the upper range bound of expenditure is understood to be the efficient cost of in-scope activities/projects consistent with the proposed service levels and current operating (policy, legislative, regulatory) environment. The lower range bound is understood to be the efficient cost of scaled-back basic service levels and reformed operating environment (e.g. policy, legislative or regulatory changes).

Further description of the adjustments is provided below.

Table 1-1 - Adjustments applied in defining the range of expenditure

Element	Description
(i) Scope adjustments	Adjustments for ▪ Activities / projects that could be considered outside the scope of the regulated service including costs driven by any unregulated activities and/or activities that do not directly relate to the regulated service. ▪ Activities/projects not sufficiently certain to go ahead or lacking strong justification in period

[1] Our water regulatory framework, IPART, November 2022.

Element	Description
	▪ Errors or omissions ▪ Reflect more realistic external driver assumptions
(ii) Efficiency adjustments	▪ Removal of inefficiencies: removal of duplication, removal of operational inefficiencies, savings from bundling of activities, more realistic costing assumptions/removal of gold-plating ▪ More realistic expenditure profiling ▪ Application of efficiency challenge
(iii) Service level adjustments:	▪ Remove all remaining deferrable and non-essential activities/projects to provide the Tribunal flexibility to balance service level and affordability considerations.
(iv) Potential savings from changes in key external assumptions	▪ Amend key assumptions driving expenditure such as levels of growth, asset risk or constrained markets
(v) Potential savings opportunities from reforms to operating environment (policy, legislative, regulatory)	▪ To allow IPART to advise on potential savings from reforming existing policy, legislative and regulatory requirements.

Source AtkinsRéalis and discussions with IPART staff

1.2.5 Price base

Unless otherwise stated all expenditure amounts in this document are in financial year 2024-25 prices ($FY25). Where not already provided to us in $FY25, costs have been converted using the following index.

Table 1-2 – Index used to convert to $FY25 prices

FY:	2019	2020	2021	2022	2023	2024	2025 forecast
CPI	1.6%	(0.3%)	3.8%	6.1%	6.0%	3.8%	3.0%
Conversion factor to $FY25	1.24	1.25	1.20	1.13	1.07	1.03	1.00

Source: Analysis of Sydney Water AIR/SIR

2. Cross-cutting issues

2.1 Summary of findings

This chapter presents a review of the long-term plan and Sydney Water's asset management practice and processes.

Long-term plan

Our review of the long-term plan suggests that the options and strategies appear to have been reasonably optioneered and adaptive approaches applied. There is good evidence of options appraisal for water resource schemes, although we note that a number of conventional options (e.g. groundwater abstraction) have been discounted by policy constraints decided through the Greater Sydney Water Strategy (GSWS).

Overall, this means that the short to medium term strategies contained in the IPART submission are reflective of longer term need, and that uncertainties tend to be confined to the timing and scale of investment, rather than the type of investment that is required.

Although information on service and risk levels has been provided, we ave concerns that Sydney Water has not clearly set out the service levels and risks that they need to plan for in the shorter term. We consider that additional reductions may be possible beyond the level of adaptation and cost deferral already included in Sydney Water's submission We also note that Sydney Water has calibrated its growth planning against the Sydney Housing Supply Forecast (SHSF) for strategic level planning, but only at the 2035 time horizon and only at a strategic level. This has implications for the risk associated with growth planning and is discussed further in Section 4.5.2.

Asset management practice and processes

Sydney Water uses a structured 'gated' approach to the development and delivery of capital projects and programs. Its cost estimation performance appears reasonable to date. However, there are two significant sources of uncertainty in the cost estimations within the IPART submission:

- Much of the costing for the 2025-30 period relates to schemes that are in the pre Delivery Approval Business Case (DABC)[2] stage, and there is much more uncertainty at the Needs Approval Business Case (NABC[3]: +/-100% cost uncertainty) and Options Approval Business Case (OABC[4]: +50%/-30% cost uncertainty) stages.
- The costs in the submission are of a level and type that has not been experienced before. Sydney Water is changing its procurement practices to allow it to deliver a much higher volume of work than it has in the past, which is introducing both new contractors and forms of contract to the delivery of schemes. The nature of the schemes is also different, with more advanced wastewater treatment works, large diameter mains or large scale pumping stations featuring in the planned projects. In many cases such schemes are costed by external cost estimators, rather than the Sydney Water unit cost database.

These factors mean that there remains significant uncertainty inherent in the capital program for the coming years.

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[2] Delivery Approval Business Case (DABC) represents the outputs of the final outline design for tender stage

[3] Needs Approval Business Case (NABC) or 'Pre Planning' Business Cases represents the outputs of the initial scoping design stage

[4] Options Approval Business Case (OABC) represents the outputs of the optioneering design stage

Sydney Water has made significant progress in its approach to asset management since the previous review in 2020. Its Asset Performance Tool has been rolled out across all asset classes and allows a rapid and richer view of a number of indicators. A Health and Risk Tool has also been developed which provides an assessment of the level of current and future risk for assets and an assessment of 'backlog' where this is understood to be the number of assets with high or very high asset risk and probability of failure level 4 or 5 ('possible' or 'likely').

We consider that these changes are generally positive and helpful developments. However, we consider that there remains room for improvement and a number of challenges particularly in using it to inform the proposed renewals program. These include the following:

- The process set out is reasonably strong for identification of asset-specific issues and prioritisation of renewals interventions. However, the decision criterion for how many assets should be renewed in the next Determination period, which should be included and which not, is not clear. The approach used (essentially choosing different levels of risk for different asset classes without a clear rationale) does not provide justification about whether the amount of renewals proposed (or the 'risk appetite') is the optimal level and why customers should pay more to improve performance and risk levels.
- We are concerned about the appropriateness of the scores given to assets in practice and their applicability to development of a renewals program specifically. Our review of the asset data underlying the proposed Bondi Wastewater Resource Recovery Facility (WRRF) renewals program found that the majority (60%) of the facility's assets have been assigned the highest possible consequence of failure[5] ('extreme') including some which seem unlikely to have such high impact. This means that even some relatively new assets could be classified as 'backlog' or in need of renewal if they have a 1 in 10 year probability of failure or higher.
- The case made to us about the consequence of failure of some of Sydney Water's key facilities or systems was reasonable. However, the business did not present a systematic assessment of key enterprise level risks (such as raw sewage discharges at Bondi) and how they are best managed to examine and justify the best ways to minimise these risks whether it be operational measures, renewals, response preparedness, additional redundancy, elimination of single points of failure, etc.

Because of the increasing levels of capex and the move towards larger growth and enhancement projects (rather than the 'infill' projects that were common in previous price controls), Sydney Water has been working on and changing its procurement practices throughout the current 2020-2025 period. Sydney Water provided us with presentations and evidence that it is starting to implement very mature procurement practices, particularly in relation to major projects and area based work programs. Sydney Water also demonstrated that it has been able to widen its supplier base (including Tier 1 and Tier 2 contractors), introducing more competition and less reliance on single suppliers for less common installations such as reverse osmosis plant.

2.2 Review of long-term plan

The Long Term Capital and Operating Plan (LTCOP) and the GSWS provide important context to Sydney Water's capital expenditure proposals, in concert with many other considerations which Sydney Water incorporates to meet its many regulatory, legislative and customer obligations. The GSWS, published in August 2022 by the Department of Planning and Environment for New South Wales (NSW), sets out key issues for the region's water and wastewater systems and a series of objectives, principles and priorities for addressing these. These priorities include:

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[5] The information provided is labelled as "process" consequence of failure which is the measure Sydney Water uses to identify and assess assets in their broader system context as stated in its document "250312 Attachment 1 - Draft Sydney Water Expenditure Review Fact and Confidentiality Check".

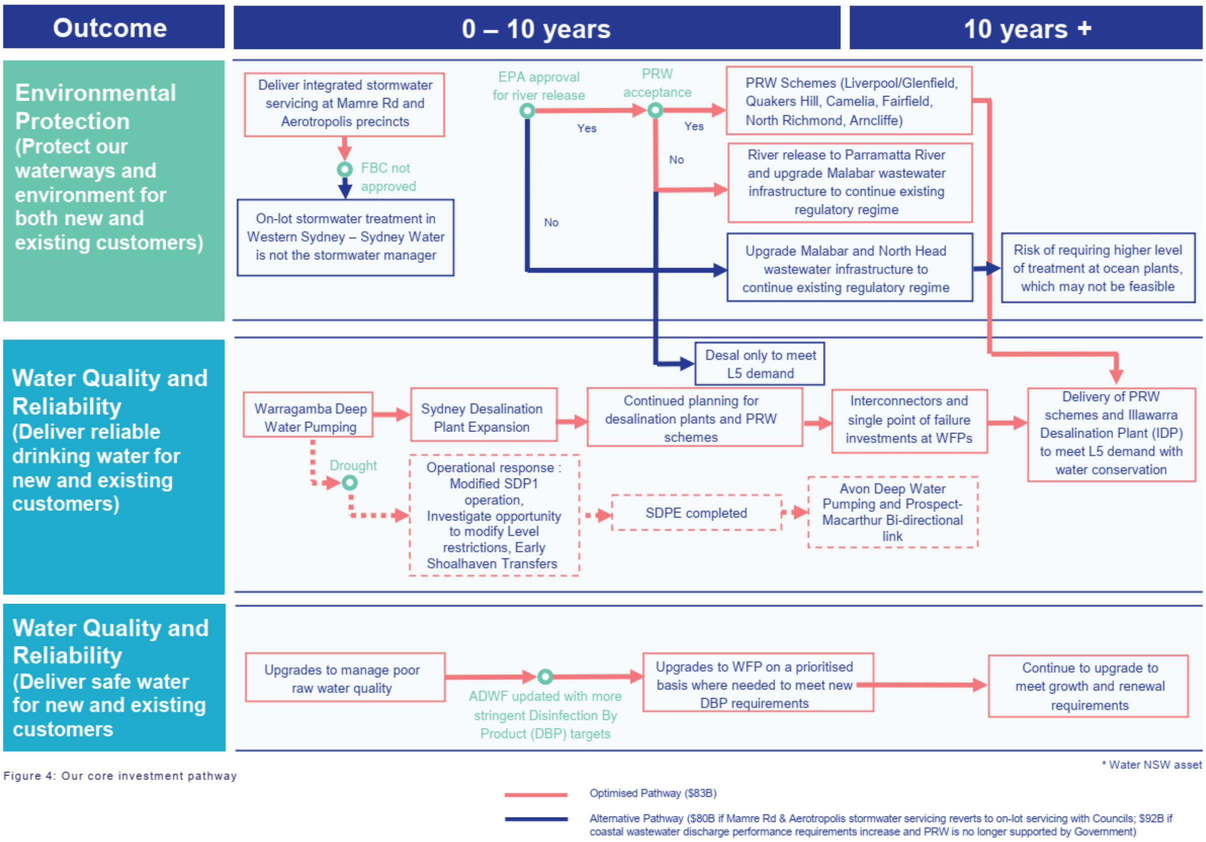
- Developing a better understanding of the ‘enduring level of supply’, community water needs and drought and climate risks;
- Developing a more resilient and adaptable water supply system;
- Using water in urban design to create a more attractive and liveable city;
- Improving waterway health; and
- Improving water management and services to meet community needs and access.

Sydney Water’s first LTCOP, first released in June 2023 and updated in September 2024, supports delivery of the GSWS and sets out the business’s long term servicing direction to 2050, identifying $32Bn of investment needed over the next 10 years and $83Bbn to 2050. Key elements of the adaptive strategy, which is summarised in Figure 2-1, include:

- Servicing the significant growth expected in Greater Sydney during this period through expanding, upgrading and developing new water and wastewater infrastructure.
- Long-term investment in Purified Recycled Water (PRW) schemes, pending regulatory and public acceptance of direct reuse or indirect augmentation (river release) to reduce flow to coastal systems and enhance water supply.
- Expansion of Sydney Desalination Plant (SDP) and development of a new desalination plant in the Illawarra region over a longer timescale as part of the move towards less reliance on rainfall.
- Development of integrated stormwater servicing at Mamre Rd and Aerotropolis precincts to reduce negative environmental impacts from stormwater overflows.
- Greater investment in asset renewals to improve asset and service performance.
- Digitalisation, including customer meter program and intelligent asset management.
- Water quality upgrades at Water Filtration Plants (WFPs).

Figure 2-1 – Investment and servicing outcomes: extract from Sydney Water's Long Term Capital and Operational Plan (LTCOP), published September 2024

Figure 2-2 – Sydney Water's core investment pathway: extract from Sydney Water's Long Term Capital and Operational Plan (LTCOP), published September 2024



The choices of options and strategies in the LTCOP have been reasonably optioneered using combined multi-criteria analysis (MCA) and net present value (NPV) analysis, so the strategies do seek to balance cost, resilience and alignment with social and environmental policies. In relation to wastewater growth there is good evidence that the localised, adaptive approach based on discharge to the Hawkesbury-Nepean with Purified Recycled Water (PRW) is more cost effective and flexible than upgrading the Northern Suburbs Ocean Outfall Sewer (NSOOS) and Southern and Western Suburbs Ocean Outfall Sewer (SWSOOS) main outfalls. Adaptive approaches are used in relation to the sizing of advanced water recycling centres (AWRCs), with modular development of the main treatment processes in response to growth.

Similarly, there is good evidence of options appraisal for water resource schemes, although we note that some options (e.g. groundwater abstraction) have been discounted by policy constraints decided through the GSWS, mainly due to a need to focus on delivering rainfall independent water supplies. The pace of development of water resources and strategic supply networks has been informed by some of the objectives of the GSWS, but it should be noted that the GSWS provides recommendations, including the need to investigate rainfall independent water supplies, rather than firm targets. We also note that the GSWS states investment strategies need to:

> *make better use of our existing assets and use our available water resources more efficiently, while establishing investment alternatives and pathways that can be followed to make the right decisions when and where they are needed. This means ensuring that all of the appropriate pre-planning has been done so that when action is needed, it can proceed without unacceptable delay and risk to water supply. These pathways should be suited to taking effective action under most future, foreseeable conditions but be flexible enough so we can change the timing, nature or location of investments as circumstances change.*

Overall this means that the short to medium term strategies contained in the IPART submission are reflective of longer term need, and that uncertainties tend to be confined to the timing and scale of investment, rather than the type of investment that is required.

The timing of actions within the current IPART submission do allow for adaptive investment in the long term, but we have concerns that Sydney Water has not clearly set out the service levels and risks that they need to plan for in the shorter term, which reduces the level of adaptation and cost deferral that could be reasonably planned for in their submission.

Growth has been calibrated by Sydney Water against the Sydney Housing Supply Forecast (SHSF) for strategic level planning, but only at the 2035 time horizon and only at a strategic level. This is because the growth forecasts used for the service plans have been taken from a mixture of developer led intelligence and default SHSF forecasts in the areas where development has not yet started. Because developers will always tend to be optimistic about the scale and pace of development, the combination of the two results in a much higher level of growth than the SHSF. Sydney Water recognises this and has developed a ‘high confidence’ growth layer in its GIS and used that as the main basis for planning in the short to medium term for the IPART submission. The strategic decisions described in the LTCOP then follow on from this, given that the UGI high confidence layer and the SHSF are effectively the same at the 2035 time horizon. A comparison of the different rates of growth forecast is provided in Section 4.5.2 below, and the implications of this have been reflected in our capex analysis for growth.

On a program level Sydney Water has recognised that large amounts of proposed infrastructure that is intended to support growth in the second five years (Period 2) of the 10 year plan can be deferred and have incorporated this into the IPART submission, as described under the Detailed Review of Capital Expenditure below (Section 4). It should be noted that in many cases this means that the scope of growth capex that has effectively been included in the two periods of the IPART submission (2026-2030 and 2031-35) is not entirely clear, but the impact of the deferral has been taken into account as far as is reasonable when carrying out our assessments of capex need.

2.3 Asset management practice and processes

We have reviewed Sydney Water’s asset management practice and processes through the building blocks of effective capital planning processes comprising:

- Project development and cost estimation;
- Asset management;
- The approach to risk management; and
- The approach to procurement.

Figure 2-3 – Building blocks of capital planning processes

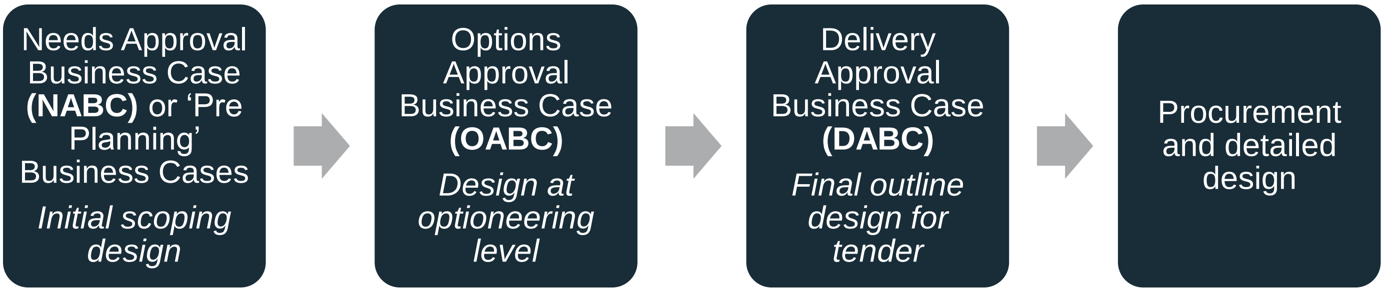
Source: AtkinsRéalis

We address these issues in the following sections. We have combined the review of asset and risk management in one section because of their interconnected nature.

2.3.1 Project development and cost estimation

Sydney Water uses a structured 'gated' approach to the development of capital projects and programs. In broad terms projects go through the following stages of development prior to final procurement.

Figure 2-4 – Sydney Water project development stages



Source: AtkinsRéalis analysis based on Sydney Water Presentations

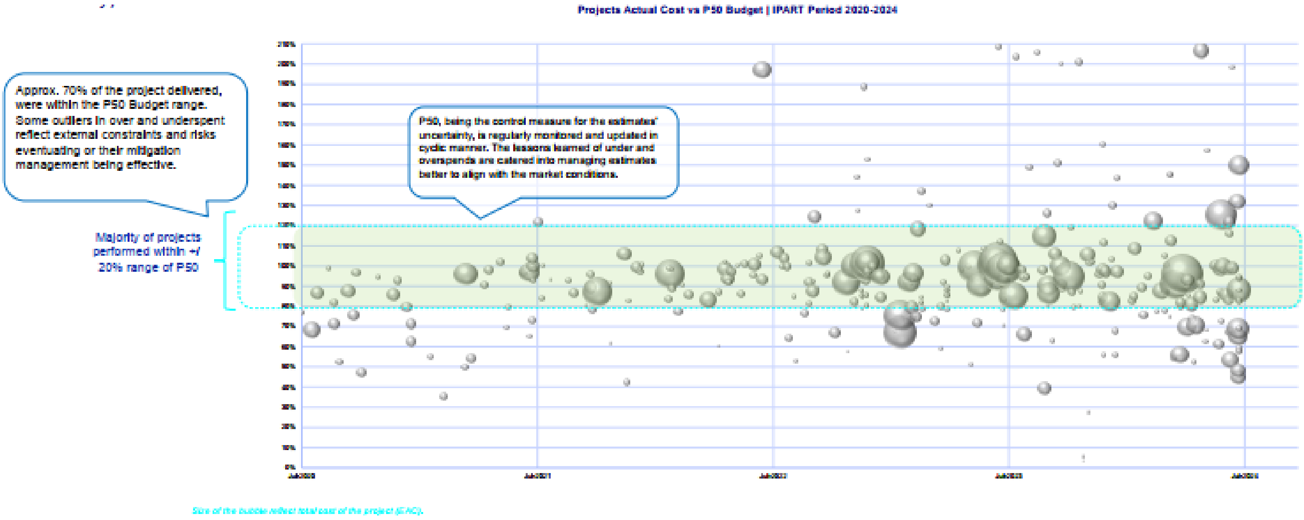
There is a formal sign off process at each stage, and projects have to demonstrate benefits against business objectives in order to attract development funding for the next stage. Both the scope and cost estimates improve during this process. Costs are derived using a unit cost database and contingency allowance approach, with Monte-Carlo analysis of cost uncertainty. Sydney Water has provided an analysis that shows that most (70%) projects are within +/- 20% of the P50 cost once they reach the DABC stage. **This demonstrates that once there is good scope certainty for projects of a type that have been delivered before, then the costing approach is reasonable for business planning purposes, provided that the schemes are of a type that has been delivered before.**

However, there are two significant sources of uncertainty in the cost estimations that we have considered when evaluating the capex contained within the IPART submission:

1) Much of the costing (around 40% for growth schemes) contained in the IPART submission for the 2025-30 period relates to schemes that are in the pre DABC stage, and there is much more uncertainty at the NABC (+/- 100% cost uncertainty) and OABC (+50%/-30% cost uncertainty) stages. A graph of DABC estimated versus actual cost is provided in Figure 2-5 below. One of the projects we reviewed (Wilton Growth Servicing – see Section 4.5.6) halved in cost during its OABC development due to a staging opportunity identified. In most cases Sydney Water reduced the cost and scope of schemes from the Business Case to the IPART submission as part of the program review in order to reflect uncertainty, efficiency and staging targets.

2) The cost analysis presented by Sydney Water for DABC schemes relates to a level and type of expenditure that has not been experienced before. Sydney Water is changing its procurement practices to allow it to deliver a much higher volume of work that it has in the past, which is introducing both new contractors and forms of contract to the delivery of schemes. The nature of the schemes is also different, with more advanced wastewater treatment works, large diameter mains or large scale pumping stations featuring in the planned projects. In many cases such schemes are costed using external cost estimators, rather than the Sydney Water unit cost database.

Figure 2-5 – Evaluation of Estimate versus Outturn Costs for Schemes at the DABC Stage



Source: Sydney Water presentation

Although Sydney Water is moving to the CESMM4[6] international standard for cost estimating at the DABC stage, currently costs are estimated using rate and quantity estimates, generated from previous contracts with associated contractor risks, overheads etc. As noted previously this has still managed to achieve a +/- 20% accuracy, which is predicted to move to +/- 10% under the new method. Costs at or later than the DABC stage therefore appear reasonably accurate without any bias.

Costs prior to the DABC stage are calculated from a combination of unit rates and interpolative (i.e. based on similar projects) assessments. This generates the larger uncertainty range referred to previously. Costs at these initial stages tend to be include relatively large uncertainties in scope. In order to manage the forecast costs from these schemes and to assist with costing processes in general, Sydney Water has set up a dedicated Infrastructure

[6] CESSM used to be an abbreviation for Civil Engineering Standard Method of Measurement. Now CESSM4 is the name of the UK Institution of Civil Engineers latest edition of the method of preparing bills of quantities for civil works.

Investment Program group (IIP). The IIP team is a dedicated unit separated from the Infrastructure Delivery Unit and reports directly to the General Manager of Water & Environmental Services (WES). The cover function of this team is to actively manage the Infrastructure investment programs and portfolio, develop the capital investment plan, and provide investment governance and assurance functions.

For the IPART submission this team has both challenged and (where appropriate) reduced scope/cost from the Business Cases before it has been entered into the IPART evaluation process, and also carried out 'top down' adjustments to the Program and resulting Portfolio of costs based on an evaluation of affordability and risk.

The rationale and impact of these 'top down' adjustments are described individually within the capex categories in Section 4, but we note that the risk assessment process presented to us did not constitute a full, detailed analysis of the implications of deferring or removing scope or individual schemes. **In other words the 'top down' adjustments were made on expenditure, but without identifying the scope or scheme level delivery costs that would be affected by these adjustments.** This is further discussed, and reflected in our approach to analysing potential capex scenarios, in Section 4.

2.3.2 Asset and risk management

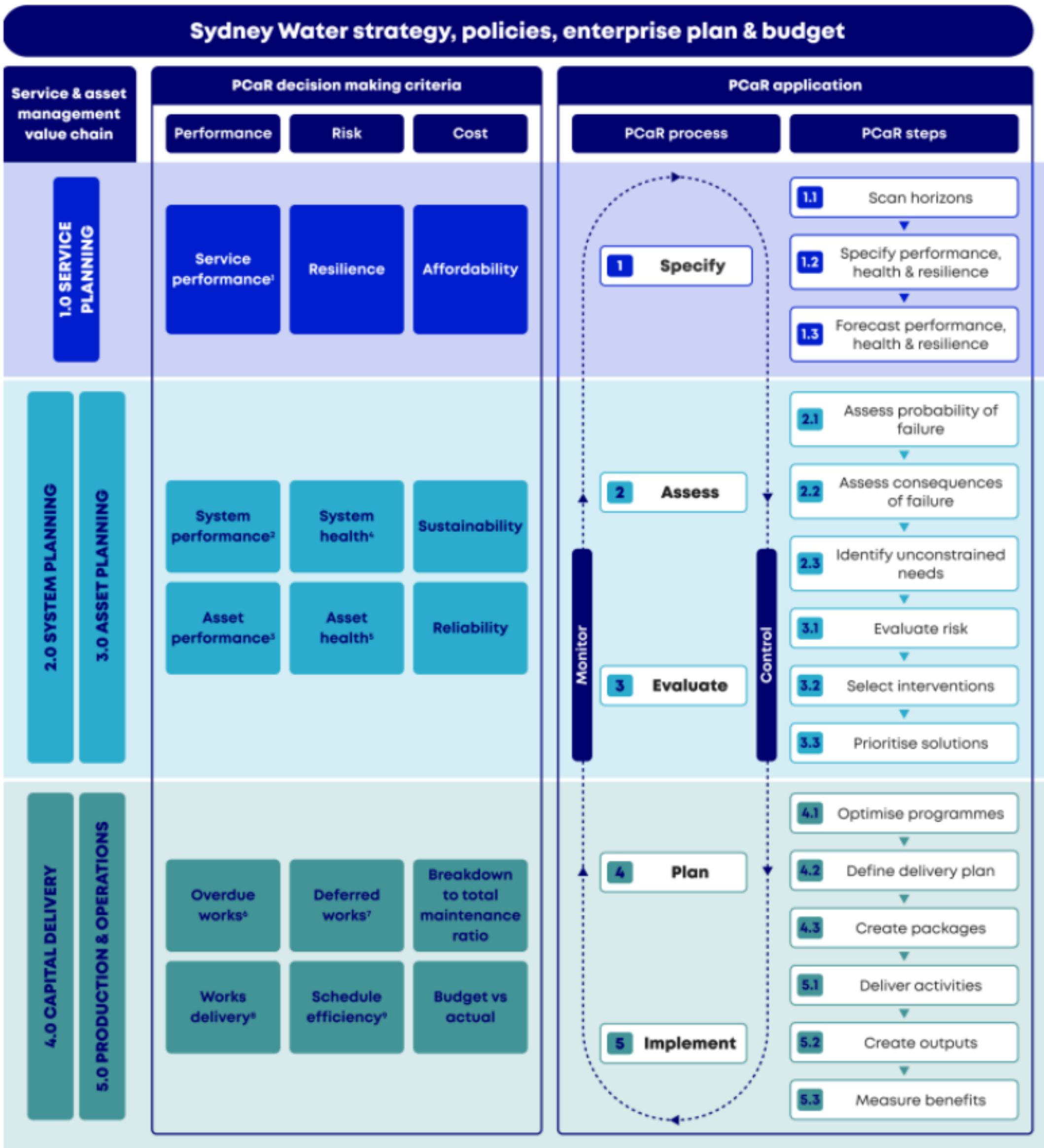
In the 2020 expenditure review we comment on Sydney Water's approach to asset management and found that there was room for further improvement in the application of risk management processes for decision making and its understanding of certain asset types, saying:

> *Sydney Water's risk processes are relatively mature; for example, it has risk appetite statements which vary based on the type of risk concerned. However, application of the risk management processes for decision making is varied and dependent on the availability of information. Sydney Water has undertaken considerable work to improve its knowledge of the condition of its assets to improve its risk-based decision making through Project See. This program will extend to water pumping stations, sewage pumping stations and reservoirs in coming years. We are concerned by the implications of the failure of the Northmead sewage pumping station with regards to Sydney Water's understanding of its asset related risks. This will require an increase in detailed condition assessments and Sydney Water to reassess its understanding of the criticality of the components of the pumping stations and pumping stations as a whole.*

Sydney Water has made significant progress in its approach to asset management since the previous review in 2020. Notable changes include:

- Development and implementation of a Performance, Cost and Risk (PCaR) approach which brings together consideration of service performance (including asset performance), risk (including asset health) and cost (affordability for example) with indicators for each.

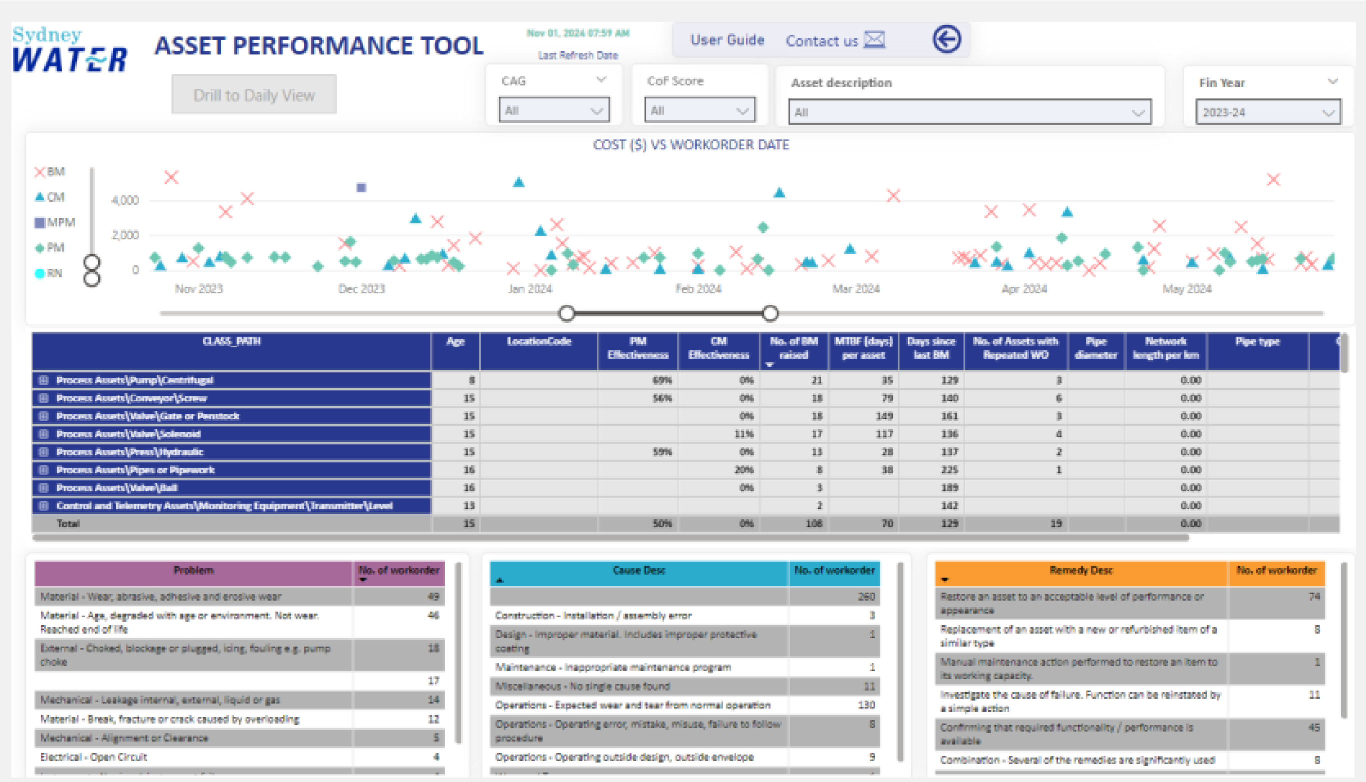
Figure 2-6 – Sydney Water Performance, Cost and Risk (PCaR) application



Source: Sydney Water presentation 2E

- Roll out of an Asset Performance Tool in PowerBI across all asset classes which allows a rapid and richer view of a number of indicators of asset performance, breakdown maintenance rates, repeat failure rates, etc. We consider that this is a powerful tool to inform asset management and decision making, especially for prioritisation of interventions.

Figure 2-7 – Excerpt of the asset performance tool

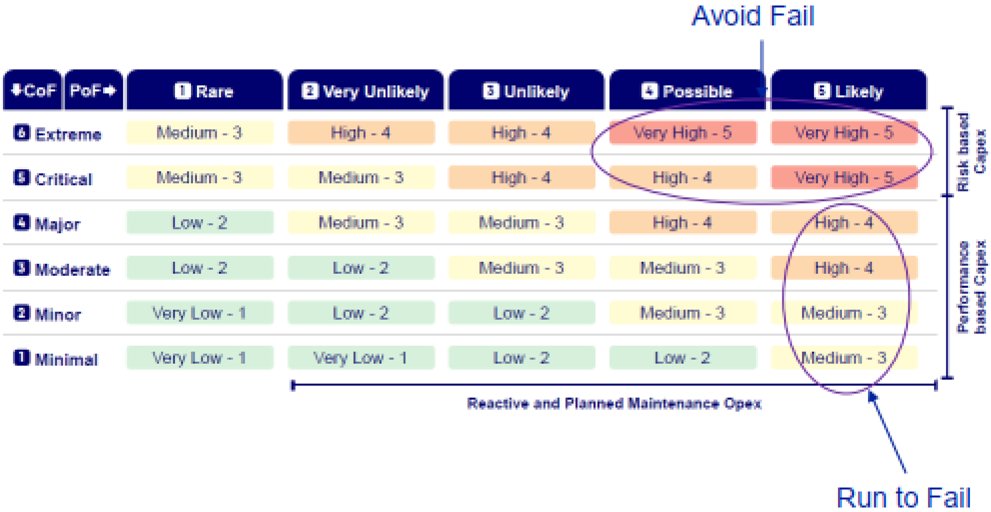


Source: Sydney Water presentation 2E

- Roll out of a Health and Risk Tool which brings together probability of failure (PoF) and consequence of failure (CoF) to derive assessments of risk at an asset level with a forward-looking view using projected asset deterioration rates. This provides an assessment of the level of current and future risk for assets and an assessment of 'backlog' .

Figure 2-8 – Sydney Water's Risk Matrix scoring[7]

	Public health	Injury/Illness	Reputation	Environment	Compliance	Financial loss	Customer & Community	Performance	Rare	Very Unlikely	Unlikely	Possible	Likely	Very Likely
	Exposure to unsafe product (acute, contaminant, chronic contaminant or hazardous material)	Harm to health and wellbeing (including psychological harm) of employees, contactors, members of public	Impact to our brand and/or reputation in terms of stakeholders, customers and trust	Adverse effect on flora, fauna, soil, waterways, resources, air quality Harm to natural and/or cultural heritage (including Aboriginal objects and Aboriginal places	Breach of legal or regulatory compliance	Financial losses or unrecoverable expenditure is incurred	Disruption to and/or cost associated with loss or damage to customer, community & developers	Impact on achieving strategic initiative Project performance impacts achieving program benefits and delivery	A very distant chance of occurring under exceptional circumstances < 0.004 < 1 in 250 < 0.4%	Not expected to occur 0.004 to 0.02 1 in (250 to 50) 0.4% to 2%	More likely to not occur, surprised if it happens 0.02 to 0.1 1 in (50 to 10) 2% to 10%	Might occur in some circumstances 0.1 to 0.5 1 in (10 to 2) 10% to 50%	Will occur in most circumstances 0.5 to 2.5 1 in (2 to 0.4) 50% to 90%	Expected to occur frequently > 2.5 > 1 in 0.4 > 90%
Extreme	• Exposure of whole drinking water supply delivery system or high exposure recycled water schemes to an Acute Hazard.	• Multiple Fatalities.	• Government enquiry or extended, negative, continuous national/international media coverage >1 week. • Loss of customer trust.	• Irreversible harm to a high value/significant or highly sensitive receiving environment. • Irreversible wilful harm to state/nationally/world listed heritage or wilful desecration to registered Aboriginal cultural heritage.	• Loss of operating licence. • High impact prosecution due to wilful act.	• >$250m	• >$125m in customer or community loss/damage • Loss of service/product reliability of >200,000 customer days	• Majority of corporate/enterprise objectives/benefits not achieved. • Majority of project objectives not achieved which are essential for program outcomes. • Level 1 & 2 Projects: $250M cost change or schedule change of >12 months. • Level 3 & 4 Projects: > $25M cost change or schedule change of >12 months.	Medium	High	High	Very High	Very High	Very High
Critical	• For a drinking water supply system or a recycled water scheme: Exposure of large numbers of people (>10,000 but not meeting Extreme criterion) to an Acute Hazard, or • For biosolids or recreational water: Exposure of >10,000 people annually to an Acute Hazard.	• Single Fatality.	• Ministerial intervention or extended, negative, continuous national/Sydney metro and social media coverage >3 days. • Decrease in customer trust.	• Long term event, requires extensive environmental remediation effort for 1 month or more. • Significant biodiversity damage (acute or long term) to a high value/significant or highly sensitive receiving environment. • Negligent harm to state/nationally/world listed heritage or desecration to registered Aboriginal cultural heritage.	• Government intervention. • High-profile prosecution due to negligence.	• $50m to $250m	• $25m to $125m in customer or community loss/damage • Loss of service/product reliability of 40,000 to 200,000 customer days	• Multiple corporate/enterprise objectives/benefits not achieved. • Multiple project objectives not achieved which are essential for program outcomes. • Level 1 & 2 Projects: $50M - $250M cost change or schedule change of 6 to 12 months. • Level 3 & 4 Projects: $5M - $25M cost change or schedule change 6 to 12 months.	Medium	Medium	High	High	Very High	Very High
Major	• For a drinking water supply system or recycled water scheme: Exposure of <10,000 people to an Acute Hazard, or • >10,000 people or whole of supply system repeatedly exposed to Chronic Hazard, or • For biosolids or recreational water: Exposure of <10,000 people annually to an Acute Hazard.	• Permanent total disability/loss of capacity.	• Ministerial interest or unbalanced, primarily Sydney metro and social media coverage >24 hours. • Widespread complaints or multiple escalated complaints to Minister or ombudsman.	• Medium term reversible pollution, requires substantial environmental remediation (multiple weeks). • Major biodiversity damage, harm to a high value/significant or sensitive receiving environment. • Major adverse impact to state and local-listed heritage or significant harm to registered Aboriginal cultural heritage.	• Regulatory sanction (Multiple statutory fines, Enforceable Undertaking). • Low level prosecution.	• $10m to $50m	• $5m to $25m in customer or community loss/damage • Loss of service/product reliability of 8,000 to 40,000 customer days	• Majority of Group objectives/benefits not achieved. • Majority of project objectives not achieved which are important for program outcomes. • Level 1 & 2 Projects: $10M - $50M cost change or schedule change of 3 to 6 months. • Level 3 & 4 Projects: $1M - $5M cost change or schedule change of 3 to 6 months.	Low	Medium	Medium	High	High	Very High
Moderate	• For a drinking water supply system, recycled water scheme, recreational water or biosolids: Repeated exposure of <10,000 people to Chronic Hazard in a year.	• Immediate admission to hospital as an inpatient and/or permanent partial disability/loss of capacity.	• Local MP interest and/or local media and social media coverage >24 hours. • Multiple and repeated customer complaints.	• Short term reversible pollution, requires some environmental remediation (1 week). • Harm to local high value/significant or sensitive environment. • Damage to locally listed heritage or partial harm to registered Aboriginal cultural heritage.	• Ministerial requirement due to Operating Licence non-compliance. • Regulatory sanction (statutory fine, Penalty Infringement Notice).	• $2m to $10m	• $1m to $5m in customer or community loss/damage • Loss of service/product reliability of 1,600 to 8,000 customer days	• Majority of business objectives/benefits not achieved. • Multiple project objectives not achieved which are important for program outcomes. • Level 1 & 2 Projects: $2M - $10M cost change or schedule change of 1 to 3 months. • Level 3 & 4 Projects: $200K - $1M cost change or schedule change of 1 to 3 months.	Low	Low	Medium	Medium	High	High
Minor	• Isolated sample(s) above Chronic Hazard guideline values. No trend.	• Treatment by a registered medical practitioner requiring ongoing treatment with no permanent disability/loss of capacity.	• Balanced coverage (i.e. includes Sydney Water's position) <24 hours. • Some customer complaints.	• Temporary pollution, requires some environmental remediation (days). • Localised harm to a natural environment, impact minimal to overall biodiversity value and plant and/or animals. • Minor adverse impact to heritage values or unregistered Aboriginal objects.	• Minor corrective action or additional business requirement imposed.	• $400,000 to $2m	• $200,000 to $1m in customer or community loss/damage • Loss of service/product reliability of 320 to 1,600 customer days	• Minority of business objectives/benefits not achieved. • Minority of project objectives not achieved which are desirable for program outcomes. • Level 1 & 2 Projects: $400k - $2M cost change or schedule change of 2 weeks to 1 month. • Level 3 & 4 Projects: $40k - $200k cost change or schedule change of 2 weeks to 1 month.	Low	Low	Low	Medium	Medium	High
Minimal	• Sample(s) above operational target(s). No trend.	• Recoverable injury or illness requiring first aid or medical treatment with no follow up required.	• One-off informative media coverage. • Some customer contacts.	• Temporary pollution contained with controls. • Insignificant, naturally reversible biodiversity damage. • Trivial/negligible impact to potential heritage value or unregistered Aboriginal objects.	• Technical compliance issue or breach with no material impact.	• <$400,000	• <$200,000 in customer or community loss/damage • Loss of service/product reliability of <320 customer days	• Very few/limited business objectives/benefits not achieved. • Very few/limited project objectives not achieved which are desirable for program outcomes. • Level 1 & 2 Projects: < $400k cost change or schedule change of < 2 weeks. • Level 3 & 4 Projects: < $40k cost change or schedule change of < 2 weeks.	Low	Low	Low	Low	Medium	Medium



⬇CoF / PoF➡	1 Rare	2 Very Unlikely	3 Unlikely	4 Possible	5 Likely
6 Extreme	Medium - 3	High - 4	High - 4	Very High - 5	Very High - 5
5 Critical	Medium - 3	Medium - 3	High - 4	High - 4	Very High - 5
4 Major	Low - 2	Medium - 3	Medium - 3	High - 4	High - 4
3 Moderate	Low - 2	Low - 2	Medium - 3	Medium - 3	High - 4
2 Minor	Very Low - 1	Low - 2	Low - 2	Medium - 3	Medium - 3
1 Minimal	Very Low - 1	Very Low - 1	Low - 2	Low - 2	Medium - 3

Source: Sydney Water presentation 2E

The Health and Risk Tool has played an important role in the development of the business's price proposal. We understand that the risk score for each asset has been used to identify 'unconstrained needs' for the renewals program (on the basis of 'high' and 'very high' risk assets).

[7] We note that there are differences between some of the risk matrices presented to us including the two shown here, with some not having the 'very likely' column on the far right. We understand that where there is no 'very likely' column these assets are falling in the 'likely' column instead.

2.3.2.1 Risk related to renewals

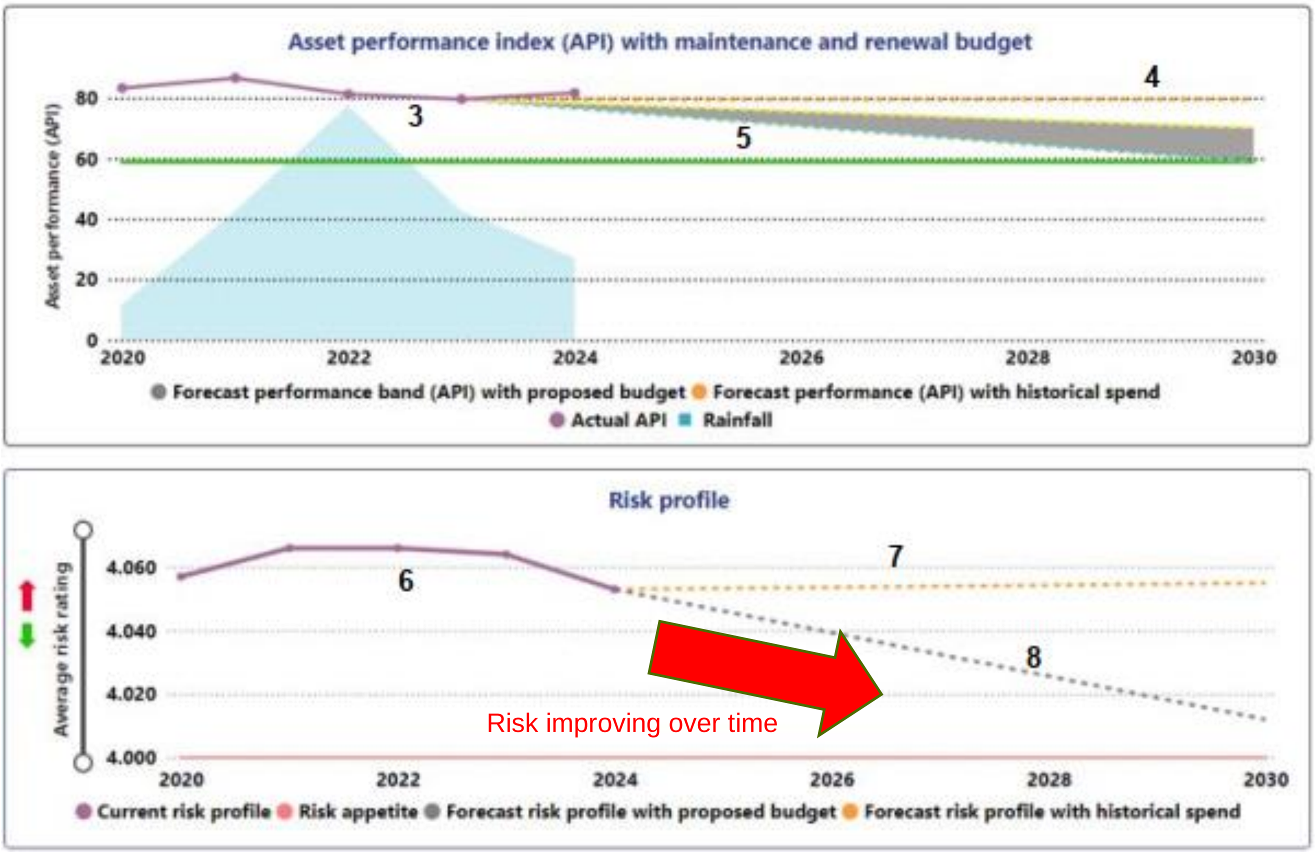
We consider that the changes set out above are generally positive and helpful developments. However, we consider that there remains room for improvement and a number of challenges particularly in using the tools developed as the basis for the proposed renewals program.

A number of these are set out below:

- The process set out is reasonably strong for **identification of asset-specific issues** and **prioritisation** of renewals interventions. However, the decision criterion for how many assets should be renewed, which should be included and which not, is not clear. The method used does not provide justification about whether the amount of renewals proposed (or the ‘risk appetite’) is the optimal level.
- The proposed risk scores of assets to be renewed varies between asset classes, with some planning to renew only a few very high risks and others very high and two lower categories of high risk[8]. The business was **not able to provide a clear analytical explanation** for how the decision had been made about which risk levels to address for each asset class. Instead the terms “reasonable size program” and “deliverability” were used to explain how the size of the program and risk levels to be addressed had been determined.
- An example of this is that with its proposed level of expenditure Sydney Water projects a significant improvement in performance and risk (lines 5 and 8 below). Generally, **if a business proposes to ask its customers to pay more to improve its asset performance/risk levels, we expect this to have strong customer support and justification in the form of a cost-benefit analysis or similar**. No such justification has been provided.

[8] For example, it is proposed to only renew some of the ‘very high’ risk non-reticulation sewers and critical water mains but to renew all of the ‘very high’, ‘high’ and many of the medium risk water reservoir assets. See Table 1 of Sydney Water document:*”79, 84, 98, 99, 100, 103, 130, 135, 141, 142, 199. - 281124 IPART Expenditure Review - Response to RFIs”*

Figure 2-9 – Sydney Water's asset performance and risk projections[9]



Source: State of the Assets Report 2024

- We are concerned about the **appropriateness of the scores given to assets in practice and their applicability to development of a renewals program specifically**. Our review of the asset risk classifications underlying the proposed Bondi WRRF renewals program as presented in Section 4.6.2.1 suggests that the CoF and PoFs (and therefore risk levels) being assigned to assets may not be an appropriate tool for renewals planning. A majority (60%) of the facility's assets are classed as having the highest possible CoF ('extreme')[10]. This means that unless an asset is classed as having less than a 1 in 10 year probability of failure (PoF) it will automatically be classified as 'backlog' and in need of renewal. This seems likely to us to capture some new or nearly new assets. **If it is correct that so many assets have an extreme CoF[11] and therefore high risk score then renewal (leaving CoF unchanged) may not be the best solution, but rather alternative actions to reduce the consequences of failure (e.g. additional redundancy, operational measures, response preparedness, elimination of single points of failure, etc).**
- The business has adopted a primarily **asset driven rather than systems driven** approach. In some cases assets were given high CoF scores because they were part of a process or system which could lead to high consequences if the system failed. However, the likelihood of their failure as an individual asset leading to these consequences was likely to be much lower than the PoF of the individual asset (because of redundancy, etc). It

[9] Note that Sydney Water refers to these graphics as a "Reference Guide" but a similar pattern is reflected for nearly all asset types in the State of the Assets report

[10] Noting that the information provided is labelled as "process" consequence of failure which Sydney Water uses to identify and assess assets in their broader system context as stated in its document "250312 Attachment 1 - Draft Sydney Water Expenditure Review Fact and Confidentiality Check".

[11] Which we are not wholly persuaded of as set out in Section 4.6.2.1

was not clear to us that system factors such as redundancy were taken into account in a consistent way across the portfolio. We examine specific examples in Section 4.

- The case made to us about the consequence of failure of some of Sydney Water's key facilities or systems was reasonable. However, the business did not present a **systematic assessment of key enterprise level risks** (such as raw sewage discharges at Bondi) **and how they are best managed** to examine and justify the best ways to minimise these risks whether it be operational measures, renewals, response preparedness, additional redundancy, elimination of single points of failure, etc.

In general, therefore, we consider that Sydney Water's understanding of asset risk has improved significantly but its assessment of and justification for the response to risk and its risk appetite (or rather the risk appetite that it asks customers to pay for) remains an area where significant improvement may be possible.

We consider that the business has not justified its choice of target risk level or the differences between proposed risk/expenditure by asset class well. It has not justified why customers should pay more for improving asset performance/risk.

2.3.2.2 Risk related to growth

We have discussed the business's attitude to risk for asset management and renewals above. In this section we examine the risks related to the growth program.

Sydney Water summarises its approach to risk management in relation to growth and compliance as follows:

- *Investment decisions are based on analysis of growth and 'on-the-ground' intelligence, including developer demand.*
- *We sensitivity and scenario test to ensure we understand how changes to growth could change the approach.*
- *We moderate investment forecast to prevent over-investment;*
- *We stage our investment to ensure we are adaptive and don't over-invest or invest too early;*
- *Certainty in servicing needs avoids inefficient bill increases for customers based on growth that may not be realised such as non-zoned areas or there is no market feasibility.*
- *We assume social and regulatory acceptance of Purified Recycled Water (PRW) and river release to avoid costly wastewater network expansions in Western Sydney.*

The way that Sydney Water plans for growth in its investment analysis is described in Section 4.5.2, and we confirm that both standard NSW growth forecasts and more localised developer based intelligence have been incorporated into the growth forecasts that have been used. Where the need to service growth interacts with existing capacity in strategic assets and transfers then Sydney Water has used the growth forecasts to understand the point at which spare capacity can no longer be relied upon, and tailored the timing of its solutions to meet those threshold points.

Sydney Water has also carried out a significant amount of moderation in its assessments of need and costing, as described in Section 4.5.3, and has assumed that PRW is an acceptable solution when developing water and wastewater management proposals, even though this carries some risks around customer and regulator acceptance. We can therefore confirm that Sydney Water has sought to balance the costs of managing growth against the costs to existing customers. **However, the growth information that effectively drives their proposals is incorporates developer intelligence, and schemes are timed to avoid the risk of causing delays to any of the development areas**. During the interviews Sydney Water expressed a low appetite for risk associated with potentially delaying any development due to concerns over the risk of reputational damage.

Within Section 4.5. we have therefore sought to provide scenarios that take a more balanced approach to managing growth risk, where budgets are only set in line with the average expectations of costs that could be required to manage strategic growth forecasts. The proposed scenarios also recognise that there may have to be difficult budgetary decisions made during the Determination Period to balance growth risk across different regions.

The development and rationale of our scenarios are presented in Section 4.5.6, but effectively these represent a position where there is a risk that growth in some local areas could be temporarily constrained if:

- There are unanticipated increases in growth;
- Growth tracks towards the more optimistic developer forecasts; or
- Sydney Water is not able to manage the overall budget between regions in a suitably flexible way.

2.3.3 Procurement

Because of the increasing levels of capex and the move towards larger growth and enhancement projects (rather than the 'infill' projects that were common in previous price controls), Sydney Water has been working on and changing its procurement practices throughout the current 2020-2025 period. Sydney Water provided us with presentations and evidence that it is starting to implement very mature procurement practices, particularly in relation to major projects and area based work programs. Sydney Water also demonstrated that it has been able to widen its supplier base (including Tier 1 and Tier 2 contractors), introducing more competition and less reliance on single suppliers for less common installations such as reverse osmosis plant.

This will both enable Sydney Water to deliver the larger volumes of work that are forecast and introduce efficiencies into the procurement process. The analyses presented to us indicated that it would be reasonable to expect those procurement changes to deliver efficiencies in the order of 10%, across a significant proportion of the capital program. These are not reflected in the current cost estimates for all projects. The IIP team has therefore proposed a 7% stepped change efficiency across the whole capital program (for the 2025-2035 period), which is reflective of the presentations provided to us on procurement. Where Sydney Water has identified larger potential changes to its procurement processes, primarily in relation to strategic infrastructure and large programs of work (such as area based growth servicing), then larger targets of 9-10% have been proposed in the shorter term over Period 1. The efficiencies proposed do therefore appear reasonable at a high level.

Sydney Water has demonstrated increasing maturity in procurement and program delivery, particularly in relation to major projects (mainly growth related) and regional level delivery strategies. However, there are a number of factors that mean program delivery delays could still occur:

- Currently Sydney Water does not monitor outturn-to-estimate scheduling performance, so we were not able to confirm schedule delivery capability across the recent portfolio. We consider it would be very useful for Sydney Water to monitor and continually improve schedule estimation performance, to give greater confidence in the timing of delivery and therefore spend.
- The mix of projects proposed places a greater emphasis on constructing new treatment facilities, in which Sydney Water has less experience, and which are generally more prone to delay than business as usual schemes.
- Data provided in RFI193 also showed that state-wide constraints on infrastructure contracts are likely to continue, as the pressures from the cross-sector program are due to stay high for at least the first half of Period 1.

This means that some slippage/delay is feasible or even inevitable. This is discussed further in Section 4.10.3.

3. Detailed review of operating expenditure

3.1 Summary of findings

This chapter presents a review of Sydney Water's proposed operating expenditure (opex).

Current period

Sydney Water has met the 0.8% p.a. efficiency target set at the 2020 Determination and operating expenditure in the current period (FY21 to FY24) was 1.4% below the IPART Determination allowance (excluding bulk supplies). There has been an increasing trend in expenditure from a low in FY21 which Sydney Water attributes to the impact of Covid. FY25, whilst outside the Determination period, shows a marginal increase above the FY24 outturn, although still within the Determination envelope; that is the additional expenditure in 2025 is less than the overall savings in the current period.

The water performance measures were largely achieved except for one water quality failure at the Orchard Hills plant and leakage performance. Sydney Water continues to experience non-compliance at some water resource recovery plants. There were exceedances of the dry weather flows for some networks and pollution and environment incidents.

Bulk water volumes were 7.6% lower than the IPART 2020 assumption due to lower demand. Costs were slightly higher than the allowance because of the greater use of the Sydney Desalination Plant (SDP) because of deteriorating colour and turbidity levels in the raw water from WaterNSW.

Year 2025

We included year 2025 in the base, trend, step analysis and concluded that efficient expenditure was in the range $1255M for the upper scenario and $1241M in the lower scenario, including non-controllable costs except for bulk water. This compares with the 2024 base year of $1245M respectively.

Future period

Sydney Water has proposed future expenditure using the Base, Trend and Step (BTS) approach as defined in the IPART Handbook. Overall, it has proposed an 18% real terms increase in opex from FY24 to FY30.

The expenditure proposals are presented in the SIR BTS worksheet. We understand that this was prepared using the earlier Regulatory Cost Model (RCM) whilst the AIR opex sheets used the most recent SAP system. The main differences relate to how corporate expenditure is allocated. For the purposes of this expenditure review, we have used the SIR BTS worksheet; our findings are included in versions of this worksheet.

Within the BTS methodology, we have established an efficient base expenditure and range of efficient expenditures for each trend or step from an upper to lower range. Our review has focused on controllable costs. Sydney Water assumes that bulk volume requirements and related costs are non-controllable. This is not entirely correct where leakage is above the economic level and significant volume savings are expected from the digital metering program. In essence, the volume requirements can be maintained at the base year level while supplying more customers. With the implementation of the pre-treatment process works in 2028 (upper scenario) to reduce the impact of deteriorating raw water quality on the plants, there should be less dependency on the SDP to respond to water quality events.

We have agreed with Sydney Water's use of FY24 as the base year. In its submission, Sydney Water has made some adjustments to reflect year end positions. We found that additional electricity grid supplies had to be purchased due to outages on renewables. We also found that in a constrained market, that is the lower scenario, we would not expect vacancy rates to change. This gives a base year upper scenario of $1,196M and lower scenario of $1,191M.

The three biggest differences between our view and Sydney Water's proposals relate to:

- The proposed trend growth rate assumed by Sydney Water is greater than our view; see the paragraph below.
- Water and wastewater maintenance: Sydney Water has included a step increase above base in maintenance expenditure where we consider asset performance is generally stable. We consider that most of this step increase is not justified.
- Digitalisation: Sydney Water has proposed an increase in expenditure of $159M. We are supportive of nearly all of this step increase in expenditure adjusting it in the upper range to net off FY24 expenditure and amend cloud service costs. We have also considered a benchmarking approach for the lower range of expenditure which would reduce the proposed increase.

Trend expenditure combines measures of growth, efficiency and real price effects into one combined percentage for meeting growth and efficiency targets with no exogenous factors driving costs. Sydney Water has based its trend assumptions on the growth rate of residential and commercial properties; that is 1.2% to 1.5% for FY25 to 30[12]. This assumes that all expenditure is driven mainly by growth in connections when it impacts mainly on electricity, chemicals, customer service and relative price effects. An assumption is made on efficiencies from base year expenditure which is marginally less than achieved in the current period. The Real Price Effect (RPE) assumptions are derived from independent economic analysis.

For the water sector, we show that there is no material impact of new properties on bulk water volumes. In the current period, there was no material increase in costs when demand was increasing at a similar rate as forecast. For the upper scenario, we concluded that, for the water sector, a growth rate of 0.7% per annum reflects the likely increase in costs in servicing growth. A higher 1.0% growth for the wastewater sector is applied as this is driving more treatment costs. The upper scenario also assumed efficiency at 0.7% per annum and the RPE as proposed. The lower scenario assumes the same 0.8% efficiency as applied in the current period from 2022, zero growth as also applied in the current period and a constrained labour market where RPE is not applied.

We see Step expenditure as that driven by external regulators or other bodies through additional regulation or change in standards. In addition, where new capital assets are constructed and have a material impact on operating expenditure. We have accepted these step changes and tested the efficiency of the expenditures proposed to derive upper and lower scenarios. Sydney Water has applied a broad assumption to 'Step' and includes additional expenditure to maintain existing water and wastewater assets.

Sydney Water propose a continuation of the digitisation program and associated IT developments which we generally support.

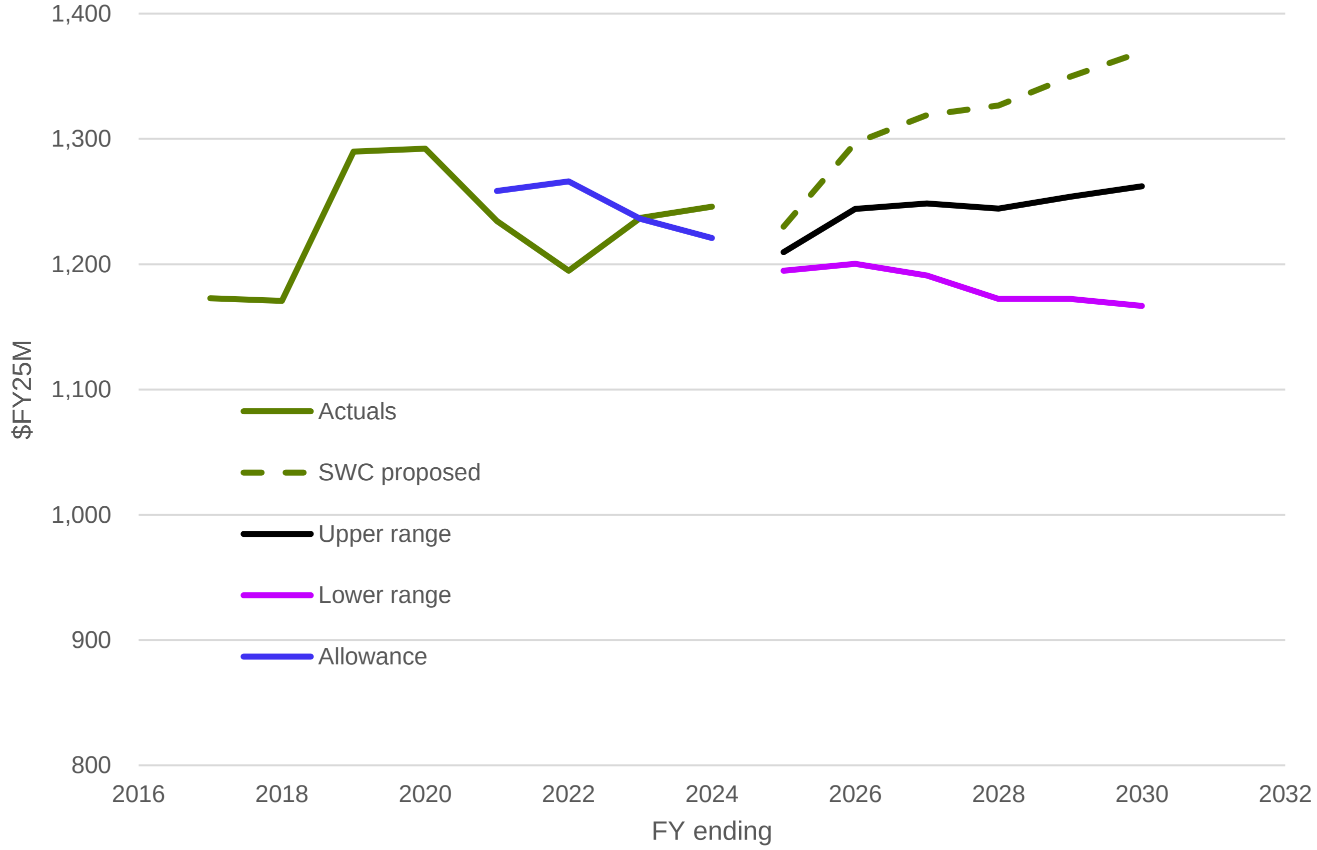
Other step changes are proposed by Sydney Water where their net impact is not material. We have in general not reviewed these but question whether there should be a materiality test to their inclusion.

[12] Figure quoted is for water and wastewater. The equivalent figure for stormwater is 1.0% to 1.5% excluding Rouse Hill and Mamre Road/Aerotropolis

For each material Step expenditure, we have reviewed the detailed proposals presented to us. We have excluded those areas of expenditure not justified to derive an upper scenario. We have then considered a constrained market condition to derive a lower scenario. The results of our review can be seen clearly in Figure 3-1 below.

The recommended core opex based on the adjustments we have applied is summarised below. The upper range represents an average core opex of $1251M p.a. (in FY26-30) or 6% below Sydney Water's proposal. The lower range makes an average core opex of $1181M p.a. or 11% lower than the proposal.

Figure 3-1 – Upper and lower scenario expenditure profiles compared with Sydney Water proposals



Source: SIR BTS and Atkinsrealis analysis

Note: these costs do not include bulk supply costs as these will be sent as part of the WaterNSW Greater Sydney Determination

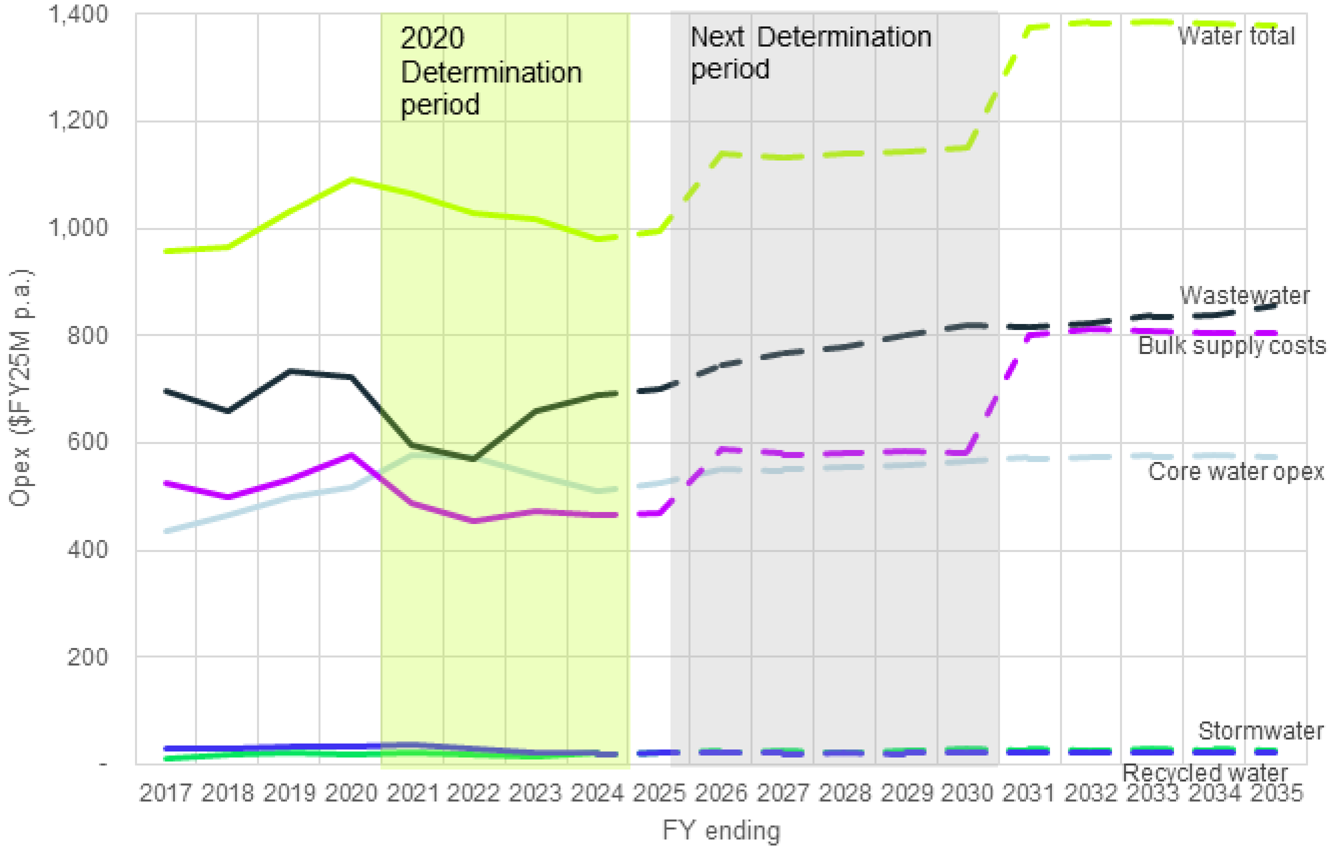
This section of the report explains the reasons why we recommend the levels of expenditure represented by the upper and lower scenarios.

3.2 Context

Sydney Water provides water, wastewater, recycled water and stormwater services to its customers. Whilst water opex is the largest component, this includes payments for purchase of 'bulk water' from WaterNSW and Sydney Desalination Plant for example. After removing these bulk supply costs the remaining water opex is lower than for the wastewater service.

As is discussed in further detail below, wastewater opex has been on an increasing trend since 2022, and one which Sydney Water largely proposes to maintain. Meanwhile, core water opex (excluding bulk supply) has been on a reducing trend in recent years and is projected to see a more modest increase than wastewater. However, Sydney Water projects a significant increase in bulk supply costs leading to these surpassing the remainder of water opex.

Figure 3-2 – Trends in operating expenditure by service



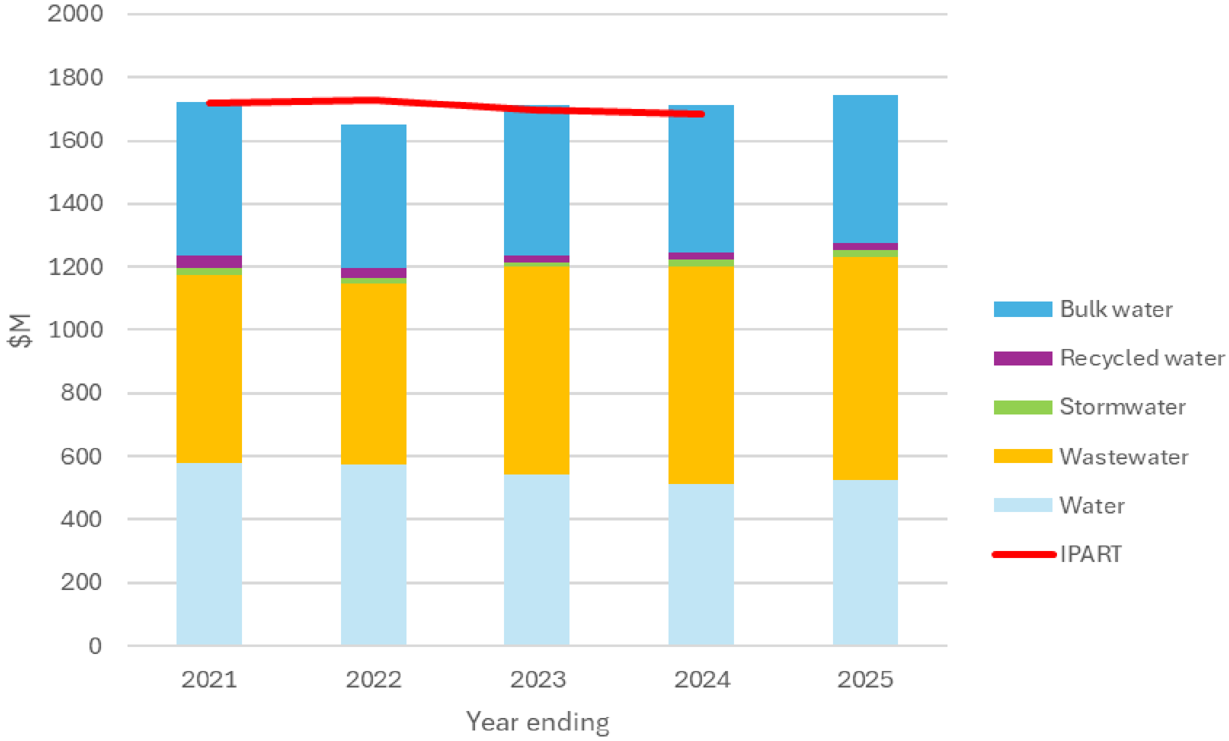
Source: Analysis of 2020 and 2025 AIR/SIR

The following sections examine opex in the current period and Sydney Water's proposed opex before then outlining our recommended expenditure scenarios for the Tribunal's consideration.

3.3 Operating expenditure in the current period

Sydney Water was set a core operating expenditure allowance of $4,982M (in $FY25) for the period 2021 to 2024, excluding bulk water expenditure. This included a continuing and cumulative efficiency of 0.8% per annum from 2022.The outturn core expenditure was $4,912M, or 1% below that set by the Determination. The profile of actual expenditure compared with the Determination (including bulk water) is shown in Figure 3-3 below.

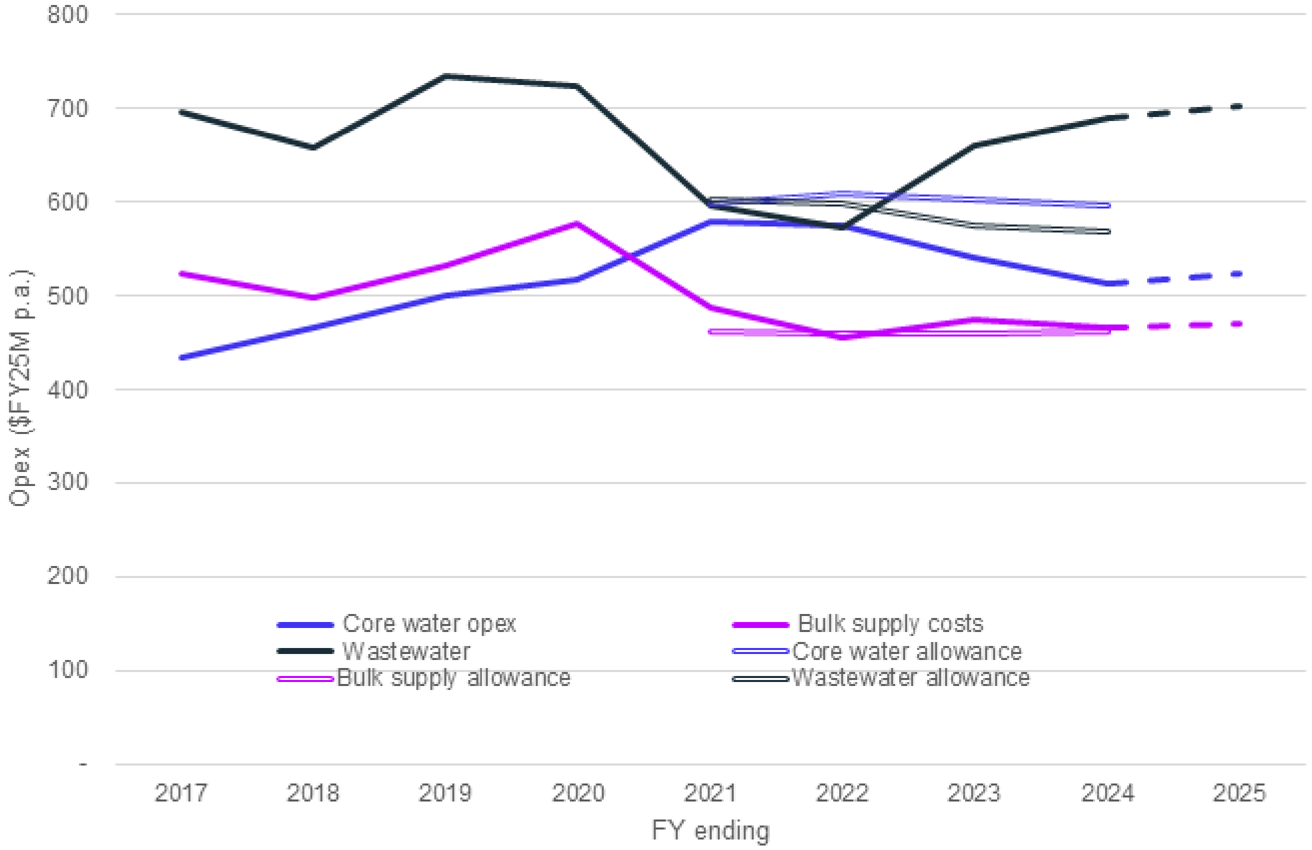
Figure 3-3 - Total operating expenditure by function 2021 to 2025 and variance with the 2020 determination



Source: Sydney Water IPART submission Table 7.1 and AtkinsRéalis analysis

Expenditure on the core water service reduced by 12% over the period 2021 to 2024 whilst wastewater expenditure increased by 16%. Sydney Water has explained that more resources were allocated to wastewater activities when the drought labour costs were not required in later years.

Figure 3-4 – Water and wastewater opex comparison to the 2020 Determination allowance



Source: Analysis of 2020 and 2025 AIR/SIR

Sydney Water also explained that expenditure in 2022 was lower than planned due to the Covid restrictions which limited the fieldwork caried out in that year. Working practices returned to normal in 2023 and 2024 when wastewater activities increased above pre-Covid levels although water activities continued to reduce.

The financial year ending 2025 (FY25) was not part of IPART's 2020 Determination but has been assessed to understand the trends in expenditure. Sydney Water projects a 2% real terms increase in total controllable expenditure compared with FY24. If we assume that FY25 has the same determination allowance as FY24, the combined variance of the period FY21 to FY25 would be -$16M or c0.3% below the IPART allowance.

We understand that expenditure for FY23 and FY24 was derived from the new SAP system using its cost allocation model. Previous years are understood to have been based on the earlier Regulated Cost Model. The change in allocation rules from FY23 makes it difficult to establish reliable trends in expenditure by function over the period for some items. An example is the allocation of corporate expenditure to service areas in the SAP system which results in a significant reported reduction in FY23 and FY24. However, some trends are clearly evident.

Expenditure by cost type as reported by Sydney Water in its submission is shown in Table 3-1.

Table 3-1 - Current period variance analysis by cost type (core opex)

$FY25M Year ending	2021	2022	2023	2024	2025
Labour	215	214	257	343	350
Employee provisions	62	47	67	90	91
External consultants and/or contractors	360	340	276	333	304
Plant and fleet	10	0	0	0	0
Build Own and Operate (BOO) plants	117	114	117	116	128
Licence fees	17	21	25	14	16
Materials	56	41	79	54	58
Energy	56	57	56	60	81
Operating leases	39	35	33	35	42
Other	90	30	188	140	169
Corporate	212	296	139	60	36
Total core opex	1234	1195	1237	1246	1275

Source: Sydney Water submission Table 7.3

There is a significant increase in labour and employee provisions from $277M in FY21 to $433M in FY24. Sydney Water explained that Covid has a significant impact through FY21 and FY22. Later increases in 2024 are understood to relate to FTE increases, higher salary costs and increases in superannuation contributions. There was also a one-off cost of living payment made in 2024.

The variations in service contractors are understood to relate to increases in maintenance activities offset in part by lower digitisation costs, meter reading and revenue collection and consulting costs.

Bulk water volumes were 7.6% below forecast. However, bulk supply costs were 2% above the Determination allowance because of greater use of the SDP. This is discussed in Section 3.4.2.2. There is a reported even trend in Build Own and Operate (BOO) water filtration plants to FY24 when we understand that there were significant chemical cost increases due to the deteriorating raw water quality followed by a step increase in FY25 which we understand to relate to increasing chemical costs.

We note that digital project expenditure was capitalised in FY21 but expensed and reported as operating expenditure from FY22. This represents an increase in operating expenditure of $1.1M in FY22 to $6.5M in FY24. In FY25, expenditure is projected to increase to $15.8M.

Material costs show some significant variations which Sydney Water attributes to increasing chemical costs because of supply constraints driving higher unit costs although this has now stabilised.

Energy consumption costs were 6.3 GWh (0.4%) above the Determination assumption over the F21 to FY24 period. Expenditure was $45.2M (23%) above the assumption, of which $26.8M was attributable to price, $0.9M to increased demand and $17.5M to renewals outages. There were particular outages at the Prospect hydropower and co-generation units at Malabar and North Head plants. In the base year 2024, renewables output was 28.4 GWh less than assumed in the Determination, equivalent to c$4.7M. A 7.3 GWh ($1.2M) increase in demand is projected in FY25 due mainly to new processes at West Camden wastewater treatment plant and three new water pumping stations.

There are significant variances in 'Other' and 'Corporate' which are partly attributable to changes in cost allocations.

Summary

Sydney Water's outturn operating expenditure for the current period was below the 2020 determination allowance. Efficiencies set at that time were achieved. It has effective internal controls to manage and prioritise expenditure within the determination envelope; for example, managing the impact of Covid early in the period and increasing the labour inputs to address backlog work following this event. We concluded that the expenditure was appropriate, and adequate and managed within the determination envelope. We found no examples where operating expenditure was imprudent.

3.3.1 Organisation structure

Sydney Water's structure was reorganised in 2024 to reflect the focus on customer outcomes with the three outcomes of customer experience, water quality and reliability, and environmental protection. The current structure is formed of five divisions, namely:

- Customer experience;
- Water and Environment;
- Infrastructure delivery;
- People and governance;
- Financial, commercial and digital.

This change has reduced the number of divisions as the previous structure comprised nine divisions.

3.3.2 Delivery of service standards

Table 3-2 below summarises performance against key performance measures in the 2020 Determination period. The targets have been met in all years for three of the seven metrics and not achieved for all or most of the years for the remaining four.

In terms of the water service, Sydney Water has achieved the performance standards for water continuity and pressure but leakage is above the mean economic level. Water quality has been fully compliant against health and aesthetic parameters except for one Trihalomethane (THM) failure at the Orchard Hills plant due to poor raw water quality.

For the wastewater service, the dry weather wastewater overflow standard from networks has also been achieved although performance on sewage dry weather overflows from sewage pumping stations and from sewage treatment systems has not been achieved. Wastewater treatment plants have not been fully compliant for load and concentration measures although performance has improved over the period.

Table 3-2 – Performance measures

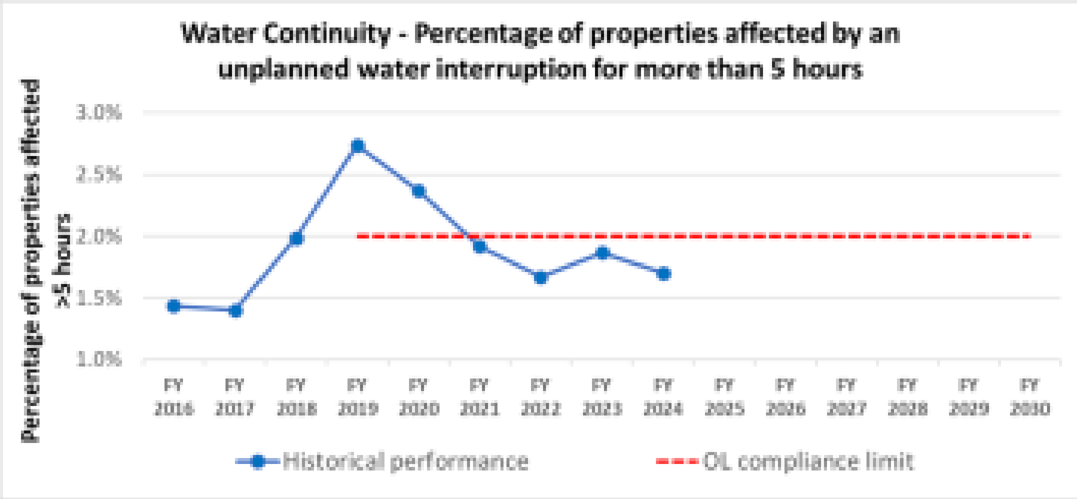
	Performance Measure	FY21	FY22	FY23	FY24	5 Year Trend
	Water					
OL	**Water Continuity** Standard - Properties affected by unplanned interruptions (>5hrs) in a financial year	■ (green)	■ (green)	■ (green)	■ (green)	↓ (green)
OL	**Water Pressure** Standard - Properties affected by more than 12 pressure failures in a financial year	■ (green)	■ (green)	■ (green)	■ (green)	≈
OL	**Water Leakage -** Water leakage from System	■ (red)	■ (red)	■ (red)	■ (red)	↑ (red)
	Wastewater					
OL	**Dry Weather Wastewater Overflow Standard** Uncontrolled wastewater overflow - No. of properties unaffected by dry weather overflow	■ (green)	■ (green)	■ (green)	■ (green)	↓ (green)
EPL	**L1.4 - Dry Weather Overflows** from Sewage Pumping Station	■ (green)	■ (red)	■ (red)	■ (red)	↓ (green)
EPL	**L7.4 Dry Weather Overflows** to waterways – Sewage Treatment Systems non-compliant	■ (red)	■ (red)	■ (red)	■ (red)	↑ (red)
EPL	**Load and Concentration** Non compliances	■ (red)	■ (red)	■ (red)	■ (amber)	↓ (green)

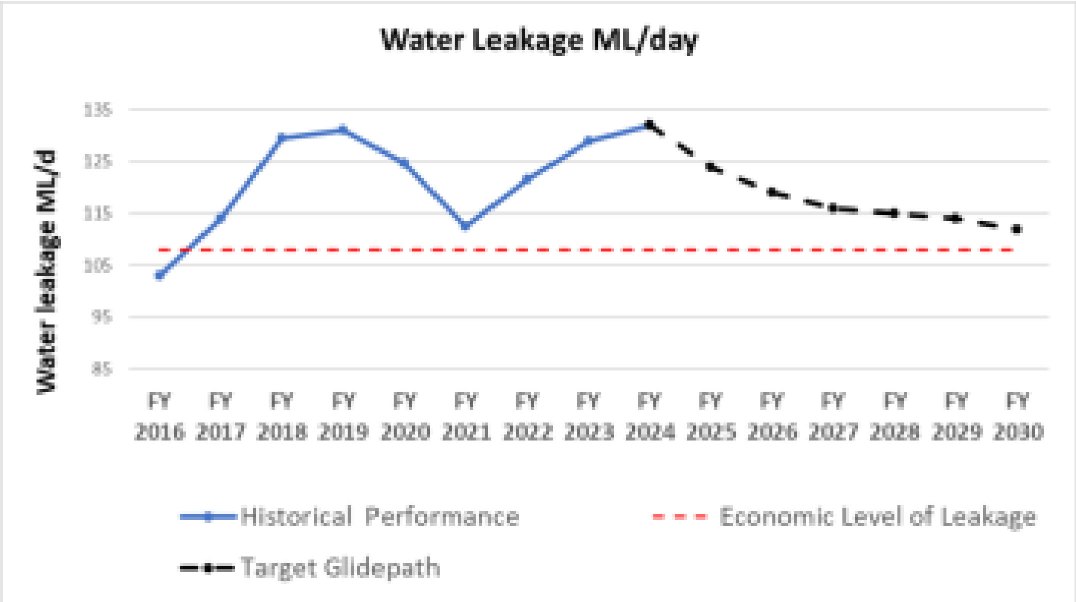
■ (green) Target achieved.
↓↑ (green) Favourable or positive trend
■ (red) Target not achieved.
↓↑ (red) Unfavourable or negative trend

Source: Sydney Water Presentation D-1E , OL and EPL measures

Water continuity standard, that is the percentage of properties having an unplanned interruption greater than five hours, is a significant driver for maintenance expenditure and capital renewals. Whilst Sydney Water achieved the standard there was little headroom in some years as shown in Figure 3-5.

Figure 3-5 - Water continuity and leakage performance



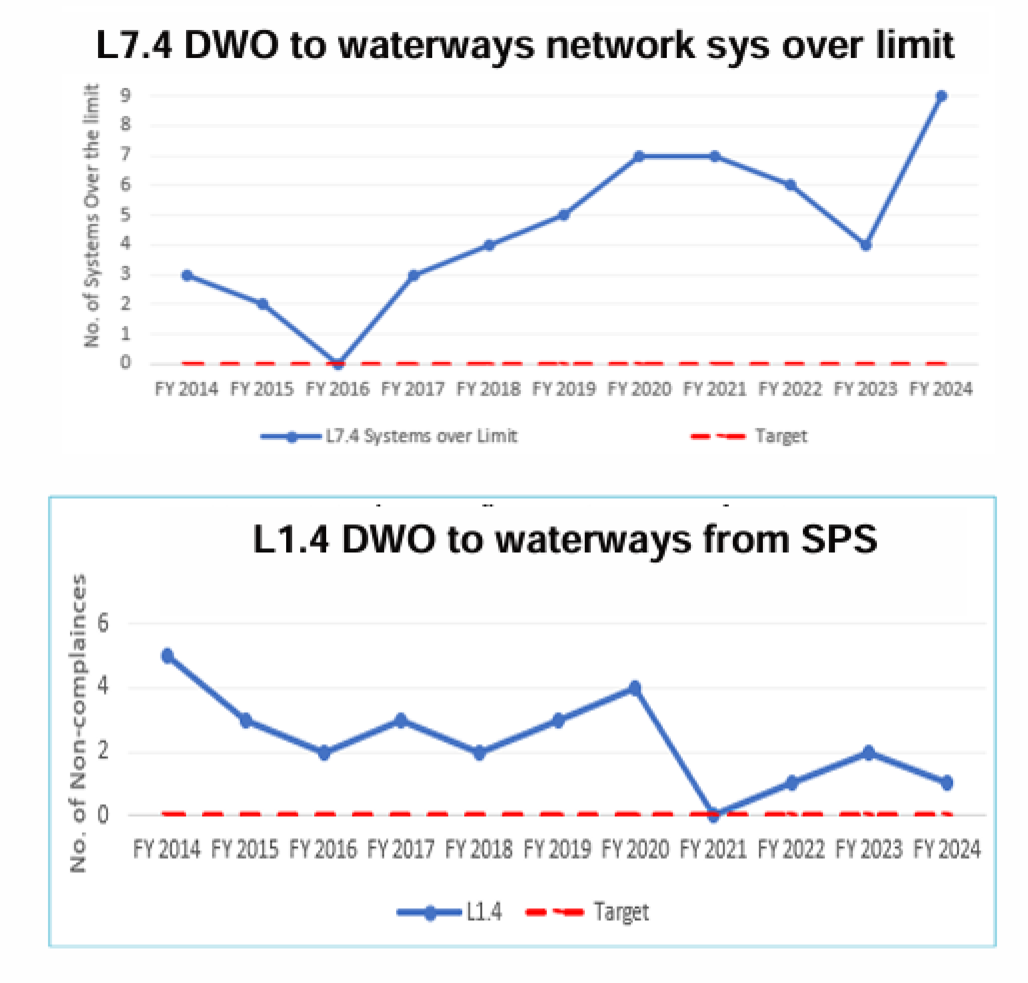


Source: Presentation D-1E

The high numbers of properties affected related to a small number of events, mainly trunk or large distribution main failures affecting large numbers of properties. For example, 18,000 properties were affected by one event in 2019 where a 500mm trunk main failed. There was also a similar failure on the same main in 2022.

Wastewater performance trends over the current period are shown in Figure 3-6.

Figure 3-6 - Wastewater dry weather overflow (DWO) performance



Source: Presentation D-1E

There was a reducing trend in waste system DWOs over the period 2021 to 2023 but a marked rise in 2024. Conversely there is a reducing trend in dry weather overflows from sewage pumping stations. However, despite these improving trends, bot remain outside compliance targets.

The rolling six-month average number of pollution incidents shown in Figure 3-7 show a cyclic pattern with peaks in July and troughs in January from 2021 to 2024. This shows a slightly rising trend in incident numbers. Sydney Water assumes a year 2024 upper limit of 1,053 incidents continuing at this level through to 2030. The number of sewer chokes show a reducing trend to January 2023 then rises to July 2024. Sydney Water attributes the recent rising trend to wetter weather conditions.

Figure 3-7 – Pollution and environmental harm incidents

Source: Presentation D-1E

3.4 Proposed operating expenditure

We have assessed and provide recommendations on the efficient level of proposed operating expenditure. Under the 3Cs framework, businesses use a 'base-trend-step approach to calculating operating expenditure. That is, expenditure will be made up of:

a. Base – the efficient recurring expenditure required each year (reflecting genuine recurring expenditure and taking into account an efficient business's costs on average over the range of likely conditions over the period.)

b. Step – changes that are typically the result of new requirements or new ways of doing things, so past expenditure or trends cannot predict this change in expenditure.

c. Trend – the predictable change in recurring expenditure over time due to input price changes, population/demand growth and improvements in productivity.

We have reviewed all three components, assessing whether assumptions are reasonable, and costs are efficient. Our review includes the assessment of the base year efficient costs and comment on reasons for adjustments.

In making its recommendations, we have considered how a reasonably efficient business in a reasonably competitive market might respond to the challenges of those market forces over time. This may include considering how a business in that environment would:

- have sought to optimise its mix of operating cost inputs;
- invest in business efficiency initiatives and systems;
- seek to engage with third-party providers, or in this case the private sector.

We set out our findings in the following sections.

3.4.1 Proposed Expenditure

3.4.1.1 Overview

Sydney Water has submitted future operating expenditure using the base, trend, step approach set out by IPART in its Handbook. Overall it has proposed an 18% real terms increase in opex from FY24 to FY30.

Expenditure has been categorised as ‘controllable’ or ‘non-controllable’; the latter including bulk water supplies, licence fees and land taxes. The profile of proposed future expenditure is shown in Table 3-3.

Table 3-3 – Proposed operating expenditure from the 2024 base year

Year ending June ($FY25M)	2024	2025	2026	2027	2028	2029	2030	Total 2026 to 2030
Water controllable	458.2	471.3	495.6	500.6	501.3	505.6	510.6	2513.8
Water non-controllable	481.3	487.1	609.9	605.0	608.5	611.7	614.8	3049.9
Total water	939.5	958.3	1105.5	1105.6	1109.8	1117.3	1125.4	5563.6
Wastewater controllable	498.9	524.5	544.7	564.8	570.8	590.6	602.1	2872.9
Wastewater non-controllable	27.4	28.4	29.2	30.4	32.4	34.0	36.8	162.8
Total wastewater	526.3	552.9	573.9	595.2	603.2	624.6	638.8	3035.7
Stormwater controllable	16.2	14.5	18.7	18.7	18.9	19.1	19.2	94.6
Stormwater non-controllable	0.4	0.3	0.5	0.5	0.6	0.6	0.7	3.0
Total stormwater	16.6	14.8	19.2	19.3	19.5	19.7	19.9	97.5
Corporate controllable	223.2	219.7	237.7	234.8	235.8	234.4	237.7	1180.3
Corporate non-controllable	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Corporate	223.2	219.7	237.7	234.8	235.8	234.4	237.7	1180.3
Total proposed	**1705.5**	**1745.8**	**1936.3**	**1954.9**	**1968.2**	**1996.0**	**2021.8**	**9877.2**

Source: “SIR Opex 2 bts”

This table is derived from the “SIR Opex 2 bts” worksheet which we understand has been prepared using the previous Regulatory Cost Model. We note that it is not consistent with the AIR “Opex by function” worksheet which has been prepared using the new SAP allocation process from 2023 onwards. The main differences relate to the allocation of corporate expenditure to the water and wastewater services. We asked Sydney Water (RFI262) if it is possible to re-present “SIR Opex2 bts” using the new cost allocation process as this would make future monitoring easier to follow.

Sydney Water advised that they are expecting to make a $25M contribution to the Climate Change Fund (CCF) over the period 2026 to 2030. This has yet to be confirmed. This amount has not been included in non-controllable costs.

Sydney Water had reviewed the analysis required and proposed a methodology as set out below:

1. *Obtain the weightings used to allocate corporate costs to water, wastewater, stormwater and recycled water (and any non-regulated and unregulated business) in our AIR from our Cost Model and then, to apply these to the corporate costs compiled in our SIR BTS.*

2. Apply a further single, line-item adjustment to our forecast water, wastewater, stormwater and recycled water opex in our SIR BTS to ensure it further matches our forecast opex by product in our AIR. We note that this proposed approach does not seek to use the corporate costs produced by the Cost Model, nor to re-conduct a new BTS on the SIR. We estimate that the proposed approach would require about a week for our team to conduct.

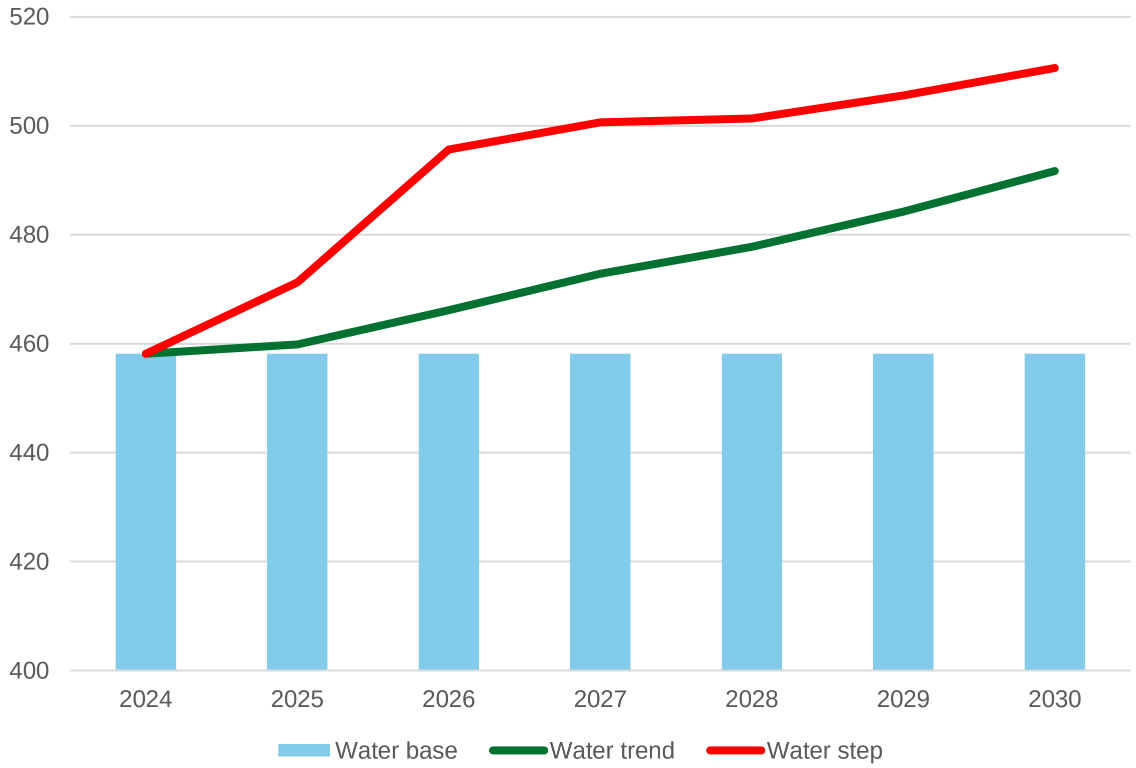
In the "SIR Opex 2 bts" worksheet Sydney Water has proposed a base year negative (i.e. downwards) adjustment of $7.2M. It has then proposed an increase of $316M p.a. (18.5%) above the adjusted 2024 base by 2030 which is a combination of proposed 'trend' and 'step' increases. Water controllable expenditure shows an increase of $52.4M p.a. by 2030, an increase of 8.2% over the period. Wastewater shows an increase in controllable expenditure to $103.2M p.a. or 21% over the period.

The proposed expenditure includes an allowance for continuing efficiency. We discuss the reasons for these expenditures and our view on efficient levels of expenditure in the following sections. We have reviewed the expenditure proposals using the base, trend and step approach as set out in the IPART Handbook[13].

The largest non-controllable expenditures are the bulk water charges from WaterNSW and the Sydney Desalination Plant (SDP). For the purposes of this efficiency review, we have examined the volume assumptions from these bulk water sources but not the unit charges which are subject to separate price reviews. Bulk water is discussed in Section 3.4.2.2. Other non-controllable expenditure includes council rates, taxes and licence fees. Our review set out in the following sections is based on controllable expenditure using the base, trend and step approach.

The impact of the trend and step expenditures for the water service are shown in Figure 3-8 below.

Figure 3-8 - Trend and step water service expenditure proposals from the 2024 base



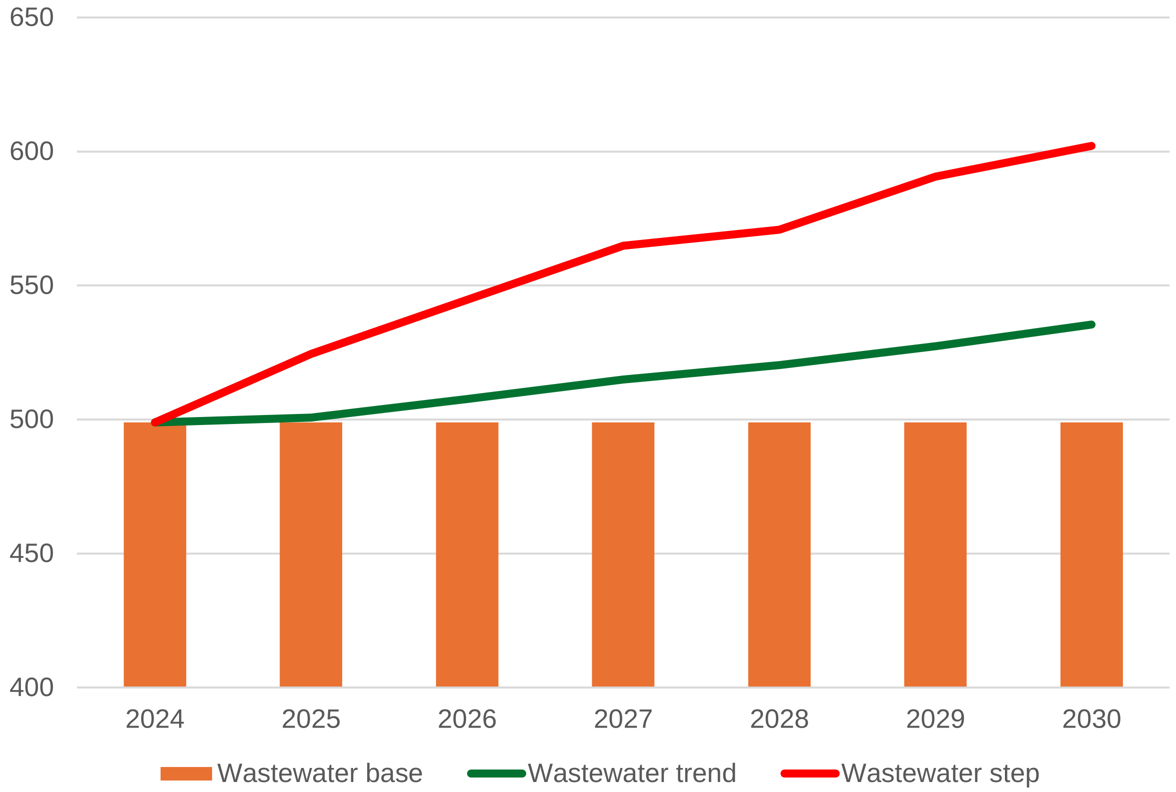
[13] Water regulation handbook, July 2023, IPART

Source: SIR Opex 2 bts sheet and AtkinsRéalis analysis; note the x-axis starts at $400M to show the impact of trend and step expenditures.

The base year 2024 has been adjusted to reflect an average or typical year. This is discussed in Section 3.4.2. The increasing trend in core water expenditure represents a 1.2% per annum increase from the 2024 base. This increase comprises increases in chemical and power costs and real price effects for labour and maintenance. This percentage increase is close to the increase in property numbers forecast for the period. We discuss these increases in Section 3.4.3.

The step increase shows an average 9.7% increase on the 2024 base year. This increase reflects specific items identified by Sydney Water which it says meets the definition of a step change. We discuss these increases in Section 3.4.5.

Figure 3-9 - Trend and step wastewater service expenditure proposals from the 2024 base



*

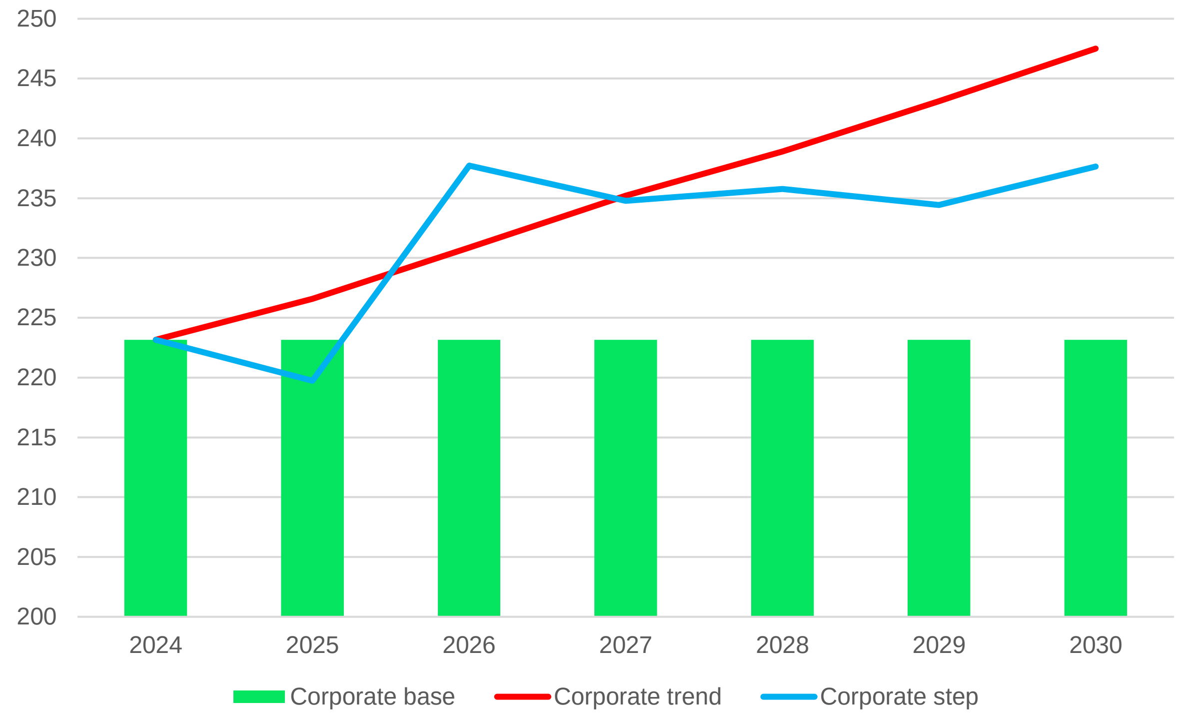
Source: SIR bts sheet and AtkinsRéalis analysis

The increasing trend in wastewater expenditure is similar to the water service at 1.2% per annum over the period for similar escalation of electricity, chemicals and biosolids. The step increases over the period represent an annual average increase of 11%.

Stormwater expenditure shows an increasing 1.2% per annum trend in expenditure and a step increase of an average $2M per annum over the period.

Corporate expenditure shows a similar increase in trend and step expenditure as shown in Figure 3-10 below. There is a 1.8% per annum trend increase which is notable as we would expect to see corporate costs to be relatively independent of growth. Step expenditure includes a relatively high proportion of digital opex and is sensitive to the efficiency assumptions across the period. This may explain the unusual expenditure profile. With the efficiencies proposed we might expect to see corporate expenditure reduce in the future period.

Figure 3-10 - Trend and step corporate expenditure proposals from the 2024 base



Source: SIR opex bts and AtkinsRéalis analysis

Controllable expenditure is shown in Table 3-4 allocated to base, trend and step drivers consistent with the IPART Handbook.

Table 3-4 - Summary of proposed Base, Trend and Step changes ($F25M)

Driver	2024	2025	2026	2027	2028	2029	2030	Total 2026 to 2030
Base	1196.4	1196.4	1196.4	1196.4	1196.4	1196.4	1196.4	5981.9
Trend		7.1	24.6	43.2	57.4	75.4	95.5	296.1
Step		26.5	75.7	79.3	73.0	77.9	77.6	383.5
Total		1229.9	1296.7	1318.9	1326.8	1349.7	1369.5	6661.6

Source: SIR BTS and AtkinsRéalis analysis

There is an assumption that the base year and future years to 2030 relate to average weather conditions. Annual average rainfall varies across the region from 800 mm to 1200 mm. In 2024, rainfall records to date suggest that the year is above average.

3.4.2 Base expenditure

The base is defined as the current efficient level of recurrent controllable opex[14]. For the current period FY21 to FY24, Sydney Water was set a controllable opex determination of $4,982M and outturned at $4,912M, an overall

[14] Water Regulation Handbook, IPART July 2023

underspend of 1%. However, core opex in FY24 was $25M above the 2024 Determination allowance (excluding bulk water supplies) or $30M including bulk water.

We comment in Section 3.4.2.1 below on Sydney Water's assessment of an average year and adjustments made to the actual 2024 outturn expenditure.

Sydney Water is responsible for water demand forecasts built up from projections of residential and non-residential properties. This drives forecasts of bulk demand from WaterNSW and the Sydney Desalination Plant (SDP). In Section 3.4.2.2. we discuss bulk supplies, which are mainly non-controllable. However, Sydney Water is able to marginally reduce bulk water demand through activities such as the digital meter program, leakage management and water conservation activities.

3.4.2.1 Base year adjustments

The base year is assumed to be an efficient level of expenditure in a 'normal' year; that is, not influenced by drought or excessive rainfall. FY24 has been described as a 'boring' year in that it was close to average, with Sydney Water achieving all performance measures except for treated wastewater discharges. The IPART Handbook states:

> *Baseline opex reflects the business's efficient recurrent controllable opex in the second last year of the current determination period.... The baseline opex would be adjusted to:*
>
> *• remove non-controllable expenditure items to be forecast separately, as noted above;*
>
> *• remove one-off or non-recurring expenditure items incurred in the base year, or add normally occurring items that were not incurred in the base year;*
>
> *• remove additional cost savings or efficiency improvements expected or committed to in the final year of the current determination period, including any continuing efficiency improvement expectations set by IPART for the current period.*
>
> *We would expect the pricing proposal to demonstrate the efficiency of the adjusted baseline opex (e.g., using benchmarking analysis), and provide justification for the adjustments and explain any deviations from the base-year opex allowance previously determined by IPART.*

The analysis below is based on controllable total expenditure. Sydney Water has proposed a number of opex adjustments as summarised in Table 3-5 below*.

Table 3-5 - Baseline adjustments proposed by Sydney Water

$M 24 unless shown	Water	Wastewater	Stormwater	Corporate	Total
Total controllable expenditure	449.6	488.2	15.7	215.3	1,168.7
Cost of Living payment	-0.9	-2.9			-3.8
Labour vacancies	0.8	1.5		1.3	3.5
Change in project delivery	-6.0				-6.0
One-off project costs	-0.6				-0.6
Actuals FY24 adjustment	2.0	1.1	0.0	0.1	3.2
Uniform - Safety policy changes		-0.2			-0.2
Increase in major periodic maintenance (MPM) program		-5.0			-5.0
One-off trucking costs biosolids and storage due to wet weather		-1.9			-1.9
Prior year credits (Ventshafts, CCTV, Waste disposal)		2.6			2.6
Adjustment for large network repair jobs funded out of capex		1.5			1.5
One -off project costs		-0.6			-0.6
Total adjustment	-4.8	-3.8	0.0	1.4	-7.2
Adjusted 2024 base year	444.8	484.4	15.7	216.7	1,161.5
Normalised base year at $M25	458.2	498.9	16.2	223.2	1,196.4

Source: SIR BTS and AtkinsRéalis analysis. Note: Numbers may not add up due to rounding.

In the year, a one-off cost of living payment was made to all staff reflected in the $3.8M reduction in the base year adjustments. This has been reversed for the normalised base year.

We understand that the initial totals were based on the March 2024 forecast for FY24 and as such adjustments (‘actuals FY24 adjustment’) have been applied to reflect the year-end outturn expenditure.

Conversely there is a $3.5M addition due to unfilled vacancies above the 2.5% vacancy rate assumed in a normal year. This is a Sydney Water assumption and is subject to management decisions.

Adjustments for operational activities shown in Table 3.5 above resulted in a $7.0M higher outturn of water expenditure and a $3.6M higher wastewater expenditure. Hence the efficient base year expenditure is reduced by $10.6M.

Efficient base year expenditure

We have confirmed the adjustments applied by Sydney Water appear appropriate in that they are what we expect to see and to the levels proposed, subject to any update of the actuals for FY24.

We think that there is a reasonable case to consider a further adjustment related to the renewable power supplies that were not operable during FY24 due to outages. Sydney Water has confirmed that the outage for FY24 was 5.5 GWh (RFI1180). This resulted in an additional power purchase of $0.9M from the grid. This means that a normalised FY24 expenditure should be reduced by the same amount.

In a low range scenario and a constrained market, we would expect that management would not increase the headcount hence no positive adjustment would be applied to the FY24 expenditure for labour vacancies. A summary of the low range scenario adjustments is shown in Table 3-6 below.

Table 3-6 - Low and upper range scenario adjustments

$FY25M	Water	Wastewater	Stormwater	Corporate	Total
Sydney Water Adjusted base year	458.2	498.9	16.2	223.2	1196.4
AtkinsRéalis upper scenario					
Less for low renewable generation	-0.5	-0.5			-0.9
Less for water conservation	-1.0				-1.0
Upper scenario base year	456.7	498.5	16.2	223.2	1194.5
AtkinsRéalis lower scenario					
Less no allowance for vacancies	-0.8	-1.5		-1.4	-3.6
Less for water conservation	-2.0				-2.0
Lower scenario base year	455.4	497.4	16.2	221.9	1190.9

Source: AtkinsRéalis analysis. Note: numbers may not sum due to rounding

3.4.2.2 Bulk water

Immediately before the current period, the Sydney area experienced a significant drought which triggered full production from the SDP from September 2019. The drought broke in early 2020 and was followed by wet weather events in 2022 and 2023. This resulted in deteriorating raw water quality in the impounding reservoirs. Sydney Water issued Emergency Response Notices (ERNs) to SDP to maintain production with the ability to ramp up for emergencies. Bulk supply volumes are shown in Table 3-6 below with SDP supplies increasing from 22 Gl p.a. in 2022 to 68 Gl p.a. in 2023 and reducing in 2024.

Over the period there was 7.6% lower total bulk water volumes compared with the 2020 Determination assumptions due to lower demand than forecast. However, costs increased because of greater use of the SDP, for 20 events because of the poor raw water quality or operational outages in the supply network. In the base year 2024, actual volumes were 5.7% below forecast whilst costs were 1% above the Determination assumption.

In 2025, Sydney Water projects total volume to 546 Gl, similar to 2024.

Table 3-7 - Bulk water supplies in the current period

Year ending $FY25M		units	2021	2022	2023	2024	Total 2021 to 2024
IPART Determination							
	WNSW costs	$M	244	245	245	246	980
	SDP costs	$M	217	215	215	216	863
Actual							
	WNSW costs	$M	236	223	219	230	908
	WNSW vols	Gl	504	489	460	515	1967

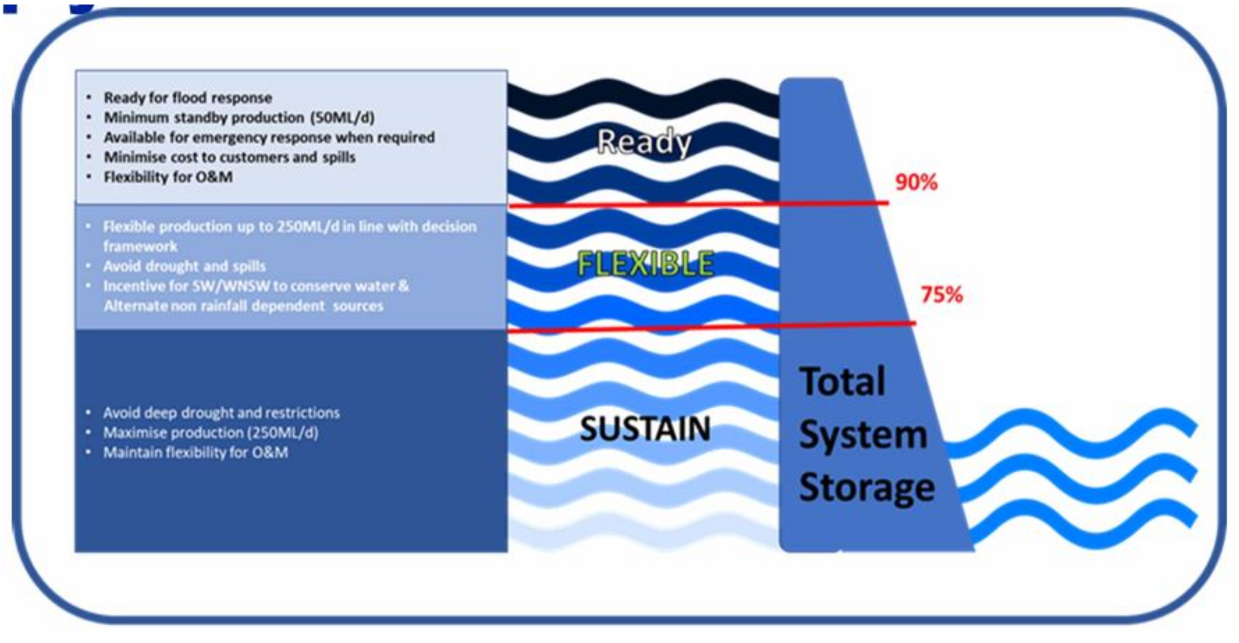
	SDP costs	$M	250	231	255	237	973
	SDP fixed costs	$M	234	207	205	205	851
	SDP usage costs	$M	16	24	50	32	122
	SDP volumes	Gl	20	22	68	36	146
	Total volumes	Gl	524	511	528	551	2114
Variance							
	WNSW costs	$M	-8	-22	-26	-16	-72
	SDP costs	$M	33	16	40	21	110
	Period variance	$M					38

Source: Sydney Water Submission table 7.2 and AtkinsRéalis analysis. Note: numbers may not sum due to rounding

The SDP was operated from September 2019 to March 2020. Thereafter it operated in response to 17 ERNs with eight due to rainfall events impacting on raw water quality, five related to the relining of Potts Hill reservoir and four related to operational events. Output varied from 50 Ml/d to 250 Ml/d.

Forecast bulk supplies are based on the Greater Sydney Operating Strategy which relates to storage levels in the reservoirs. The operating rules depend on three scenarios as illustrated in Figure 3-11 below.

Figure 3-11 - Decision framework for dam storage and SDP operation



Ready – when reservoir storage is >90% with minimum 50 Ml/d standby production and available for emergency response as required.

Flexible – when reservoir storage is 75% to 90% with flexible production up to 250 Ml/d in line with decision making and the incentive to conserve water and use of non-rain dependent sources

Steady - when reservoir storage is < 75% with SDP at maximum 250 Ml/d and avoid restrictions and deep drought.

The WaterNSW WATHNET model has been used to generate the percentage of time at various storage scenarios as shown in Table 3-8.

Table 3-8 - Forecast output from the SDP

Year ending	output (Ml/d)	2026	2027	2028	2029	2030
Storage >90%	50	62%	63%	62%	60%	61%
Storage 90% to 75%	125	23%	24%	24%	25%	26%
Storage <75	250	15%	14%	15%	15%	15%
Total production (Gl)		35.5	35.2	35.4	36.0	36.0
Water quality events (Gl)	250	7	7	7	7	7
Total production (Gl)		42.5	42.2	42.4	43.0	43.0
Upper scenario						
28 days for WQ events (Gl)	250	7	7	7	7	7
Total production (Gl)		42.5	42.2	42.4	43.0	43.0
Low scenario						
7 days for WQ events (Gl)	250	2	2	2	2	2
Total production (Gl)		37.5	37.2	37.4	38.0	38.0

Source: Sydney Water Presentation 3D, AtkinsRéalis analysis

Sydney Water proposals for use of the SDP included an allowance for water quality and operational events should the need arise. It assumed that to cover these emergencies, the SDP would operate at full 250 Ml/d capacity for 28 days in a year. This is equivalent to 7 Gl/a over the period or 8% of full production over the year. We consider that Sydney Water has taken a low-risk approach to the likelihood of these water quality and operational events.

We did not include a range of assumptions in our report. We have now taken the opportunity to consider this and think that a range may be appropriate. We think that the 28 day (7 Gl/a) assumption represents a reasonable ‘upper’ scenario and 7 days (2 Gl/a rounded) represents a reasonable ‘lower’ scenario. These scenarios are shown in Table 3.8 above.

The impact of the pre-treatment processes has not been included as the new pre-treatment facilities will only be operating after 2028. One of the benefits of the pre-treatment process is to reduce reliance on the SDP and assume a lower value from 2028, We have included this assumption and reduced SDP volumes in Table 3-9 where the SDP supply from 2028 is 2 Gl/a less than the Sydney Water proposal.

Forecast output from WaterNSW and SDP is shown in Table 3-9. Forecast production from the SDP is similar to the average 37 Gl p.a. actual use in the current period. SDP use is based on the modelling which is an appropriate method to forecast bulk water requirements over the long run.

Sydney Water has not assumed any supply from the SDP expansion works. The modelling assumes up to 250 Ml/d in the worst case scenario where storage is less than 75%.

Sydney Water assumes that the current high level of colour and turbidity will continue into the future period. Given the catchment conditions, it is prudent to assume that poor water quality will continue although may be marginally improved. Year 2025 to date estimates higher BOO costs because of the raw water quality. With the commissioning in the pre-treatment processes in 2028, the impact on the BOO plant will be reduced.

Table 3-9 - Forecast output from WaterNSW and the SDP

Year ending		2024	2025	2026	2027	2028	2029	2030
Upper scenario								
Volume from WNSW	GL	514.9	505.5	499.9	502.2	510.3	513.3	518.1
SDP supply	GL	36.0	36.0	42.5	42.2	40.4	41.0	41.0
Total supply	GL	550.9	541.5	542.4	544.4	550.7	554.3	559.1
Lower scenario								
Volume from WNSW	GL	514.9	505.5	504.9	507.2	513.3	516.3	521.1
SDP supply	GL	36.0	36.0	37.5	37.2	37.4	38.0	38.0
Total supply	GL	550.9	541.5	542.4	544.4	550.7	554.3	559.1
Total demand	Gl	551.0	546.1	542.4	544.4	550.6	554.3	559.1

Source: Presentation 3D,AIR/SIR Table 2 and AtkinsRéalis analysis

The forecasting methodology is set out in Section 10 of the submission. While we have not reviewed the detailed forecast, we comment on a number of the assumptions underlying the figures:

- Water usage: the impact of price rises from June 2025 is assumed to reduce water consumption in FY26 and FY27.
- Leakage: in FY24 is at 130 Ml/d and is above the economic level (ELL). Sydney Water forecasts to reduce to the ELL of 105 Ml/d by 2034. Sydney Water plans to reduce leakage to 108 Ml/d by 2033. From interpolation, by 2030, leakage is expected to be about 112 Ml/d. This is a modest and inefficient rate of reduction given the cost of water supplied by the SDP. We comment in Section 3.4.2.5 below on leakage performance.
- Water conservation: The current $10M p.a. program is set to deliver 9.68 Gl of new savings by 2030 (excluding savings from the smart metering program, price changes and DCEEWW led policy changes). We discuss this in Section 3.4.2.4.
- The resulting demand profile shows a relatively level profile to 2030 with an increase from 2024 to 2030 of only 9.2 Gl, equivalent to 0.28% p.a. We note that electricity and chemical costs follow a similar profile.

Sydney Water advised that the digital metering program will deliver estimated savings of $54.5M from customer service leakage savings and $1.1M from network savings through the period 2026 to 2030. This is equivalent to bulk water savings of 17.8 Gl over the future period. These savings are phased over the period to 2030 as shown in Table 3-10 below.

Table 3-10 - Bulk water savings from the digital metering program

		2026	2027	2028	2029	2030
Customer-side leaks (CSL)						
Customer-Side Leakage Reduction - Residential	$M	1.8	5.1	8.7	12.6	16.4
Customer-Side Leakage Reduction - Non-residential		0.4	1.1	1.9	2.8	3.6
Non-revenue water (NRW)						
Network Leakage Reduction - Management Improvements			0.1	0.2	0.3	0.5
Total CSL/NRW savings (ex rebate)		**2.2**	**6.3**	**10.9**	**15.7**	**20.5**
Value used to convert volumes to $ savings	$/kl	3.12				
Volumetric savings	**GL p.a.**	**0.72**	**2.01**	**3.48**	**5.03**	**6.58**

Source: RFI162 and AtkinsRéalis analysis

The bulk water forecasts have been adjusted to reflect the savings from the digital metering program as summarised in Table 3-11. These savings are deducted from the WaterNSW supply. This is because the SDP supply is used to supplement poor raw water quality and any operational outages in the supply network.

Table 3-11 – Recommended bulk water forecast

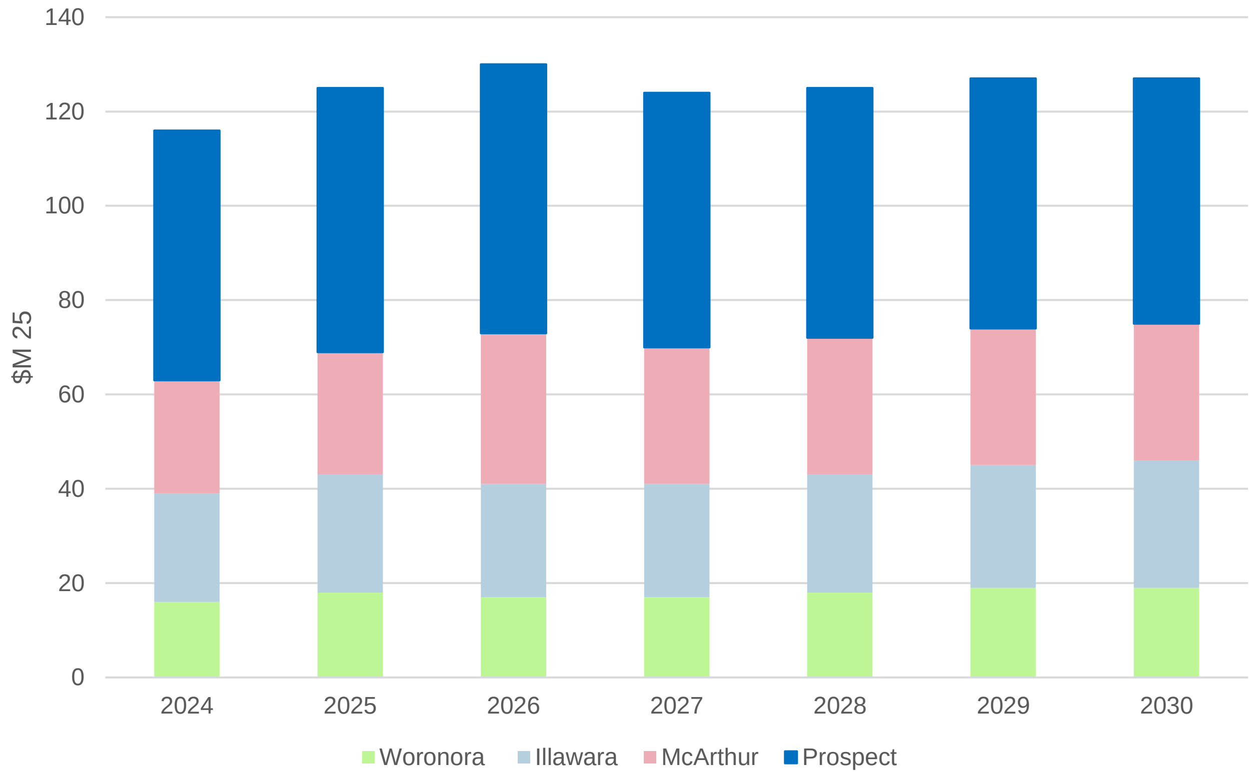
Year ending (GL)	2026	2027	2028	2029	2030
WNSW supply	499.9	502.2	508.3	511.3	516.1
Metering program	-0.7	-2.0	-3.5	-5.0	-6.6
Net WNSW supply	499.2	500.1	504.8	506.2	509.5
SDP supply	39.5	39.2	38.0	38.0	39.0
Total demand	538.7	539.4	542.8	544.2	548.5

Source RFI162 and AtkinsRéalis analysis

3.4.2.3 BOO costs

Build Own and Operate (BOO) costs relate to water treatment plants at Prospect, McArthur, Illawara and Woronora. Expenditure shows an even trend over the current period similar to the efficient level set in the 2020 Determination. Expenditure in FY24 was $116M. Prospect is by far the largest plant. However, forecasts to FY30 show a significant increase on the FY24 base year as shown below.

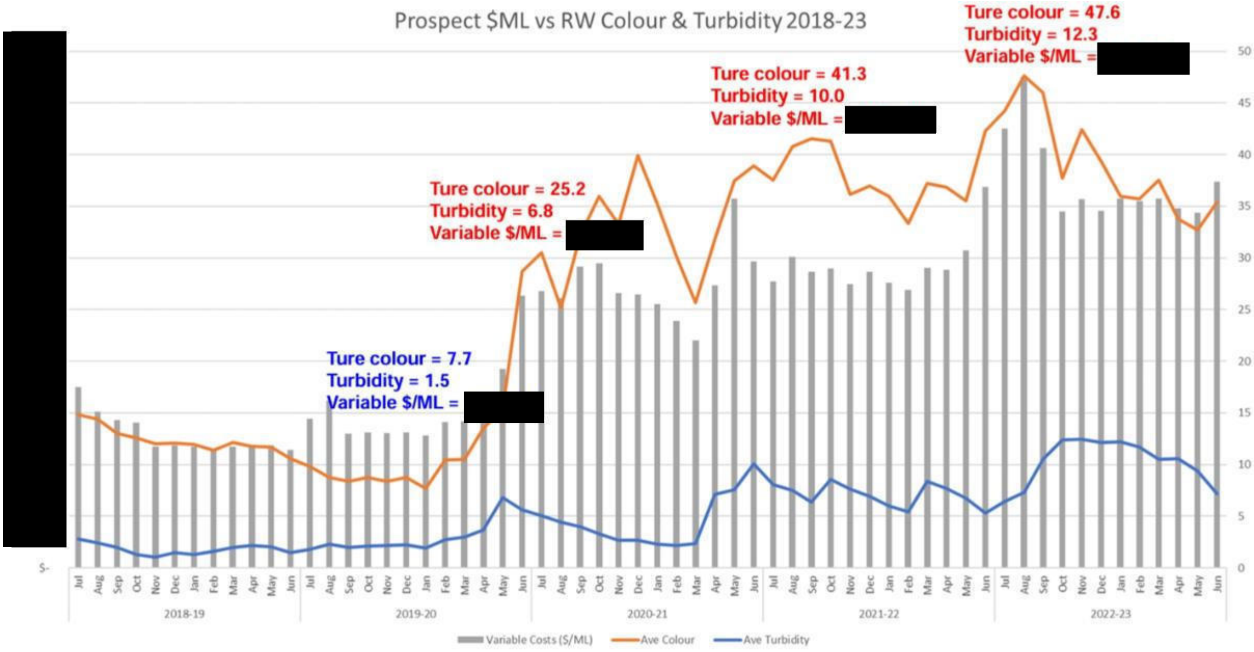
Figure 3-12 - Actual and forecast BOO costs



Source: Presentation 3D and Sydney Water submission Table 7.3

Sydney Water explained the deteriorating raw water quality from the WaterNSW reservoirs and the need to carefully manage the draw-offs for abstractions. These treatment works operate with direct filtration and no pre-treatment although a new process is being constructed in the future period. There were significant increases in colour over the current period requiring more frequent filter backwashing. We understand that payments to the BOO plant operators are based on raw water quality – colour and turbidity – energy and chemicals. The increase in colour and turbidity over the current period at the Prospect Works are shown in Figure 3-13 below. This shows the variable cost in $/Ml based on varying colour and turbidity levels.

Figure 3-13 - Prospect plant – water quality FY19 to FY23



Source: Presentation 3D

Before the drought broke in January 2020, low levels of colour and turbidity were experienced, and a base treatment cost of [redacted] was incurred. This increased to [redacted] when colour reached 25 hazen and to [redacted] at colour of 40 hazen. Figure 3-13 shows that high colour was experienced from 2020 over the current period.

Sydney Water is constructing a pre-treatment process at Prospect which it will operate, not the BOO contractor. This is designed to remove colour and turbidity on half the flow through the Prospect plant, assuming blending of pre-treated water and deliver water to the BOO contractor with colour and turbidity levels at the lowest treatment band. From Figure 3-13 this is colour less than 7.7 Hazen and turbidity less than 1.5 NTU. We would then expect to see BOO costs at or near to the pre-high colour event.

The capex review includes the Prospect pre-treatment in the upper scenario but not in the lower scenario. Should the latter be selected then the current high BOO costs from treatment of high colour and turbidity water would continue, and the need to supplement bulk water from the SDP with 2 Gl/a would be required.

3.4.2.4 Water Conservation

Sydney Water has a licence requirement to maintain a water conservation plan consistent with the Greater Sydney Water Strategy (GSWS). It has a five-year plan and reports annually on activities, water savings and expenditure. There is a GSWS water efficiency target to save 38GL of drinking water by 2030. An Economic Level of Water Conservation (ELWC) has been established to determine which activities are cost beneficial and should be promoted.

Water efficiency activities through the current period up to the end of 2023-24 have delivered around 24 GlA of drinking water savings towards the GSWS water efficiency target. The impact of water savings in the 2017-2020 drought have been achieved by customer behaviour. In 2024, savings of 1.5 GLA are reported against a target of 1.9 GLA with an expenditure of $9.2M. The main areas of saving are from the Water Fix program in residential, strata and commercial properties which delivered 88% of the savings for 60% of the costs. Project management formed 35% of the costs. Sydney Water subsequently explained that these costs include field teams, water conservation activities and research and support to the leakage detection program. In addition, the Waterwise campaigns incurred $5.2M with no savings reported. Sydney Water commented that it was difficult to quantify the benefits. The savings do not take into account the natural increase in leakage over years.

Forecast activities over the period to 2030 are similar to the current program. In addition, there are forecast savings from implementation of the smart metering program and reduced demand from the impact of higher water tariffs. Conversely, leakage tends to grow over time and while it is valid to report on water savings from these initiatives, it is likely that losses may be increasing in areas not covered by the water conservation activities.

The greatest saving is from repairing concealed leaks found during the digital meter pilot program as identified in the project reports. With the wider implementation of the digital meter program, there are examples of plumbing losses which have been found and repaired. Experience in the UK suggests that significant leaks and plumbing losses may be detected and make a significant contribution to water savings. The level of savings reported here is small and we have used information from the digital metering program to estimate losses detected and repaired. We discuss this in Section 3.4.2.2 above.

In addition, about half the forecast savings relate to residential and non-residential pricing and incentives. We question whether these savings are permanent or just a response to increases in pricing where customer behaviour may revert to previous levels. There is no cost allocated to this activity.

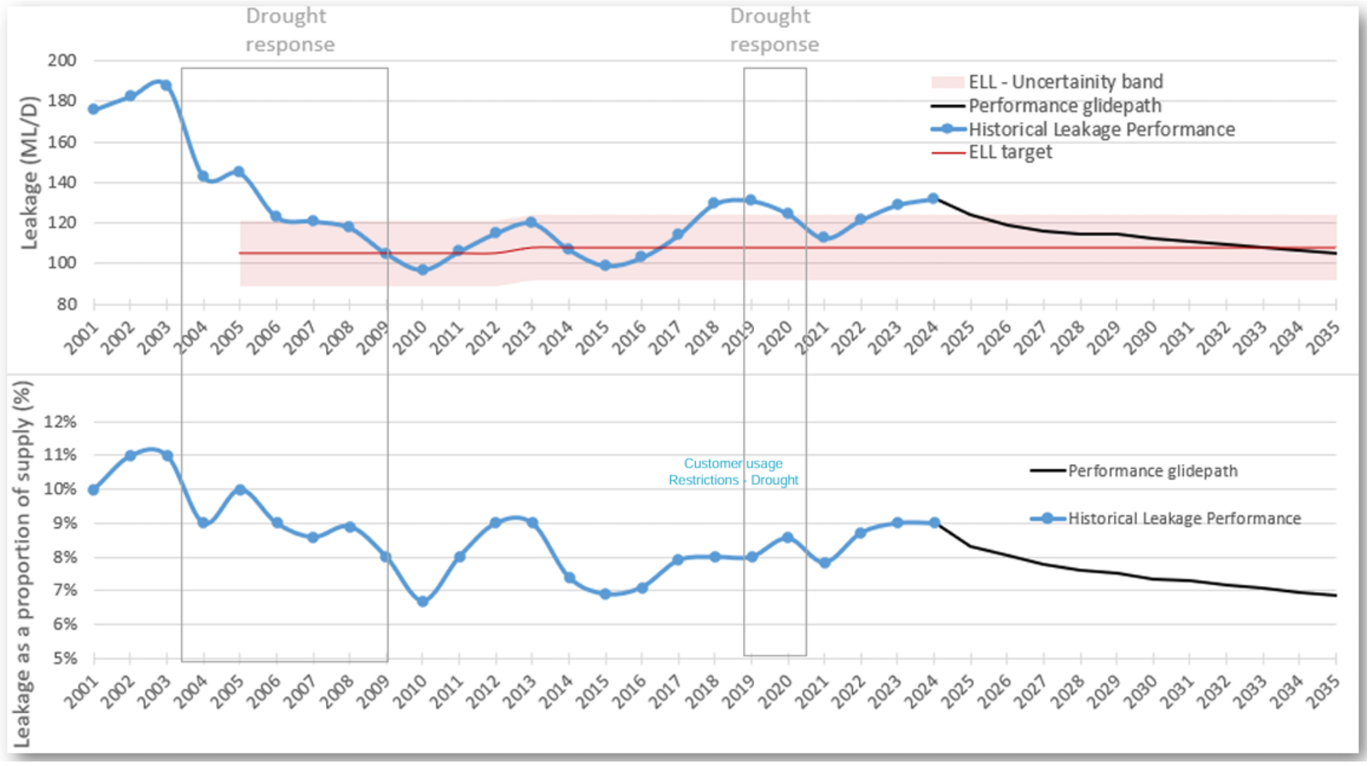
Expenditure is forecast to continue through the future period at the current rate of $10M p.a. although only $9.2M was incurred in the base year 2024. Water saving activities are consistent with the ELWC. However, project management costs have increased significantly compared with the 2020 determination. We note that the Waterwise program and its costs are included in future expenditure forecasts.

We conclude that there is scope to deliver water savings through focusing on those least cost activities including the digital metering program which is funded from outside the water conservation program. There is an opportunity to apply efficiencies to the program and its management costs. We therefore propose an efficient annual expenditure of $9M p.a. for the upper and $8M p.a. for the lower scenario. We have included this in the base year adjustment.

3.4.2.5 Leakage

Leakage performance over the period since 2001 is shown in Figure 3-14 below expressed as Ml/d against the economic level of leakage and expressed as percentage of supply.

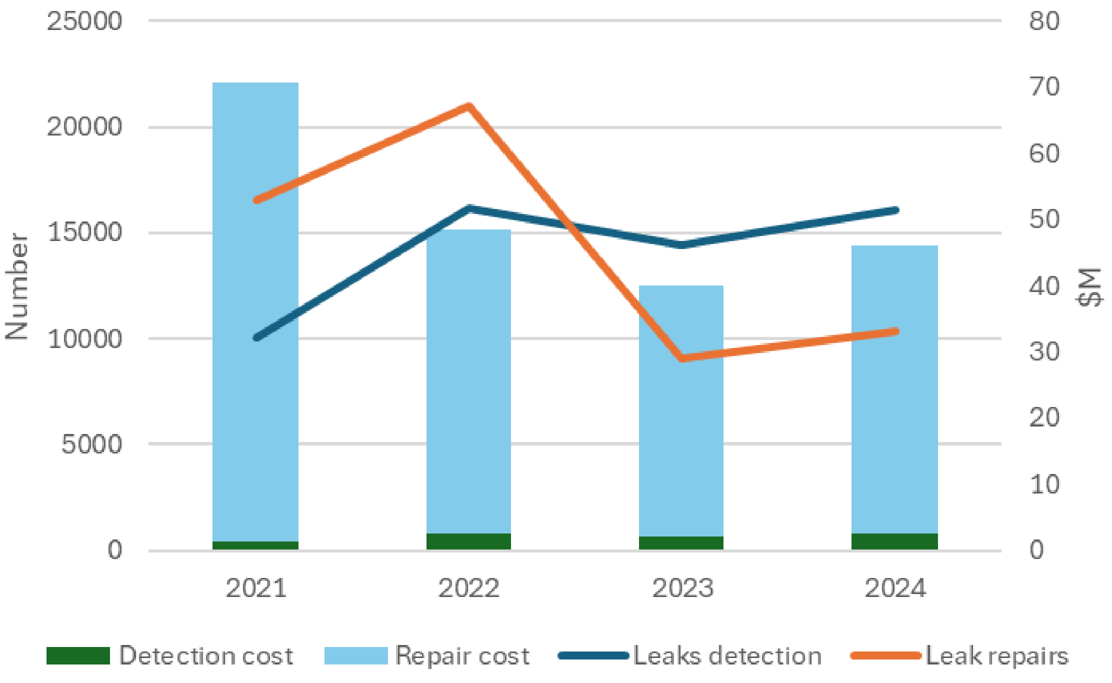
Figure 3-14 - Actual and forecast leakage performance against economic level



Source: Presentation 3J

There has been a long-term leakage reduction over the period. However, during the current period from 2021 to 2024, leakage has increased from 110 Ml/d just after the drought to 132 Ml/d, some 24 Ml/d above the mean ELL. During the period, inputs, i.e. active leak detection and repair activities, have reduced, as has expenditure, as shown in Figure 3-15.

Figure 3-15 - Leakage detection and repair over the current period



Source: Sydney Water Presentation 3J

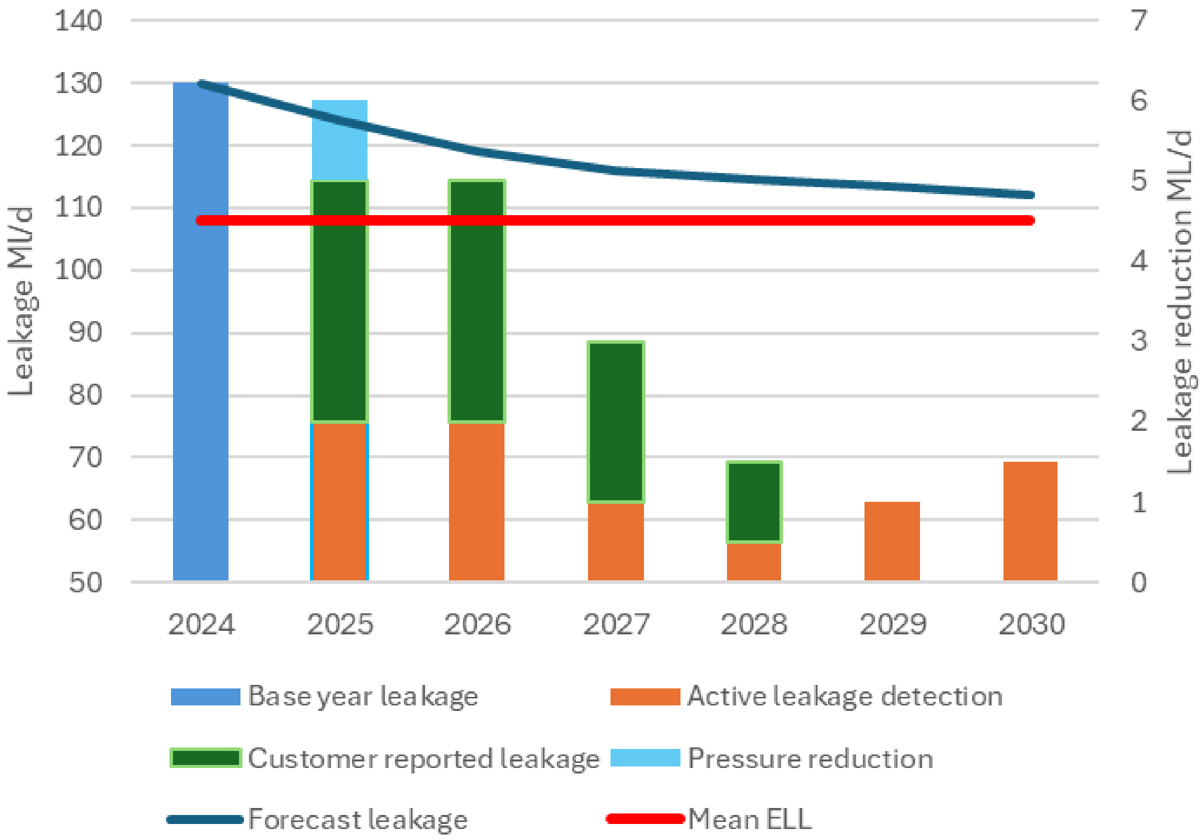
Forecast leakage reduction activity comprises pressure reduction, active leakage detection and customer reported network leaks and reactive repairs on request from customers as shown in Figure 3-16. With these activities, Sydney Water is proposing to reduce leakage to 112 Ml/d by 2030. Pressure reduction shows a 1 Ml/d reduction to 2035. This seems surprising as we would expect further savings when this is normally an efficient method of leakage reduction. This was discussed at the 2020 efficiency review when proposals were seen to establish District Meter Areas (DMAs) and pressure management areas. It appears that these earlier plans were not implemented.

Leakage reduction through identifying plumbing losses and leaks on customer properties shows a total reduction of 9 Ml/d over the period. With the implementation of the digital metering of the project we would expect to see a larger leakage reduction in residential and commercial properties continuing through the period.

Active leakage detection and repair activities show an 8 Ml/d reduction over the period which is equivalent to 1.6 Ml/d over the 5-year period. Efficient leakage detection requires the leaks to be repaired as soon as practicable within performance standards which reflect the urgency of the system. Repair costs are reported through maintenance expenditure. Sydney Water is implementing a new ‘Flow’ process which should deliver efficiencies in the leakage repair process and enable a shorter response time to locate and repair water mains.

Figure 3-16 shows how the reducing leakage target can be achieved through a combination of pressure reduction, customer service pipe leakage savings and active leakage control.

Figure 3-16 - Leakage reduction, ELL and leak repair types



Source: Sydney Water Presentation 3J

We formed the view that the focus on leakage management over the current period has been limited and reported leakage has been allowed to rise over the period. We consider this likely to be inefficient as (a) there is a greater cost for leakage reduction on a higher basis than for maintaining at a lower level and (b) the marginal cost of bulk water supply is quite high especially with significant desalination use (and as demonstrated by the fact that leakage is above the ELL).

The plans for leakage management through DMAs presented in 2020 have not been implemented. The forecast activities and technical resources are available for reducing leakage to the ELL but the targets are far from challenging. It is likely that the savings from the residential and commercial supply pipe repairs, identified from the digital metering program will provide further total leakage reductions.

We propose that the mean ELL of 108 Ml/d should be achieved by 2028 and maintained at that level through the period. By definition this should be economic giving a saving of 3.5 Gl over the period.

3.4.3 Trend expenditure

The trend is defined as any predictable change in the efficient level of recurrent controllable opex due to output growth, productivity improvements and real input price changes. The IPART Handbook comments that:

> *We expect businesses to propose a trend component that is applied to baseline expenditure to roll forward a reasonable baseline for the determination period. This trend component would reflect:*

- *The business's proposed efficiency factor for controllable opex productivity improvement.*
- *A meaningful measure of output growth, such as growth of customer connections or volume delivered.*

- *Expected real changes in input prices of rolled forward baseline costs – that is, where the combined effect of input price changes is expected to diverge significantly from forecast changes in the consumer price index. We model prices in real terms, so businesses can propose a trend factor relative to general price levels. — Where a business is seeking a higher input price adjustment for these reasons, the business would demonstrate that the increase is not offset by decreases in input prices for other cost items.*

Sydney Water is proposing trend expenditure in all services as summarised in Table 3-12 below. These forecasts are net of proposed efficiency.

Table 3-12 - Trend expenditure by service

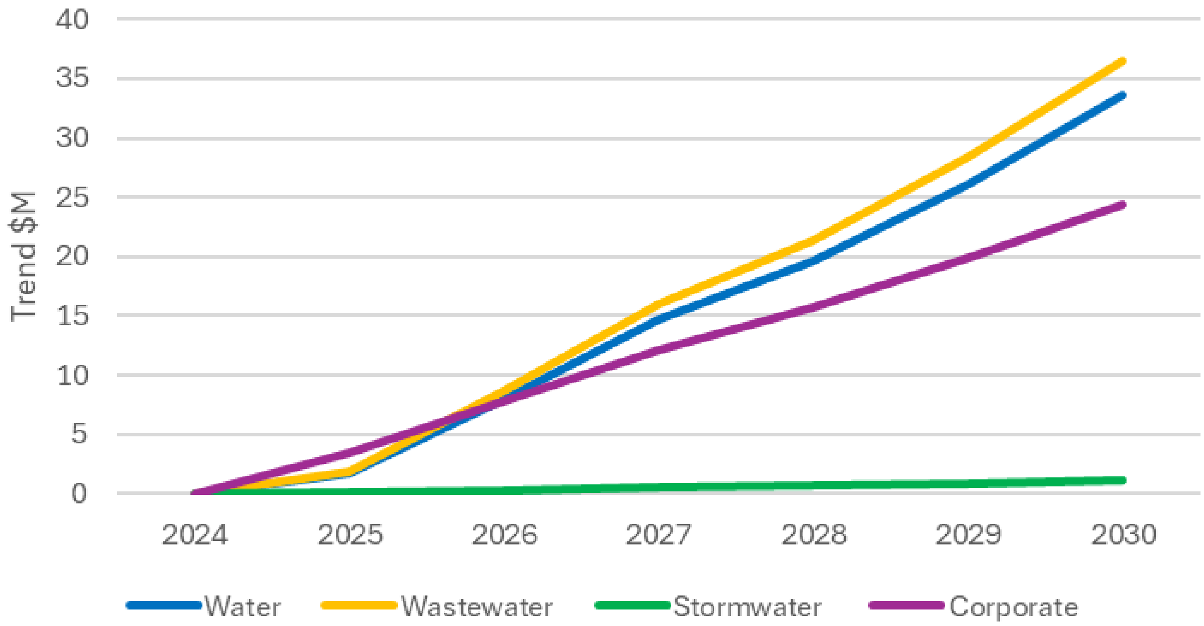
Trend (%)	2025	2026	2027	2028	2029	2030
Efficiency	0.70	0.70	0.70	0.70	0.70	0.70
Growth	1.40	1.40	1.50	1.40	1.30	1.20
RPE services	-0.30	0.70	0.60	0.30	0.80	1.00
RPE corporate	0.80	1.20	1.10	0.80	1.20	1.30

Source: SIR BTS

These percentages are applied to the normalised FY24 controllable expenditures by service to quantify the total expenditure in each service, shown in Figure 3-17. The main drivers of the trend expenditure are those related to growth – electricity, chemicals, customer connections, volume and real price effects. These are offset by efficiencies applied to the base year 2024. For corporate, Sydney Water has just applied the labour Real Price Effect (RPE).

There is an inconsistency in the growth annual percentages in 2029 and 2030 within the SIR. The years from Section 10 of the Sydney Water's submission show 1.1% and 1.0% respectively.

Figure 3-17 - Trend expenditure by service



Source SIR BTS and AtkinsRéalis analysis

We discuss these growth-related factors and derive a view of the impact of growth on each item, then draw a conclusion as to the percentage trend to be applied to each service. The trend values may differ between services because the cost drivers are different. In the water service, total demand is relatively flat hence low marginal costs for chemicals and electricity. In the wastewater service, costs are driven by sewage loading which relates to population.

3.4.3.1 Efficiency

In the 2020 Determination, Sydney Water was set and achieved a continuing efficiency of 0.8% p.a. from 2022. For the future period it has set itself a continuing efficiency challenge of 0.7% p.a. on controllable costs which is slightly lower than recently achieved. Given that Sydney Water is proposing further efficiencies in the Step process, we consider that it is reasonable to accept the 0.7% p.a. applied to the Trend. For the lower case, we propose that the 0.8% p.a. be applied. The efficiency relates to the base year expenditure and is independent of the trend but is a convenient place to apply it in the model.

3.4.3.2 Growth

Property growth forecasts in Section 10 of Sydney Water's submission shows an initial 1.4% per annum increase. The growth forecast and its assumptions have been explained but we have not carried out a detailed review. The trend expenditure has been forecast from the 2024 base using similar percentage as the property growth. While this cost driver can be used as an indicator for growth, we have considered those drivers to trend expenditure such as electricity, chemicals, customer service costs and real price effects offset by efficiency proposals for the base expenditure.

Current period expenditure in Figure 13 of the submission shows a relatively level profile indicating that growth was not a specific driver for opex or was embedded within the total expenditure envelope. We also note the growth factor is applied to total controllable expenditure rather than just those categories most likely to be driven by growth such as chemicals, electricity and customer services. Given the small forecast increases in water demand, this can be influenced by Sydney Water's own activities such as water conservation, customer supply pipe plumbing losses from the digital metering project and leakage reduction, or leakage management (noting as above that leakage is above the economic level).

Growth in water services is measured by the volume supplied. This in turn drives chemical and electricity costs. We note from the discussion on bulk supplies in Section 3.4.2.2 that there is little change in total water requirements, with a minimal increase of 1.8% (0.35%/a) in volume over the period. We note that Sydney Water's assumption for water growth is based on the increase in residential properties. We have considered future estimates of electricity and chemical costs for the water service to test the growth assumption. This is discussed in Sections 3.4.3.3 and 3.4.3.4 below.

The percentage growth in wastewater services is based on the increase in residential and commercial properties. Additional population increases the load on treatment plants. We have considered future estimates of electricity and chemical costs for the wastewater service to test the growth assumption. This is discussed in Sections 3.4.3.3 and 3.4.3.4 below.

For both services we have reviewed the forecast for customer service costs to understand the impact of additional customers and tested this against the overall percentage growth assumptions.

There is a question as to whether to apply this growth rate to those areas of expenditure impacted by growth and not those areas which are independent. While real cost effects for labour may have a wider impact on the business including corporate, we question whether the growth factor should apply to total expenditure. We recommend that growth assumptions applied to the base year should be lower than proposed by Sydney Water. This is because only elements of the base year expenditure are sensitive to growth. In addition, growth expenditure in the current price path was not material. We summarise our findings in Section 3.4.3.7.

3.4.3.3 Electricity

Current period demand and expenditure

Total electricity demand over the current period was 5.3 GWh (0.4%) above the Determination assumption. Expenditure was [redacted] above the Determination due mainly to a change in unit rate for electricity purchases, outages in renewables resulting in further bulk purchases and a small increase in demand. An analysis of electricity demand and expenditure is shown in Table 3-13.

Table 3-13 - Electricity demand and expenditure current period

(FY25) year ending June	2021	2022	2023	2024	Total 2021 to 2024
ELECTRICITY DEMAND - TOTAL (GWh)					
2020 Determination	436.3	435.0	435.9	434.5	1741.7
Actual	439.3	435.9	432.6	439.2	1747.0
Actual > Determination	3.0	0.9	-3.3	4.7	5.3
ELECTRICITY DEMAND - MET BY RENEWABLES (GWh)					
2020 Determination	77.9	84.6	84.6	86.8	333.9
Actual	63.4	49.5	44.8	58.4	216.1
Actual > Determination	-14.5	-35.1	-39.8	-28.4	-117.8
ELECTRICITY DEMAND - MET BY GRID (GWh)					
Grid Purchase Determination	358.4	351.3	348.5	348.7	1406.9
Actual Grid	375.9	386.4	387.8	387.9	1538.0
Variance	17.5	35.1	39.3	39.2	131.1
POWER OPERATING EXPENDITURE ($M)					
2020 Determination	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Actual	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Actual > Determination	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
REASONS FOR VARIANCE ($M)					
Load increase	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Renewals outage	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Rate increase	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Source: RFI113

The analysis shows an even trend in demand over the period. Electricity demand is driven mainly by water volumes which show a marginal increase over the period.

The outage in renewables is attributable to the Prospect Hydro plant and co-generation plants at Prospect hydro, North Head hydro and Malabar co-generation plants. In 2024, there was a shortfall of 3.88 GWh. from the Prospect hydro plant and a 1.57 GWh shortfall for Malabar. These combine to give an effective [redacted] shortfall which is substituted with grid supply.

In 2025, Sydney Water advised that there is a projected 7.3 GWh p.a. increase in demand due to new assets being commissioned at the West Camden wastewater treatment plant and at two water supply pumping stations.

Future period demand and expenditure

Forecasts of electricity demand are based on individual sites for the large users with the top 50 sites utilising 85% of total demand. The remaining 1,500 sites utilise 15% of total demand. The forecasts of demand and expenditure by service are summarised in Table 3-14.

Table 3-14 - Electricity demand and expenditure forecasts

($M FY25) year ending June	2024	2025	2026	2027	2028	2029	2030	Total 2026 to 2030
ELECTRICITY OPERATING EXPENDITURE ($M)								
Other	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Wastewater treatment	[redacted]		[redacted]					
Water treatment	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
Networks	[redacted]		[redacted]					
Total	[redacted]		[redacted]					
ELECTRICITY DEMAND (GWh)								
Total demand	439.20	447.00	454.30	487.90	493.90	507.00	518.50	2461.6
Grid purchase	387.9	384.9	381	414.6	420.6	433.7	445.2	
Self-generation gross	70.7	85.00	83.50	83.50	83.50	83.50	83.50	
Less exported	8.6	22.90	10.20	10.20	10.20	10.20	10.20	
Self-generation net	62.1	62.1	73.3	73.3	73.3	73.3	73.3	
Unit costs ($M/GWh)								
Grid supply	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	

Source: Sydney Water Presentation 4G and AtkinsRéalis analysis

Sydney Water has a detailed approach to power purchasing advised by specialist consultants. Forward purchasing allows it to secure power at competitive rates. A new tariff comes in at the beginning of the future period with a 30% increase in the grid supply tariff from 2024 to 2025 but no significant change through the future period.

The water treatment and networks show a relatively flat demand profile. The main impact is an increase in prices in 2025 which results in a cost increase to 2030 of [redacted] p.a. for water treatment and [redacted] for networks. There is, however, a significant increase in wastewater treatment demand, some 34% above the 2024 level. Sydney Water attributes this increase to an additional process being installed at several wastewater treatment works such as Winmallee, Camelia and Upper Nepean. We have assumed that operating expenditure for these additional processes are beyond 2030.

Grid demand increases by 57.3 GWh (14.8%) from the 2024 base year to 2030 equivalent to 2.5% per annum. There is also an increase in the net self-generation when new plant is to be commissioned.

Overall, electricity expenditure is forecast to increase by [redacted] in FY30 from the 2024 base. The main part of this increased demand is from wastewater treatment. This compares with a relatively level total electricity demand in the current period. While grid demand increased by 9%, there was a similar reduction in renewables output because of plant outages.

The water demand forecast in the Sydney Water submission shows a flat profile, marginally above the FY24 base. This appears to be consistent with the water service forecast electricity demand and with the level electricity demand in the current period. Electricity costs are driven mainly by price increases in 2025. We summarise our findings on trend assumptions in Section 3.4.3.7.

3.4.3.4 Chemicals

Chemical purchases form some 41% of material costs. Material costs form 5% of total operating expenditure. Chemical purchases are controlled and forecast centrally. During the current period, chemical costs increased significantly because of the international disruption to the market with consequential supply chain constraints. For example, the cost of chlorine gas increased by nearly 20% from FY22 to FY24 although is now understood to be stable. In addition, raw water quality deteriorated in FY23 and FY24 because of wet weather resulting in additional chemicals being used. The expenditure profile is shown in Table 3-15, showing a significant cost increase in 2022 when volumes remained relatively constant.

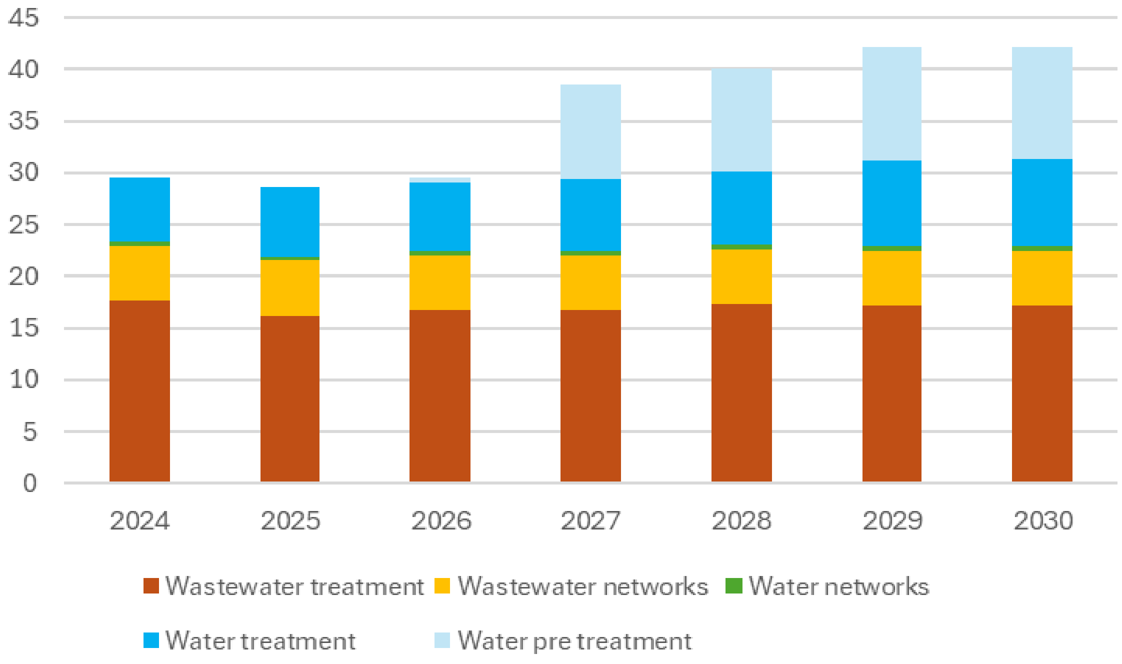
Table 3-15 - Chemical purchases in the current period

Year ending $FY25M	2021	2022	2023	2024	2025
Water treatment	5.41	4.65	6.20	6.18	6.70
Water networks	0.36	0.45	0.43	0.41	0.40
Wastewater networks	4.93	4.42	5.67	5.36	5.30
Wastewater treatment	8.17	13.60	16.04	17.61	16.20
Total	18.87	23.11	28.33	29.56	28.60

Source: Sydney Water Presentation 4H

The largest chemical demand for water treatment is chorine, mainly in gas form, ferric and polymer. These form the greatest cost elements. Wastewater treatment uses significant quantities of sodium hypochlorite and ferrous chloride. Chlorine is obtained from a single source where the contract is due to expire in 2026. There is also a single source supplier for sodium hypochlorite also for renewal in 2026. The ferric supply contract also expires in 2026. The chemical market has stabilised and, from an assessment of relative price effects, is expected to remain stable through the future period.

Figure 3-18 - Forecast chemical expenditure



Source: Sydney Water presentation 4H and AtkinsRéalis analysis

Forecast chemical use by service is shown in Figure 3-18. For water treatment, Sydney Water uses a SWIFT model for forecasting chemical use based on raw water quality assumptions. It has demonstrated how this model seeks to bring efficiencies through optimising dosing rates depending on raw water quality. The increases in chemical costs over the period are marginal except for additional chemical use at the Orchard Hills plant.

For the wastewater service, manual forecasting is applied as chemical use is more difficult to forecast because of the varying quality of sewage effluent. Chemical use over the period is forecast to be unchanged. Chemical use in networks is forecast to be relatively unchanged.

Overall, the forecasts show a 1% per annum increase in chemical costs over the period, excluding the pre-treatment chemical costs which are included in the Step changes. This is driven by the increase in the water service chemicals at an average of 6% per annum over the period.

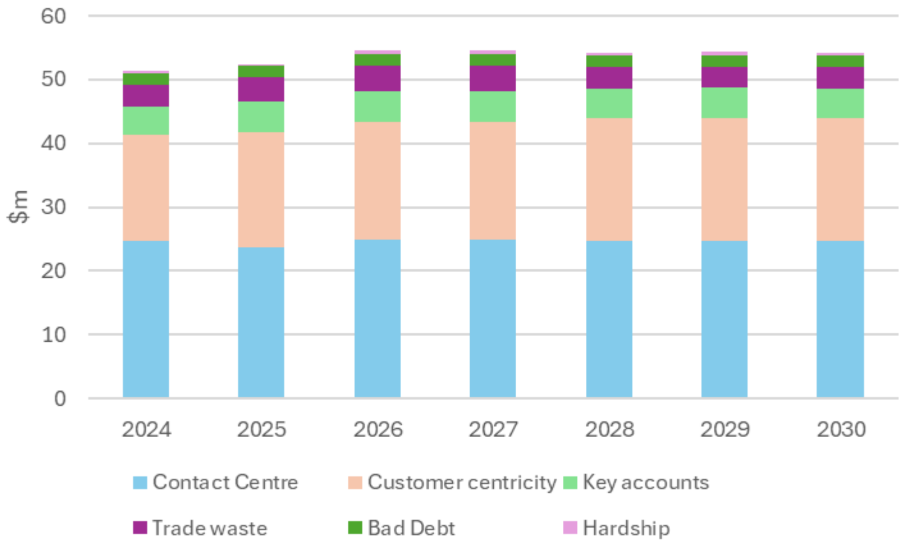
Total bulk water supplies are forecast to be relatively flat from the 2024 base and bulk supplies from WaterNSW are not forecast to increase. Thus, the increased water chemical costs are not driven by increase in volumes.

The costs for pre-treatment chemicals for the new plants at Nepean, Prospect and Orchard Hills form part of a proposed step change and are discussed in Section 3.4.5. The Prospect works is not due for completion before August 2027 which implies operating expenditure starting in FY28, later than implied in the step change. We question whether these pre-treatment chemical costs should be offset by the increased cost of treatment by the BOO contractors during the current period.

3.4.3.5 Customer service

Customer service expenditure shown in Figure 3-19 below shows the trend from the 2024 base. There is an increase in expenditure from $51.3M p.a. in the base year FY24 to $54.2M p.a. in FY30, equivalent to $2.9M or 0.6% p.a.

Figure 3-19 - Customer service expenditure



Source: Presentation 5E

We have excluded the 'read to cash' heading in the analysis as this mainly relates to digital metering which is a Step change.

There is an overall net increase of $2.9M over the period, equivalent to 0.5% p.a. This relates to additional FTEs to manage the customer service function. We questioned, given the reported vacancy rate, whether all these additional FTEs are required.

We noted that the $0.6M p.a. cost increases proposed are significantly lower than the 1.5% p.a. assumed for growth.

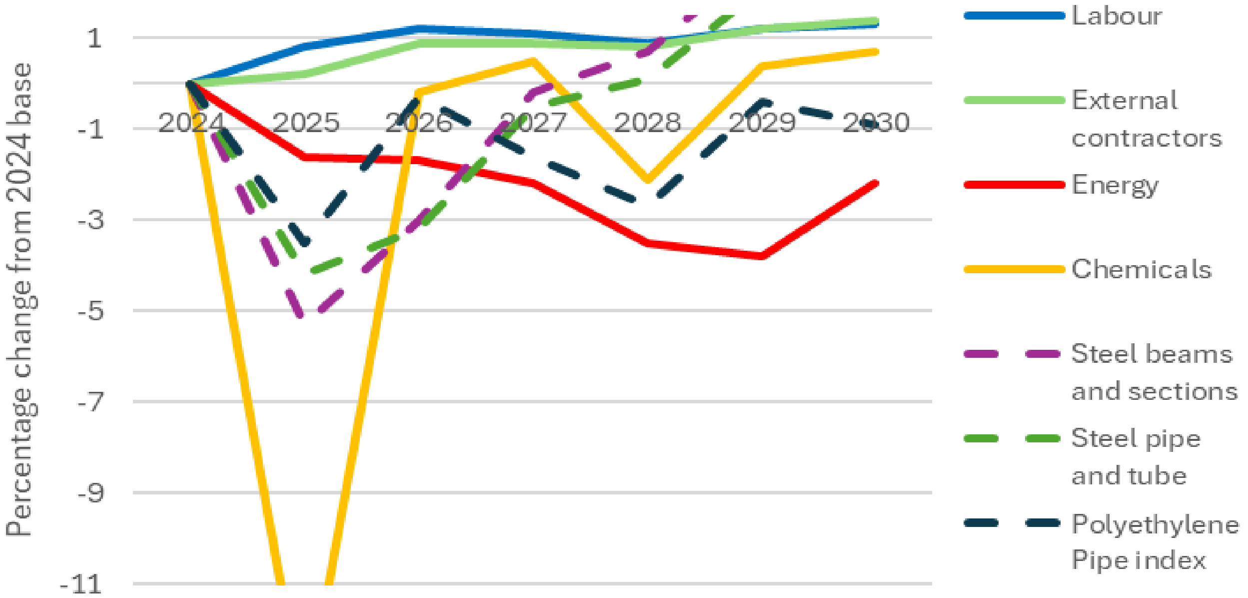
3.4.3.6 Real price effects

Sydney Water has made an assessment of the real price impact of costs in relation to assumed inflation factors applied in the IPART modelling. It employed Oxford Economics to report[15] on the real input price escalation of eight inputs to derive a weighted average to apply to the trend forecast. The main indices with the greatest weightings are labour, external contractors, energy and chemicals. In addition, four material indices are included for steel beams, steel pipe, concrete pipe and polyethylene pipe.

For labour, the Wage Price Index for the EGWWS (Electricity, Gas, Water, and Waste Services) sector in NSW is used as a proxy for all network related labour costs. The results of the analysis are shown in Figure 3-20. A balanced approach has been taken where the analysis includes those indices having both positive and negative values. Only the labour RPE has been applied to corporate expenditure.

[15] Labour and material cost escalation forecast, Oxford Economics, May 2024

Figure 3-20 - Real price indices



Source: Presentation 2i

Sydney Water has little influence on commodity and material indices although could manage labour and contractor indices. The weighted average of these indices is shown in Table 3-16. In a competitive market, a company might seek to reduce the impact of labour costs on its business. We tested the sensitivity of reducing the impact of labour and contractors on the weighted average index. This is shown in the table and can be applied to the lower scenario.

Table 3-16 - Real price indices

% year ending	2024	2025	2026	2027	2028	2029	2030
Sydney Water weighted average	0.0	-0.3	0.7	0.6	0.4	0.8	1.0
Sensitivity - 71% applied	0.0	-0.4	0.4	0.4	0.2	0.5	0.7
Sensitivity - 50% applied	0.0	-0.5	0.2	0.2	0.0	0.3	0.5

Source: Presentation 2i and AtkinsRéalis analysis

In the Trend analysis, these relative price indices are applied to the whole of the controllable base expenditure. An analysis of the 2024 operating expenditure showed that the RPE analysis applied to 71% of the reported costs. It would be logical to apply the same percentage to the normalised base year expenditure.

3.4.3.7 Findings

Sydney Water has proposed a trend expenditure by applying percentage annual additions to the normalised base year expenditure following the IPART methodology in the spreadsheet SIR BTS. It has assumed:

- A growth rate of 1.4% p.a. to 1.2% p.a. based on new connected properties
- An RPE adjustment based on a weighted average of eight input costs
- A continuing efficiency of 0.7% p.a.

The impact of these assumptions is to increase water expenditure by $33.2M p.a. by FY30, the wastewater service by $36.5M p.a. and corporate by $24.3M p.a. We noted that in the current period, expenditure was relatively flat and there was no specific allowance for growth. We also noted that bulk water supply volumes are relatively flat over the period.

We tested the assumptions by looking at water expenditure which is driven by growth – electricity, chemicals and customer services – and also reviewed the RPE methodology. Water electricity costs are forecast to increase by $11.4M p.a. by FY30, chemicals by $1.4M p.a. and customer services (excluding Step expenditure) by $1.5M p.a. We found that the 1.4% p.a. growth assumption significantly exceeds the likely cost increases to support growth through the future period.

The growth expenditure is likely to be half of that derived from residential and commercial properties over the period. For the upper scenario, we have assumed a growth rate of 0.7% p.a. for water and 1.0% for wastewater to reflect the higher cost effects on this service. For the lower scenario, we assume that, as in the current period, growth expenditure is contained within base expenditure. We have proposed the same adjustments to the stormwater service as for water as there is little relation to growth drivers.

The upper scenario for RPE assumes that this factor is applied to 71% of the base year expenditure; that is those elements of the base which have been modelled in the RPE analysis. To simplify the analysis, we have applied the 71% to the labour and contractor components. The lower scenario reflects the action of a company in a restrained market where 50% of the labour adjustments have been applied.

We have assumed the 0.7% efficiency assumption for the upper scenario. For the lower scenario this is increased to 0.8% as set in the 2020 determination.

Sydney Water has applied a growth percentile to corporate expenditure although any activities related to growth are not direct. We accept that the RPE applicable to labour is appropriate and have applied the same adjustments as for the water service.

These percentiles have been applied to the updated SIR BTS spreadsheet to derive annual expenditures. These adjustments are summarised in Table 3-17.

Table 3-17 - Trend percentiles to be applied to the upper and lower scenarios

Trend (%)	2025	2026	2027	2028	2029	2030
Sydney Water proposal						
Efficiency	0.70	0.70	0.70	0.70	0.70	0.70
Growth	1.40	1.40	1.50	1.40	1.30	1.20
RPE	-0.30	0.70	0.60	0.30	0.80	1.00
Upper scenario						
Efficiency	0.70	0.70	0.70	0.70	0.70	0.70
Growth -water service	0.70	0.70	0.70	0.70	0.70	0.70
Growth wastewater	1.00	1.00	1.00	1.00	1.00	1.00
RPE 71%	-0.44	0.40	0.40	0.16	0.50	0.70
Low scenario						
Efficiency	0.80	0.80	0.80	0.80	0.80	0.80
Growth	0.00	0.00	0.00	0.00	0.00	0.00
RPE 50%	-0.53	0.21	0.23	0.01	0.29	0.46

Source: AtkinsRéalis analysis

3.4.4 Step expenditure – Water Service

The Step is defined as any forward-looking step change in the efficient level of recurrent controllable opex due to a particular event, such as changes to regulation or the method of delivering a service. We have interpreted this as an exogenous driver such as meeting any changes from regulators, a change in external factors such as raw water quality or the impact of growth in new development areas. Some drivers included in the proposals such as water and wastewater maintenance are endogenous although they represent changes in workload and not changes in the method of delivering a service.

Sydney Water has proposed a range of step changes as summarised in Table 3-18 below. Proposed step changes are defined by item. We identified changes driven by external requirements (exogenous) and internal business need (endogenous).

We have reviewed each of the material proposed step changes to ensure that the item meets the requirements of a step change, that the timing of the expenditure is appropriate, and the level of expenditure proposed is efficient.

Table 3-18 - Proposed STEP changes water service ($FY25M)

Year ending $FY25M	2025	2026	2027	2028	2029	2030	Total 2026 to 2030
Dam safety	0.1	0.1	3.4	0.0	0.1	3.4	7.0
EPA Regulations	1.5	1.8	1.8	1.7	1.7	1.7	8.8
NSW Water Quality/ testing & monitoring	1.4	1.6	1.6	1.7	1.7	1.7	8.3
Uplift in water maintenance	11.1	13.8	16.6	17.5	17.9	18.3	84.1
Raw water quality pre-treatment	0.0	6.5	13.5	15.6	15.3	14.1	65.1
Digitalisation	2.8	3.5	3.1	3.2	3.6	3.8	17.1
IT project opex	3.3	5.1	2.5	1.6	0.4	2.0	11.6
Digital metering	1.4	3.2	5.0	6.7	8.5	10.3	33.7
SCADA & OPS Control	1.4	1.9	2.4	2.4	2.4	2.4	11.4
Property costs	6.5	7.7	8.2	7.5	7.5	6.7	37.5
Research and innovation	1.1	0.8	1.2	0.7	1.2	0.6	4.4
Adjustment for unregulated costs	-2.0	0.5	-0.4	-0.0	-0.3	-0.3	-0.6
Adjustment for Right of Use (RoU) leases	2.6	2.9	1.7	2.1	1.8	1.7	10.1
Climate risk assessment and management program	0.4	0.8	0.6	0.6	0.6	0.6	3.0
Gross water step expenditure	31.7	50.0	61.1	61.3	62.3	66.9	301.5
Less efficiencies proposed by Sydney Water	-20.3	-20.5	-33.3	-37.7	-41.0	-48.0	-180.4
Net water step expenditure	11.4	29.5	27.8	23.6	21.3	18.9	121.1

Source: SIR bts. Note: numbers may not sum due to rounding.

Digital operating and capital expenditure are reviewed in Section 4.10.5. We have not reviewed positive and negative step expenditure less than $5M over the period as this is not considered a material step in expenditure and could be managed in the base year operating expenditure envelope.

3.4.4.1 Dam safety

Sydney Water provided a detailed explanation for dam safety expenditure in RFI 266:

> *Following the release of the Dams Safety Act 2015 (NSW), the Dams Safety Regulation 2019 (NSW) came into operation in late 2019.1 Throughout the 2020-24 period, we have been working with Dams Safety NSW (DSNSW) to better understand DSNSW's expectations and to ensure our compliance with the requirements of the regulation. This includes: • Ensuring our management systems were compliant with relevant ISO standards and meet DSNSW's expectations,*
>
> *Several stormwater assets still need to be assessed to confirm whether they fall within the scope of the Dams Safety Regulation 2019 (NSW) as a 'declared dam'. As the Regulation commenced after we submitted our June 2019 Price Proposal to IPART for the 2020 Price Review, we did not propose any expenditure for this dam safety work for the 2020-24 period. We absorbed it within the existing operating expenditure budget.*

We note that our proposed expenditure includes an allowance for additional dams being declared due to changes in risk profile and new dams also being built. We are currently finalising a review of our dams and are also in discussions with DSNSW about 4 additional assets that become 'declared dams'.

We confirm that this is a step change driven by exogenous requirements and accept the expenditure proposals.

3.4.4.2 EPA Regulations

The EPA Biosolids Review relates to wastewater treatment sludge. Sydney Water has proposed, in RFI 194, a change to the forecast step expenditure to include all costs in the wastewater service. We have adjusted the wastewater service STEP expenditure, accordingly, as shown in Table 3-28 and Table 3-30.

3.4.4.3 NSW Water quality regulations

Sydney Water has advised, in RFI193, that all proposed expenditure under this heading should be included in the water service. We have adjusted the water and wastewater service proposed expenditures. The total step expenditure is therefore an average $3.4M p.a. over the period. There is a difference in costs presented in the SIR BTS spreadsheet and the RFI191. We have used the SIR expenditure in our analysis.

Only part of this expenditure, an average $0.7M p.a., relates to meeting the new and changing sampling and testing requirements set out by the Australian Drinking Water Guidelines (ADWG) which were recently revised to address recent community concerns over PFAS chemicals. Sydney Water expects the final revised ADWG to be published by the NHMRC in 2025. It also includes additional recycled water quality sampling and testing activities, which will take place at the new water recycling plants at Upper South Creek and Quakers Hill.

[redacted]

[redacted]

We assume that the proposals should bring significant efficiencies although not stated. Efficiencies may be covered under the high level efficiency proposals but it would be helpful to understand how these apply to the enhanced laboratory services. [redacted] These proposals have yet to progress through a business plan and scrutiny by the business.

[redacted] We have accepted the expenditures reported in the SIR BTS submission to reflect the upper and lower scenarios. The expenditure reported in RFI193 is higher but has yet to progress through the business planning process.

Table 3-19 - Step change due to water quality regulations

Year ending $M 25	2025	2026	2027	2028	2029	2030	Total 2026 to 2030
Water service step	1.4	1.6	1.6	1.7	1.7	1.7	8.3
Wastewater services step	1.1	1.2	1.3	1.1	0.9	0.9	5.4
Total Step included in Water	2.6	2.8	2.9	2.8	2.6	2.6	13.7
Source: SIR BTS worksheets used as upper and lower scenarios							
Water quality and testing - new/ changing regs	0.5	0.6	0.7	0.7	0.7	0.7	3.5
Modernisation of labs	2.1	2.2	2.2	2.1	1.9	1.9	10.2
Total Step included in Water	2.6	2.8	2.9	2.8	2.6	2.6	13.7

Source SIR BTS, RFI193 and AtkinsRéalis analysis,

We questioned to what extent non-regulatory services are excluded from the price proposals. Sydney Water stated that:

> *Regulatory opex associated with our laboratory services has been included in our total regulatory opex submitted in our Price Proposal. This includes $27 million in our baseline expenditure for 2023-24. Non-regulatory opex associated with our laboratory services has not been included in our total regulatory opex submitted in our Price Proposal. It consists of: • Incremental Opex: These are costs to deliver the non-regulated services and is primarily made up of labour costs, materials and some other minor costs required to deliver the scope of services. • Overhead allocation: A local overhead is applied for support cost for non-bench work. These are an allocation of pooled costs, such as business unit overheads, and common local overheads. We also apply a corporate overhead, which is an allocation of other common costs such as digital, risk and assurance and people & governance costs.*

We have confirmed that cost of non-regulatory services has been excluded, and that reasonable overhead has been applied. The non-regulatory service comprises about 4% of total operating expenditure. If further expenditure is proposed for the laboratory lease, then it would be reasonable to apply some of this cost to non-regulatory services.

3.4.4.4 Uplift in water network maintenance requirements

Sydney Water has proposed a step increase in maintenance expenditure for the water networks as shown in Table 3-20.

Table 3-20 - Step change in network expenditure from the 2024 base year

Year ending $FY25M	2025	2026	2027	2028	2029	2030	Total 2026 to 2030
Uplift in water maintenance	11.1	13.8	16.6	17.5	17.9	18.3	84.1

Source: SIR BTS worksheet

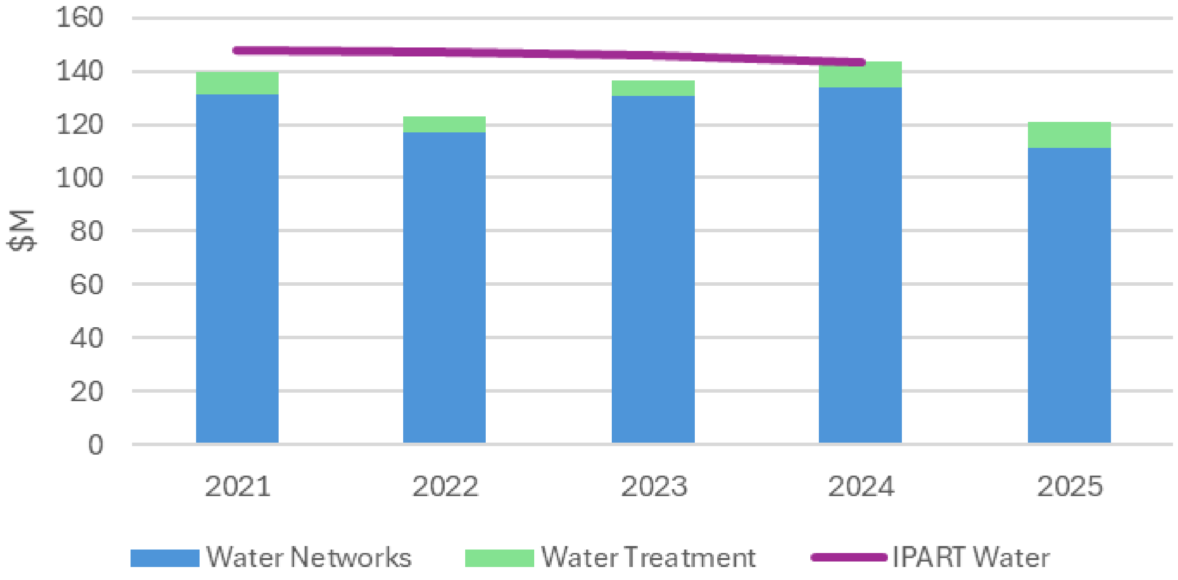
Maintenance expenditure comprises water treatment and distribution. Water distribution comprises trunk and distribution mains, pumping stations and service reservoirs. We firstly look at historical expenditure and performance to inform our view of an efficient range of future expenditure.

Current Period expenditure and performance

We have reviewed the overall profile of maintenance expenditure in the current period summarised in Figure 3-21 below. This graph includes water maintenance expenditure and compares actual expenditure against the IPART determination. Over the current period, expenditure was 7% below the determination with lower expenditure in 2022 and 2023 following the period of Covid restrictions. Year 2025 expenditure, while not part of the determination, forecasts a lower level than 2024.

Over the current period, water treatment, for those assets owned and operated by Sydney Water, expenditure was relatively small in relation to networks but showed a significant increase from $8M in FY21 to $10M in FY25. Conversely, water network expenditure with an average expenditure of $125M reducing to $110M in FY25.

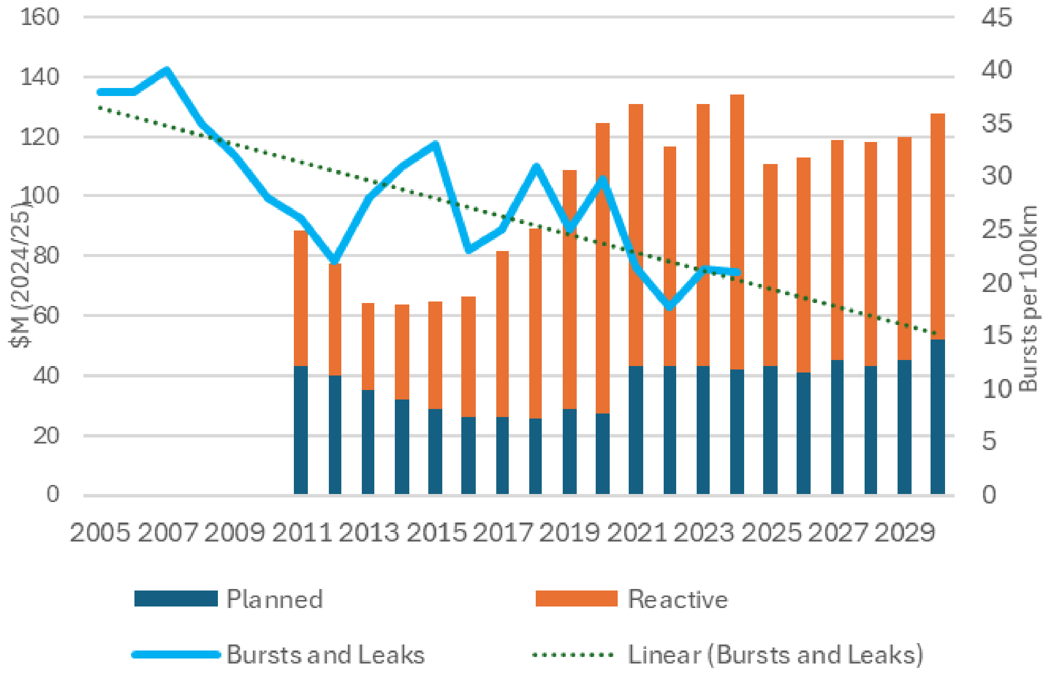
Figure 3-21 - Water maintenance expenditure over the current period ($M 25)



Source: Presentation 4Q, Sydney Water and AtkinsRéalis analysis

A key output for the water service is maintaining the water continuity performance measure through reducing the number and impact of mains leaks and bursts. There is a long-term trend in reducing bursts and leaks over the period from 2005 to 2024. This is shown in Figure 3-22. The figure also shows network expenditure for planned and reactive maintenance from 2011, all at the 2025 price base.

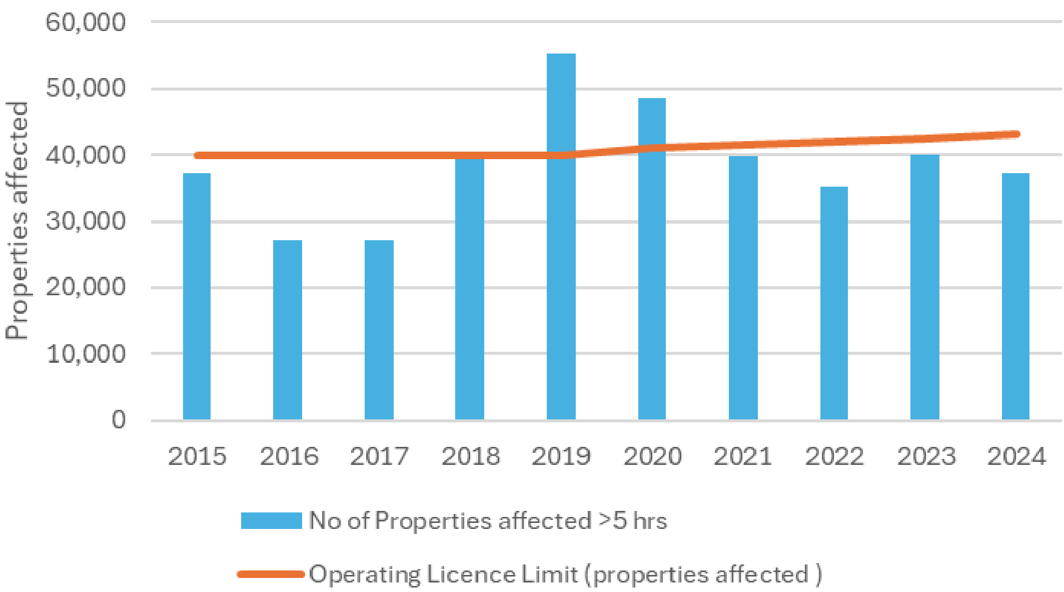
Figure 3-22 - Long term trend in bursts and leaks compared with maintenance expenditure



Source: Sydney Water RFI2 and AtkinsRéalis data

Sydney Water advised that the lower number of burst and mains leaks in recent years is due to the wetter than average weather. Performance against the continuity measure in Figure 3-23 shows some exceedance above the measure in 2019 and 2020, when bursts and mains leaks showed small peaks in Figure 3-22 above. In the period from 2021, the relatively high property numbers relate to a small number of bursts mainly on trunk mains impacting on a significant number of properties. The continuity standard was achieved although with little headroom. This performance measure was discussed in Section 3.3.2.

Figure 3-23 - Performance against the water continuity standard

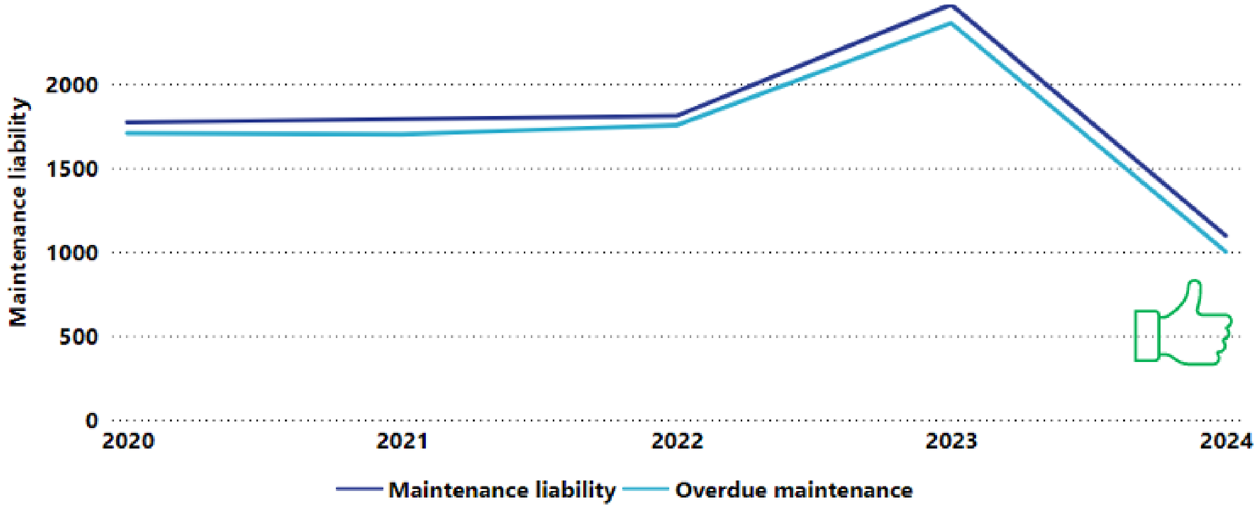


Source: Sydney Water RFI199.1.

Water treatment maintenance has increased over the current period although forms only a small proportion of water expenditure. Sydney Water attributes this to an increase in work orders over the period. Figure 3-24 below shows the maintenance activity over the current period showing a peak in 2023 reducing in 2024. While this data is influenced by capital renewals, it shows an improving state of asset performance with the number of work orders peaking in 2023 then reducing in 2024 and backlog being addressed. We noted a significant increase in water treatment maintenance expenditure in 2024.

We note that all the treatment works comply with the Australian drinking water quality guidance although impacted by deteriorating raw water quality, as discussed in Section 3.4.2.3. The one exception was a THM failure at the Orchard Hills plant.

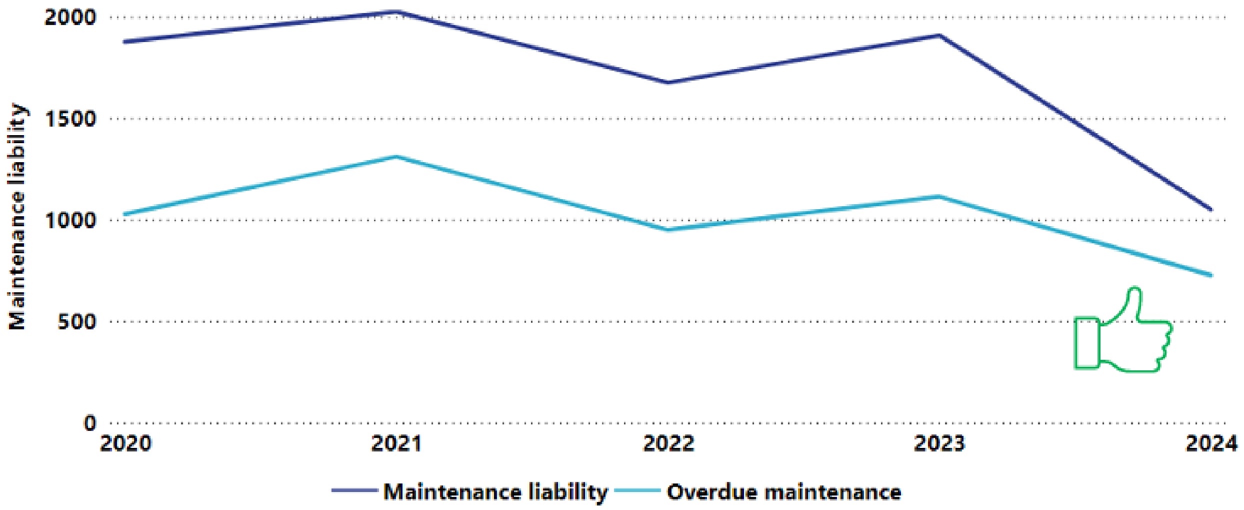
Figure 3-24 - Water treatment plants maintenance liability and overdue maintenance



Source: Presentation 4Q.
Note: The thumbs up symbol represents improving or stable performance and relates to Sydney Water's commentary.

Water network expenditure on facilities such as pumping stations, service reservoirs and associated assets shows a reducing trend in maintenance (work order) activity; the backlog is reducing shown as the number of job numbers in Figure 3-25 below. This is as a result of both maintenance and asset renewal.

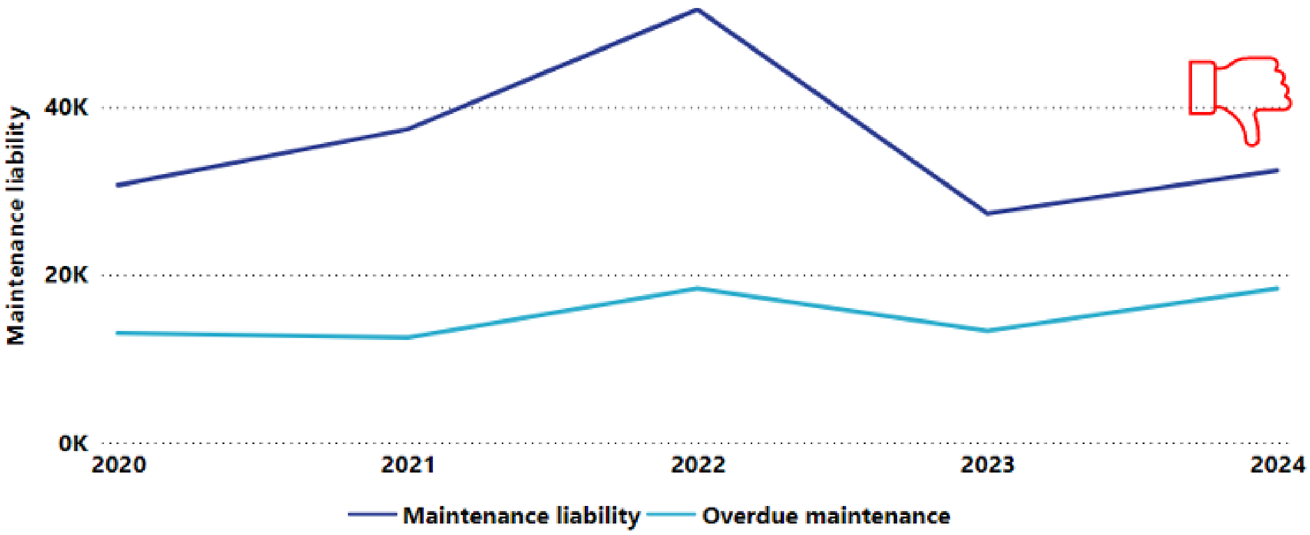
Figure 3-25 - Water network facility assets maintenance liability & overdue maintenance



Source: Presentation 4Q.
Note: The thumbs up symbol represents improving or stable performance and relates to Sydney Water's commentary.

Water network expenditure on trunk and distribution mains shows a peak in maintenance in 2022 reducing in 2022 although showing an increase to 2023. While this shows an increase in maintenance and backlog to 2024, the long term trend is relatively flat. With the implementation of the new ‘Flow’ mains repair function, we would expect to see the backlog being addressed swiftly. This is an example of where improved planning and scheduling can improve response to asset failures in a more efficient and timely way.

Figure 3-26 - Water network trunk and distribution mains



Source: Presentation 4Q.
Note: The thumbs down symbol represents declining performance and relates to Sydney Water’s commentary.

Summary – current period

Expenditure in the current period was marginally below that set in the 2020 Determination but higher than that set in the previous period. The continuity measure has been achieved although the headroom is limited and there needs to be a focus on capital maintenance of high-risk mains and networks. The best practice elsewhere is to manage interruptions through valving, re-zoning and by-passing bursts through overland pipework. These methods could be applied to reduce the impact to customers.

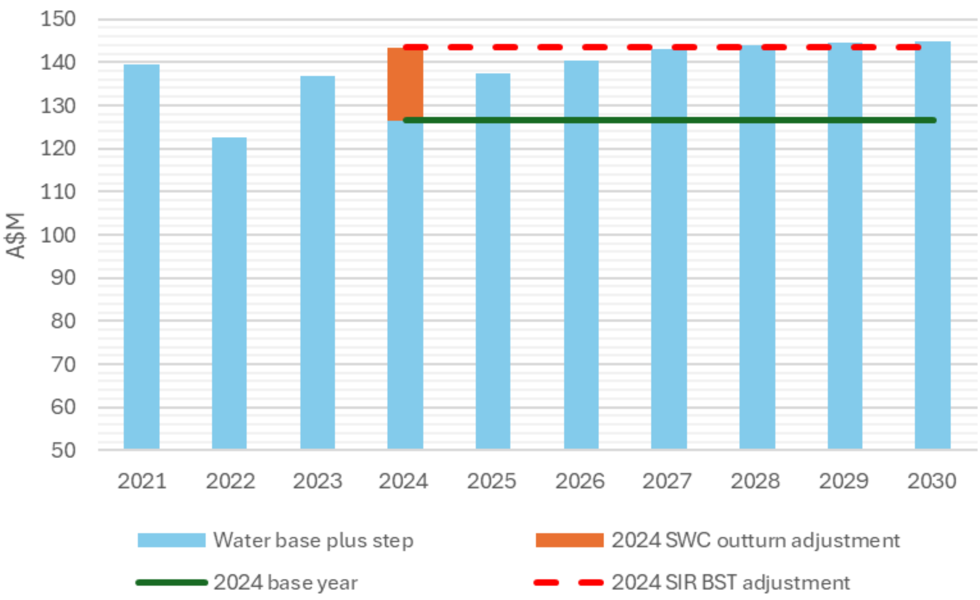
Performance data shows that the pipe network and treatment assets are stable albeit there needs to be a focus on critical mains to reduce the risk of failing the continuity measure.

Step increase in water maintenance expenditure

Sydney Water’s proposed step increase is shown in Figure 3-27. This shows the profile of expenditure from 2021 The step change increase in costs is sensitive to the assumptions made for the base year. Sydney Water has applied a base year 2024 reduction of $17M to reflect the adjustments shown in SIR BTS submission plus a further FY24 year end adjustment which is not included in the BTS spreadsheet reduction. This may have arisen because an adjustment was made post submission of the BTS spreadsheet. For consistency, both step and base year adjustments should be made using the same data.

Figure 3-27 below shows the forecast expenditure based on Sydney Water’s base year adjustment of -$17M using a green line. For comparison, the base year adjustment from the BTS spreadsheet is -$4.6M and shows in a red broken line. We compared this analysis with the average expenditure from 2021 to 2025 with the proposals. The average expenditure in the current period was $133M p.a. compared with an average $143M p.a. for the future period.

Figure 3-27 - Water network trunk and distribution main expenditure



Source: RFI253 and AtkinsRéalis analysis

For the purposes of this review, we have assumed the Sydney Water adjustments although our analysis shows that the step change is less than proposed. The step adjustment proposed by Sydney Water are shown in Table 3-21 below. This comprises expenditure forecasts for detailed maintenance activities over the period.

Table 3-21 - Step expenditure adjustments from base year as proposed by Sydney Water

$FY25M	2024	2025	2026	2027	2028	2029	2030	Total 2026-30
Reactive maintenance	58.1	1.9	4.4	4.6	5.0	4.9	5.0	23.9
Corrective maintenance	18.3	0.3	1.0	1.2	0.9	1.0	1.1	5.2
Reservoir dosing	5.4	-1.2	-1.6	-1.6	-1.5	-1.5	-1.5	-7.7
Painting	1.1	2.2	2.2	2.2	2.3	2.3	2.4	11.4
Facilities	19.8	6.2	6.7	7.1	7.3	7.9	8.3	37.3
Filtration plants	9.2	1.6	1.1	3.1	3.5	3.3	3.0	14.0
Rest of maintenance	31.6							
Total FY 2024	143.5							
Total Sydney Water Step changes		11.0	13.8	16.6	17.5	17.9	18.3	84.1
Efficiency		-14.7	-15.1	-13.9	-13.8	-13.6	-13.4	-69.8
Net increase proposed		-3.7	-1.3	2.7	3.7	4.3	4.9	14.3

Source: Presentation 6B. Note: numbers may not sum due to rounding

We comment on specific maintenance activities.

Reactive maintenance: this is the largest expenditure where an average increase of $4.8M p.a. above the 2024 adjusted base is proposed. The long-term trend in mains breaks and leaks shown in Figure 3-22 indicates a reducing trend over the period from 38/100km in 2005 to 21/100 km in 2024 through two periods of drought in the early 2000s and 2017/2019. While there may be variations in bursts and leaks in coming years, this trend suggests that the level of reactive maintenance is adequate through the future period.

Sydney Water explained that the base year was relatively wet resulting in benign ground conditions. During dry weather, Sydney Water explained that due to ground movement there is a greater risk of an increase in mains bursts. It anticipates that climate forecasts indicate future dry years which gives rise to greater ground movement and hence an increase in bursts and leaks. However, forecast expenditure should be based on average weather conditions. Sydney Water should not expect that customers should bear the risk of the impact of dry weather.

We concluded that the upper scenario of expenditure should be unchanged from the current period. The lower scenario assumes no step increase. Sydney Water has proposed efficiency savings including the recently implemented 'Flow' processes to the maintenance activities.

Planned maintenance: planned maintenance is not reported as a step so we assume that expenditure follows a flat profile from 2024. Corrective maintenance shows a marginal increase of $1.0M p.a. We recommend this is applied to the upper scenario but removed from the lower expenditure scenario.

Facilities: this includes pumping stations**,** service reservoirs and associated assets with an increase of $7.5M p.a. over the future period from the 2024 adjusted base. This is equivalent to a 38% increase on the 2024 expenditure. Asset performance in the current period was showing a stable trend.

In the current period, Sydney Water completed 2197 reservoir inspections and 33 Level 2 condition assessments. Works including repairs, painting, cleaning and recoating were carried out at 160 reservoirs. Pumping station inspections were carried out. It stated that there was more work to do in addressing pumping station and reservoir assets through both maintenance and asset renewal.

We recognise that these assets form important components for the network and the performance is usually measured on work orders. Some of these assets may have had a low priority in the past. We concluded that the proposals have been prepared prior to a formal internal review and business case and there is scope to refine and prioritise maintenance work. We support an increase of $3.8M p.a., some half of the proposal, for the upper scenario. The lower scenario for expenditure would be to manage this work under the existing expenditure envelope.

Painting: this is required for steel reservoirs, overground pipelines and pumping stations to address asset deterioration. There are 180 steel reservoirs. A proposed increase of $2.2M p.a. over the period which is above the $1.1M in 2024. It is proposed to paint four reservoirs per year, compared with about 1.5 in the current period.

We found that this is probably a neglected area of assets to be maintained and the proposal for four reservoirs per year is modest. We conclude that this should be included in the upper scenario. The lower scenario for expenditure would be to manage this work under the existing expenditure envelope.

Manual chlorine dosing: we note that savings are proposed through the discontinuation of manual dosing which is welcomed as manual dosing is inefficient and poor practice. However, this still leaves about $4M p.a. continuing expenditure on this activity. We suggest that this practice should be phased out as being inefficient and poor practice. Capital solutions should be resourced.

Filtration plants: expenditure relates to the plants owned and operated by Sydney Water at Orchard Hills, Nepean, Cascade, North Richmond and Warragamba. Actual 2024 expenditure was $9.2M with a forecast increase of $1.1M p.a. over the future period. The treatment plants benefitted from an increase in maintenance over the current period, from $8.1M in 2021 to $9.9M forecast for 2025.

We found from the current period that treatment works assets are in stable condition following a significant increase in expenditure in 2024. We have not seen convincing information to suggest that there would be deterioration if the current maintenance program continues. We propose that the upper scenario should continue with half the proposed average expenditure of $1.05M p.a. over the period. The lower scenario should assume no increase from the 2024 base.

Sydney Water has included $1.6M p.a. from 2027 for maintenance of the four new pre-treatment facilities at Prospect, Nepean, Orchard Hills and Cascade comprising $1.6M p.a. from 2027. We have reviewed this project in Section 3.4.5.6. We noted that the works would not be complete until Q3 2027, so expenditure is unlikely before this date. We would also expect the contractor to be operating the plant during a proving period. We have therefore assumed that additional maintenance expenditure is likely to be incurred from 2028 and phased over the last three years of the period.

The efficient expenditure in the upper scenario is shown in Table 3-22. Cells are shown in green where adjustments have been made. The step efficiency adjustment has been pro-rated to the total step changes proposed.

Table 3-22 - Efficient expenditure – Upper Scenario

$FY25M	2024	2025	2026	2027	2028	2029	2030	Total 2026-30
Reactive maintenance	58.1	1.9	0.0	0.0	0.0	0.0	0.0	0.0
Corrective maintenance	18.3	0.3	1.0	1.2	0.9	1.0	1.1	5.2
Reservoir dosing	5.4	-1.2	-1.6	-2.0	-3.0	-4.0	-4.0	-14.6
Painting	1.1	2.2	2.2	2.2	2.3	2.3	2.4	11.4
Facilities	19.8	6.2	3.8	3.8	3.8	3.8	3.8	19.0
Filtration plants	9.2	1.6	1.1	1.1	1.6	2.1	2.1	7.8
Rest of maintenance	31.6							
Total FY 2024	143.5							
Total AtkinsRéalis Water Step changes		11.0	6.5	6.3	5.6	5.2	5.4	28.8
Efficiency		-14.7	-7.1	-5.2	-4.3	-3.9	-3.9	-24.5
Recommended expenditure		-3.7	-0.6	1.0	1.2	1.2	1.4	4.3

Source: AtkinsRéalis analysis. Note: numbers may not sum due to rounding

The efficient expenditure in the lower scenario is shown in Table 3-23. Cells are shown in red where adjustments have been made. No efficiency adjustment has been made as totals are negative.

Table 3-23 - Efficient expenditure – Lower Scenario

$FY25M	2024	2025	2026	2027	2028	2029	2030	Total 2026-30
Reactive maintenance	58.1	1.9	0.0	0.0	0.0	0.0	0.0	0.0

$FY25M	2024	2025	2026	2027	2028	2029	2030	Total 2026-30
Corrective maintenance	18.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Reservoir dosing	5.4	-1.2	-1.6	-2.0	-3.0	-4.0	-4.0	-14.6
Painting	1.1	2.2	0.0	0.0	0.0	0.0	0.0	0.0
Facilities	19.8	6.2	0.0	0.0	0.0	0.0	0.0	0.0
Filtration plants	9.2	1.6	0.0	0.0	0.5	1.0	1.0	2.5
Rest of maintenance	31.6							
Total FY 2024	143.5							
Total SWC Step changes		11.0	-1.6	-2.0	-2.5	-3.0	-3.0	-12.1
Efficiency		-14.7	-0.0	0.0	0.0	0.0	0.0	0.0
Net increase proposed		**-3.7**	**-1.6**	**-2.0**	**-2.5**	**-3.0**	**-3.0**	**-12.1**

Source: AtkinsRéalis analysis, numbers may not sum due to rounding

3.4.4.5 New pre-treatment facilities

Sydney Water has experienced high colour and turbidity in the raw water supplied to the Prospect, Nepean, Cascade and Orchard Hills treatment works due to the nature of the catchment and quality of the impounded water. Up to now, additional chemical dosing at each works inlets has been carried out. The plants are all direct filtration with no clarification process upstream. This direct loading onto the filters results in a reduction of throughput and increased frequency of backwashing. This is to meet the turbidity standard at each filter outlet. Sydney Water consider this to be a risk to meeting drinking water quality guidelines and permanent pre-treatment processes are being constructed prior to plant filter inlet.

The largest pre-treatment works is at Prospect where 500 Ml/d or half the throughput will be treated. We report on the capital elements of the project in Section 4.6.3.2. The step change in operating expenditure submitted by Sydney Water is shown in Table 3-24. We focus on the Prospect works as this has the greatest impact on operating expenditure.

The Prospect plant is designed to treat raw water with an average total colour of up to 80 and a peak of 103 Hazen; turbidity is up to 35 and peak (one day) of 268 NTU respectively. The pre-treatment process is designed to achieve a clarified water >10 Hazen with 95percentile <20; turbidity would be <2 NTU and 95percentile <20. This should enable the Prospect filtration plant to operate within its lowest treatment band except for possible spikes in quality.

Table 3-24 - New pre-treatment operating expenditure

Year ending $M 2025	2025	2026	2027	2028	2029	2030	Total 2026 to 2030
Warragamba	0.0	0.1	0.1	0.1	0.1	0.1	0.4
Orchard Hills				0.5	1.2	1.3	3.0
Nepean		0.4	0.4	0.4	0.4	0.5	2.2
Cascade			0.2	0.4	0.4	0.4	1.4
Prospect		6.0	12.8	14.2	13.2	11.9	58.1
Sydney Water total	0.0	6.5	13.5	15.6	15.3	14.1	65.1

Source: RFI207, numbers may not sum due to rounding

These costs meet the Step definition as the deteriorating water quality is an exogenous driver.

Sydney Water has prepared an operating expenditure estimate which includes for operating staff, chemical and power use and sludge disposal. Operating and maintenance costs are based on a percentage of capital costs and are covered in treatment works maintenance in Section 3.4.4.4 above. We have reviewed the Prospect plant costs as this represents 89% of the total step expenditure.

Table 3-25 - Prospect pre-treatment operating expenditure

Year ending $FY25M	2025	2026	2027	2028	2029	2030	Total 2026 to 2030
Labour		0.5	0.5	0.5	0.5	0.5	2.6
Operational services		0.7	2.0	2.7	2.0	0.7	8.0
Chemicals		3.8	8.9	9.5	9.0	9.0	40.1
Biosolids		0.2	0.3	0.3	0.3	0.3	1.6
Energy		0.9	1.1	1.1	1.3	1.4	5.7
Total		6.0	12.8	14.2	13.2	11.9	58.1

Source: RFI 207, numbers may not sum due to rounding

We comment on the assumptions used in deriving future costs. We understand that these were based on the Orchard Hills plant and forecast for the other plants.

Commencement date: the Prospect works is forecast for completion in Q3 of 2027. We question the inclusion of operating expenditure in 2026 and 2027 when the works is under construction. We also assume that the contractor will be operating the works during a testing and handover period when any costs are likely to be capitalised.

[redacted]

Chemical costs: the forecast of chemical use is based on 25 days in a year at maximum colour level and 345 days at median level. [redacted] Using these costs, we estimate the annual chemical costs to be $6.2M p.a., lower than the forecast costs. We consider there is scope for significant efficiencies when the process is subject to optimisation and application of the SWIFT model, used for other treatment processes. We recommend that efficiencies are included in the Step proposals.

Labour: additional **three** operations staff. We assume the plant will be fully automated and monitored centrally so there will be minimal manual intervention.

Maintenance: A forecast cost of $1.6M p.a. for the Prospect Plant has been included in the maintenance water filtration plant step expenditure. We understand these costs are included in treatment works maintenance in Section 3.4.4.4 above.

Energy: we note that unit costs are similar to the total energy forecasts.

Biosolids: costs are based on current contract costs.

Savings from BOO costs: there will be savings in BOO costs from the commissioning of the pre-treatment works. Sydney Water state that the total cost difference is $201/Ml from the BOO plant to $193/Ml using the new pre-treatment plant. This gives a saving of $1.46M. This is not included in the step expenditure. However, this appears to be inconsistent with the $71.2/Ml for the new plant in the calculation above.

We looked at the current operation of the Prospect plant, how it was operating with the high colour and turbidity levels in Figure 3-13. This figure, from Presentation 3D shows monthly average treatment cost ($/Ml) related to actual colour and turbidity values for the period 2021 to 2024. Under the BOO contract, we understand that the cost of treatment relates to colour and turbidity levels:

- Marginal base cost $23/ Ml when colour is <7.7 and turbidity <1.5;
- Marginal treatment cost $54/ Ml when colour is >7.7 and<25.2 and turbidity >1,5 and <6.8;
- Marginal treatment cost $72/ Ml when colour is >25.2and<41.3 and turbidity >6.8 and <10.0;
- Marginal treatment cost $95/ Ml when colour is >41.3 and<47.6 and turbidity >10 and <11.3.

From Figure 3-13, years 2021 and 2022, the Prospect works was operating with colour and turbidity, mainly within the range of normal raw water quality. Raw water quality deteriorated in 2023 when the marginal cost of treating the higher coloured water was some $5.2M p.a. This cost increase is not visible on the BOO costs for 2024 but a significant increase of $12M p.a. is shown for 2025 and continues at that level over the period to 2030. There are no BOO operating savings shown in the period 2028 to 2030.

We formed the view that the full savings from the BOO plant costs from commissioning of the pre-treatment works are not addressed. We assume that savings of $6M p.a. for the upper case. The review of the capex project found that justification for the works was not fully made and excluded it from the lower scenario forecasts. We have therefore excluded additional operating costs from the lower scenario.

Table 3-26 - Efficient upper and lower scenario expenditures

Year ending $M 2025	2025	2026	2027	2028	2029	2030	Total 2026 to 2030
Warragamba	0.0	0.1	0.1	0.1	0.1	0.1	0.4
Orchard Hills				0.5	1.2	1.3	3.0
Nepean		0.4	0.4	0.4	0.4	0.5	2.2
Cascade			0.2	0.4	0.4	0.2	1.4
Prospect		6.0	12.8	14.2	13.2	11.9	58.1
Sydney Water total	0.0	6.5	13.5	15.6	15.3	14.1	65.1
Upper scenario							
Adjust for Prospect timing		-6.0	-12.8				-18.9
Adjust for BOO savings				-6.0	-6.0	-6.0	-18.0
Adjust for chemical costs				-3.0	0.0	-2.5	-5.5
Upper scenario total	**0.0**	**0.5**	**0.7**	**6.6**	**9.3**	**5.6**	**22.8**
Low scenario							
Adjust for Prospect timing		-6.0	-12.8				-18.9
Adjust for BOO savings				-14.2	-13.2	-11.9	-39.2
Adjust for chemical costs	included						0.000
Lower scenario total	**0.0**	**0.5**	**0.7**	**1.4**	**2.2**	**2.2**	**7.0**

Source: AtkinsRéalis analysis. Note: numbers may not sum due to rounding

3.4.4.6 Digital metering expenditure

Sydney Water has commenced a capital project to install smart meters at domestic and commercial customers to replace the manually read meters. This capital project is discussed in Section 4.6.3. The step increase in operating expenditure is offset by efficiencies proposed, as shown in Table 3-27.

Table 3-27 - Step expenditure and efficiencies for digital meters

$M 25 year ending	2025	2026	2027	2028	2029	2030	Total 2026 to 2030
Digital metering opex	1.4	3.2	5.0	6.7	8.5	10.3	33.7
SWC proposed efficiencies (Presentation 5h)							
Proposed efficiency savings		0.8	1.3	1.8	2.2	2.7	8.8
SWC proposed efficiencies (RFI162) from reduction in activities							
Meter reading activities	0.0	0.8	1.5	2.0	2.5	3.0	9.8
Reading new properties	0.0	0.3	0.5	0.8	1.0	1.2	3.8
Total efficiency from RFI162	0.0	1.1	2.0	2.8	3.5	4.2	13.6
AtkinsRéalis upper scenario	**1.4**	**2.1**	**3.0**	**3.9**	**5.0**	**6.1**	**20.1**
Increased benefits meter reading		0.2	0.3	0.5	0.6	0.7	2.2
AtkinsRéalis lower scenario	**1.4**	**1.9**	**2.6**	**3.5**	**4.5**	**5.4**	**17.9**

Source: SIR bts and Presentation 5F, RFI162, AtkinsRéalis analysis. Note: numbers may not sum due to rounding

The proposed efficiency savings were provided at Presentation 5F. However, when we reviewed the capital project the benefits of the digital metering program were set out in RFI 162. This RFI reports the benefits of the program which includes reducing the range of the meter reading contract ($9.8M). reducing the need to read new property meters ($3.8M) and rapid identification and rectification of failed meter (not quantified). The savings amount to $13.6M over the period to 2030. We have used this value as efficiency savings for the upper scenario. We found that the operating expenditure benefits from the capital works are likely to be understated. For the lower scenario we have assumed a further 25% savings from the meter reading activities.

3.4.4.7 SCADA and Ops controls

This is discussed in the Corporate Section in 3.4.7.4.

3.4.4.8 Property costs

Property opex is covered in Section 4.7.1.

3.4.4.9 AtkinsRéalis adjusted step expenditure

The net water expenditure as recommended by AtkinsRéalis is summarised in Table 3-28 for the upper scenario and Table 3-29 for the lower scenario. Digitisation, IT project opex and Property are addressed in Section 3.4.7 Corporate.

We have included adjustments for Water Efficiency activities which we discussed in Section 3.4.2.4.

Table 3-28 - Recommended Water Step expenditure: upper scenario

Year ending $M 2025	2025	2026	2027	2028	2029	2030	Total 2026 to 2030
Dam safety	0.1	0.1	3.4	0.0	0.1	3.4	7.0
EPA Regulations	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NSW Water Quality/ testing& monitoring	2.6	2.8	2.9	2.8	2.6	2.6	13.7
Uplift in water maintenance	11.0	6.5	6.3	5.6	5.2	5.4	28.8
Raw water quality pre-treatment	0.0	0.5	0.7	6.6	9.3	5.6	22.7
Digitisation (in Corporate)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IT Project opex (in Corporate)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Digital metering	1.4	2.1	3.0	3.9	5.0	6.1	20.1
SCADA & OPS Control	1.4	1.9	2.4	2.4	2.4	2.4	11.4
Property costs	0.0	6.4	6.8	6.3	6.2	5.6	31.3
Research and innovation	1.1	0.8	1.2	0.7	1.2	0.6	4.4
Adjustment for unregulated costs	-2.0	0.5	-0.4	-0.0	-0.3	-0.3	-0.6
Adjustment for Right of Use (RoU) leases	2.6	2.9	1.7	2.1	1.8	1.7	10.1
Climate risk assessment and management program	0.4	0.8	0.6	0.6	0.6	0.6	3.0
Gross water step expenditure	18.6	25.2	28.3	30.8	34.0	33.6	151.9
Less efficiencies proposed by SWC	-11.9	-10.3	-15.4	-19.0	-22.4	-24.1	-91.2
Net water step expenditure	6.7	14.9	12.9	11.9	11.6	9.5	60.7

Source: AtkinsRéalis analysis. Note: efficiencies assumed to be pro-rata the gross step efficiency. Nmbers may not sum due to rounding.

Table 3-29 - Recommended Water Step expenditure: lower scenario

Year ending $M 2025	2025	2026	2027	2028	2029	2030	Total 2026 to 2030
Dam safety	0.1	0.1	3.4	0.0	0.1	3.4	7.0
EPA Regulations	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NSW Water Quality/ testing& monitoring	5.1	2.8	2.9	2.8	2.6	2.6	13.7
Uplift in water maintenance	11.0	-1.6	-2.0	-2.5	-3.0	-3.0	-12.1
Raw water quality pre-treatment	0.0	0.5	0.7	1.4	2.2	2.2	7.0
Digitisation (in Corporate)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IT Project opex (in Corporate)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Digital metering	1.4	1.9	2.6	3.5	4.5	5.4	17.9
SCADA & OPS Control	1.4	1.9	2.4	2.4	2.4	2.4	11.4
Property costs	0.0	5.3	5.0	5.6	5.2	4.6	25.7
Research and innovation	1.1	0.8	1.2	0.7	1.2	0.6	4.4
Adjustment for unregulated costs	-2.0	0.5	-0.4	-0.0	-0.3	-0.3	-0.6
Adjustment for Right of Use (RoU) leases	2.6	2.9	1.7	2.1	1.8	1.7	10.1
Climate risk assessment and management program	0.4	0.8	0.6	0.6	0.6	0.6	3.0
Gross water step expenditure	21.2	15.9	17.9	16.5	17.2	20.1	87.5
Less efficiencies proposed by SWC	-13.6	-6.5	-9.8	-10.1	-11.3	-14.4	-52.1
Net water step expenditure	7.6	9.4	8.2	6.3	5.9	5.7	35.4

Source: AtkinsRéalis analysis. Note: efficiencies assumed to be pro-rata the gross step efficiency. Numbers may not sum due to rounding.

3.4.5 Step Expenditure – Wastewater service

The step is defined as any forward-looking step change in the efficient level of recurrent controllable opex due to a particular event, such as changes to regulation or the method of delivering a service. We have interpreted this as an exogenous driver such as meeting any changes from regulators, a change in external factors such as impact of growth in new development areas.

Sydney Water has proposed a range of step changes as summarised in Table 3-30 below. Proposed step changes are defined by item. We identified changes driven by external requirements (exogenous) and internal business need (endogenous).

We have reviewed each of the proposed step changes to ensure that the item meets the requirements of a step change, that the timing of the expenditure is appropriate, and the level of expenditure proposed is efficient.

Table 3-30 - Proposed STEP changes wastewater service ($FY25M)

Year ending $FY25M	2025	2026	2027	2028	2029	2030	Total 2026 to 2030
Hawkesbury Nepean Nutrient Offset Framework	0.0	10.5	13.0	13.5	16.0	12.5	65.5
Climate risk assessment and management program	0.4	0.8	0.6	0.6	0.6	0.6	3.0
EPA regulations (including biosolids, spoils classification and environmental monitoring)	1.7	1.8	1.9	1.6	1.4	1.3	8.1
NSW Health water quality testing and monitoring	1.1	1.2	1.3	1.1	0.9	0.9	5.4
Uplift in wastewater maintenance	23.9	28.7	28.5	26.9	27.6	27.9	139.6
Green Renewable Energy Certificates	0.1	-0.3	-0.8	-1.5	-1.6	-2.3	-6.6
Mamre Road/Western Sydney Aerotropolis operational and maintenance costs	1.6	1.9	3.0	6.7	13.9	21.6	47.1
Digitalisation	2.1	2.1	1.9	2.0	2.3	2.5	10.7
IT project opex	2.4	3.1	1.5	1.0	0.3	1.3	7.2
SCADA & OPS Control	1.6	2.1	2.7	2.7	2.7	2.7	13.0
Property costs	4.5	4.3	4.5	4.3	4.4	4.0	21.4
Research and innovation	1.0	0.7	0.9	0.6	0.9	0.6	3.8
Adjustment for unregulated costs	-2.1	-2.2	-2.3	-1.2	1.4	1.1	-3.2
Adjustment for Right of Use (RoU) leases	2.2	1.0	0.2	0.6	0.6	0.7	3.1
Gross water step expenditure	40.5	55.9	56.9	58.8	71.3	75.2	318.1
Less efficiencies proposed by Sydney Water	-16.8	-18.8	-7.0	-8.3	-8.0	-8.5	-50.7
Net wastewater step expenditure	23.7	37.1	49.9	50.6	63.2	66.7	267.4

Source: SIR bts spreadsheet. Note: numbers may not sum due to rounding

Digital, property costs and 'adjustment of lease' costs are reviewed in Section 3.4.8 Corporate step expenditure. We have not reviewed expenditure less than $5M over the period as this is not considered a material step in expenditure and could be managed in the base year operating expenditure envelope.

3.4.5.1 EPA Regulations for biosolids

Expenditure reported in the water service in Section 3.4.4 is included here in the wastewater service as all costs (average $2.7M p.a.) relate to biosolids. The drivers for additional expenditure comprise:

- **Spoils classification:** following a review by consultants, the need for additional sampling and testing was recognised for compliance with the Waste Classification Guidelines.

- **Biosolids:** this is for additional monitoring and analytes to achieve the anticipated NSW EPA regulatory requirements for the biosolids. While the additional regulations have yet to be confirmed, the scope is detailed in the EPA consultation document.
- **Trade Waste volatile organic compounds (VOC) monitoring:** an enhanced monitoring plan for early detection and rapid response to trade effluent discharges follows significant and concentrated trade waste inflows at Malabar WRRF and a more general increase in chronic total petroleum hydrocarbons (TPH) / volatile organic compounds observed across industrial sewerage catchments. The aim is to enable Sydney Water to meet environmental standards at wastewater treatment works. The proposed costs include the roll-out of loggers, their maintenance and consumables, sampling and laboratory testing, as part of Sydney Water's monitoring plan.
- **Sydney Water Aquatic Monitoring (SWAM):** this is for additional monitoring sites, analytes, pilot programs and research into new methods required under the SWAM program.

We have accepted these expenditures assuming that the general efficiency savings will apply. Sydney Water has proposed operating expenditure as shown in Table 3-31. We have accepted these costs noting that step efficiencies will be applied.

Table 3-31 - EPA Regulations

Year ending $M 25	2025	2026	2027	2028	2029	2030	Total 2026 to 2030
Input as water service	1.5	1.8	1.8	1.7	1.7	1.7	8.8
Input as wastewater service	1.7	1.8	1.9	1.6	1.4	1.3	8.1
Total step change in wastewater	3.2	3.6	3.7	3.4	3.1	3.0	16.8
Upper and lower scenarios							
Water quality and environment testing and monitoring	3.2	3.6	3.7	3.4	3.1	3.0	16.8

Source: RFI193. Note: numbers may not sum due to rounding.

3.4.5.2 NSW Health water quality

This is a water service obligation, and all step costs are included in Section 3.4.4 above.

3.4.5.3 Compliance with Hawkesbury Nepean Nutrient Offset

This activity relates to discharges from wastewater treatment plants in the Yarramundi (3 sites) Sackville (2) and Berowra zones to the Hawkesbury Nepean catchment. This project is to support changes to Environmental Regulations to improve waterways health.

The new Hawkesbury Nepean Nutrient Management Framework (HNNMF) comes into being from July 2025. From this date, the 50th percentile concentration limits for total nitrogen and total phosphorus are to be revised to 6 mg/l and 0.1mg/l respectively. The HNNMF will also regulate total loads discharged to the Hawkesbury Nepean to reduce the likelihood of algal blooms and aquatic weed outbreaks in the sub-zones. The current load limits for nitrogen are to be reduced significantly and, for most sub-zones, below current levels.

There are two elements to this work: nutrient offsets and investigations:

- The Concentration and Load Review Strategic Project (the EPA Stage 2 study); and
- The Hawkesbury Nepean Offset project.

Expenditure forecasts for the two projects are shown in Table 3-32 below.

Table 3-32 - Hawkesbury Nepean Nutrient Offset

Year ending $FY25M	2025	2026	2027	2028	2029	2030	Total 2026 to 2030
EPA Stage 2 Study	0.0	1.7	4.3	4.7	4.7	4.7	20.1
HN Offsets	0.0	8.8	8.7	8.8	11.3	7.8	45.4
Hawkesbury Nepean Nutrient Offset Framework	0.0	10.5	13.0	13.5	16.0	12.5	65.5

Source: RFI 170

The concentration and Load Limit review Strategic Project is a joint project with the EPA and Sydney Water. Stage 1, which was a review of concentrations limits, has been completed. New limits were primarily based on historical performance and were implemented in 2020. The Stage 2 study requires a comprehensive review of the concentration and load limits for individual wastewater treatment plants. Pollution studies are required by the EPA in its letter dated 11th April 2024. The scope of the Stage 2 studies has been defined by the EPA:

> *The objective of the study is to characterise discharges to water from the premises and better understand the ongoing risks and environmental impacts of these discharges. The results of the study will be used for the purposes of determining reasonable and feasible future concentration and load limits on the licence as well as ultimately determining and implementing a program of works (as needed to reduce impacts from discharges to water of pollutants with the highest environmental risks across Sydney Water's EPL's)[16].*

These investigations meet the definition of a step change.

The outcomes of the Stage 2 studies will be an understanding of the risks and environmental impacts from discharges, and the ability to define new load and concentration limits based on assessment of reasonable and feasible levels of treatment.[17]

Studies for Stage 2 will begin with a pilot study of four plants at Bondi, Rouse Hill and West Camden and Riverstone. Expenditure forecasts are shown in Table 3-32 above. The pilot tranche of four plants will be designed and roll out will begin in 2025/26. Design of further tranches of investigations will be modified to accommodate any EPA feedback.

It appears from the EPA requirements that the results of the studies will be used for determining reasonable and feasible future concentration and load limits on each licence. These will then identify a program of works to demonstrate how treatment plants can be designed and operated to reduce pollutants in the discharges. The results of the studies will be used to identify capital works although these are not likely to be implemented before 2030.

The forecast expenditure for the proposed studies includes monitoring, sampling, analysis, impact assessment and reporting of the results. The estimate includes $2M p.a. as 'planning for infrastructure'. This appears to be a broad assumption; we question whether this is efficient.

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[16] RFI170
[17] RFI71, Sydney Water December 2024

The Offsets project is designed to reduce the levels of nitrogen and phosphorus in the catchment through riverbank stabilisation. A pilot project was carried out at Camden in 2024 to remove woody weeds and stabilise and revegetate 170m of riverbank along the Nepean River. The total cost was about $1M for work carried out by the Soil Conservation Service over a four-month period. Nutrient benefits were modelled by Soil Conservation Service.

Sydney Water has adopted the scenario of seven primary and secondary erosion events being prevented over a 10-year period by the riverbank stabilisation. An offset of 740 kg of total nitrogen and 480 kg of phosphorus was estimated following discussion with the EPA.

The proposals for the future period are to carry out similar works at 38 sites within the catchment, an average of 7 to 8 completed sites each year. The estimated cost is $45.3M based on the costs at the Camden site.

A business case is being prepared for approval; this implies that the proposals have yet to be reviewed and subject to internal challenge. Our view is that this program is ambitious, extrapolated from one pilot site when the benefits have been challenged by the EPA. We suggest that further pilot studies are carried out to demonstrate the robustness of the benefits, hence efficiency, before a full-scale program is implemented. We suggest about three sites per year in 2026 and 2027. These representative sites are selected for implementation to prove the concept, costs and benefits. This would be followed by five sites per year over the remaining three years; this would form the upper scenario. The lower scenario assumes site testing to prove the concept over three years then five sites per year.

These offset works meet the definition of a step change although we challenge the scope and timing of expenditure. Expenditure in 2024 was about $1M so the step change needs to recognise this base year cost.

Table 3-33 - Hawkesbury Nepean Nutrient Offset – Upper and lower scenario expenditure

Year ending $FY25M	2025	2026	2027	2028	2029	2030	Total 2026 to 2030
EPA Stage 2 Study	0.0	1.7	4.3	4.7	4.7	4.7	20.1
HN Offsets	0.0	8.8	8.7	8.8	11.3	7.8	45.4
Sydney Water total	0.0	10.5	13.0	13.5	16.0	12.5	65.5
Upper scenario							
Adjust for EPA study infrastructure planning	0.0	0.0	-1.0	-1.0	-1.0	-1.0	-4.0
Adjust for expenditure in 2024	0.0	-1.0	-1.0	-1.0	-1.0	-1.0	-5.0
Rephasing of the HN offsets	0.0	-5.2	-5.1	-2.8	-5.3	-1.8	-20.2
Hawkesbury Nepean Nutrient Offset net of adjustments	0.0	4.3	5.9	8.7	8.7	8.7	36.3
Lower scenario							
Adjust for EPA study infrastructure planning	0.0	0.0	-1.0	-1.0	-1.0	-1.0	-4.0
Adjust for expenditure in 2024	0.0	-1.0	-1.0	-1.0	-1.0	-1.0	-5.0
Rephasing of the HN offsets	0.0	-5.2	-5.1	-5.2	-5.3	-1.8	-22.6
Hawkesbury Nepean Nutrient Offset net of adjustments	0.0	4.3	5.9	6.3	8.7	8.7	33.9

Source: AtkinsRéalis analysis. Note: numbers may not sum due to rounding.

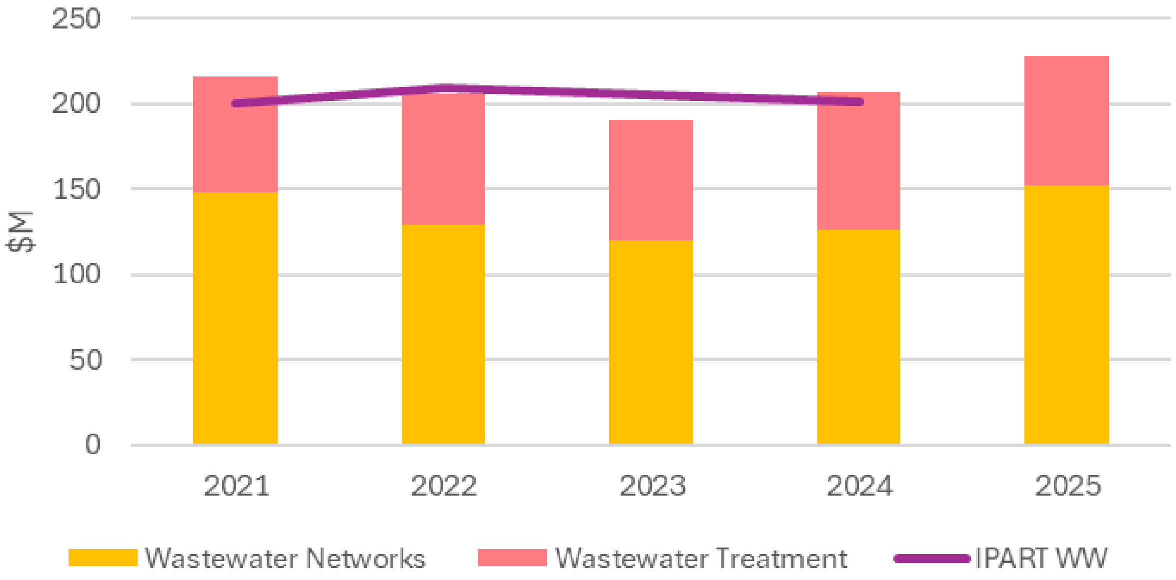
3.4.5.4 Wastewater maintenance

Current Period expenditure and performance

We have reviewed the overall profile of maintenance expenditure in the current period summarised in Figure 3-28 below. This graph compares actual expenditure against the IPART determination. Over the current period, expenditure was 4% below the determination with lower expenditure in 2022 and 2023 following the period of Covid restrictions. Year 2025 expenditure, while not part of the determination, reports a similar level as 2024.

In this section, we discuss wastewater maintenance. Over the current period, wastewater networks showed an even trend with an average $135M; lower expenditure in 2022 and 2023 was offset by increases in 2024 and forecast for 2025. For wastewater treatment, maintenance expenditure also showed an even trend with an average $75M over the period.

Figure 3-28 – Total Wastewater maintenance expenditure over the current period ($M25)



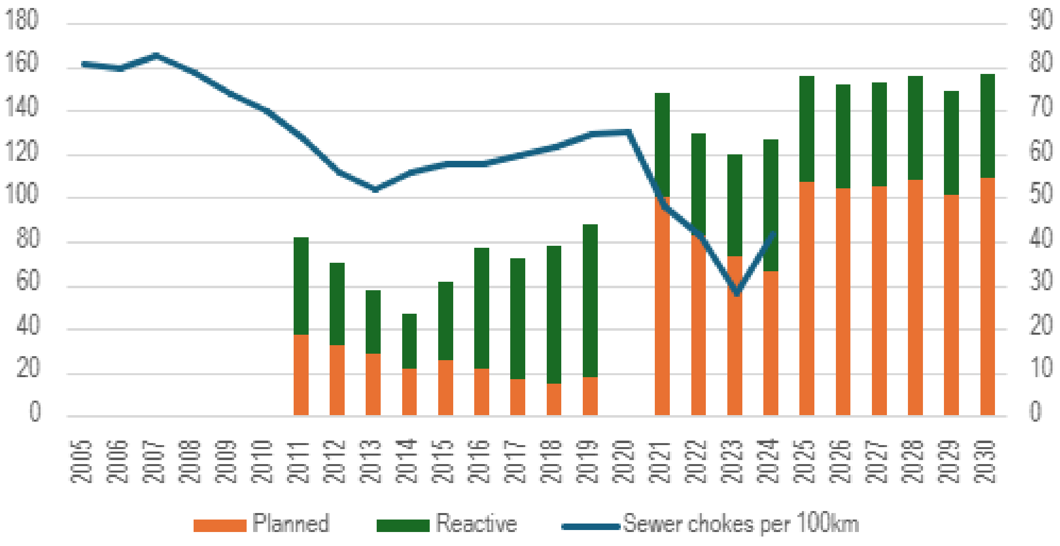
Source: Presentation 4Q, Sydney Water and AtkinsRéalis analysis

Sewer breaks and chokes

A key measure for the wastewater service is the number of sewer chokes and breaks. Many of the breaks relate to tree roots seeking water, particularly during dry years. This then impacts on the number of dry weather overflows. There is a long-term reducing trend in sewer chokes over the period from 2005 to 2024, with a small increase in 2024. The drought ended in 2020 with wetter years to 2024. This trend is shown in Figure 3-29. The figure also shows actual and forecast network expenditure for planned and reactive maintenance from 2011, all at the 2025 price base. Figure 3-29 shows a significant increase in planned maintenance expenditure over the period 2021 to 2024 compared with previous years. This impacted on the extent of sewer chokes as root penetration was less in the recent wetter years. Proposed planned maintenance expenditure to 2030 shows a step increase over the current period, contrary to the trend in breaks and chokes.

We comment on the wastewater network performance in Section 3.3.2. The number of dry weather overflows from networks and sewage pumping stations exceeded the standard. The number of pollution events increased from 2022 to 2024 to a peak of over 1000 in 2024. The quality of treated wastewater for core pollutants against EPA standards is 96.2% falling to 84.6% in 2026 then improving to 100% by 2030.

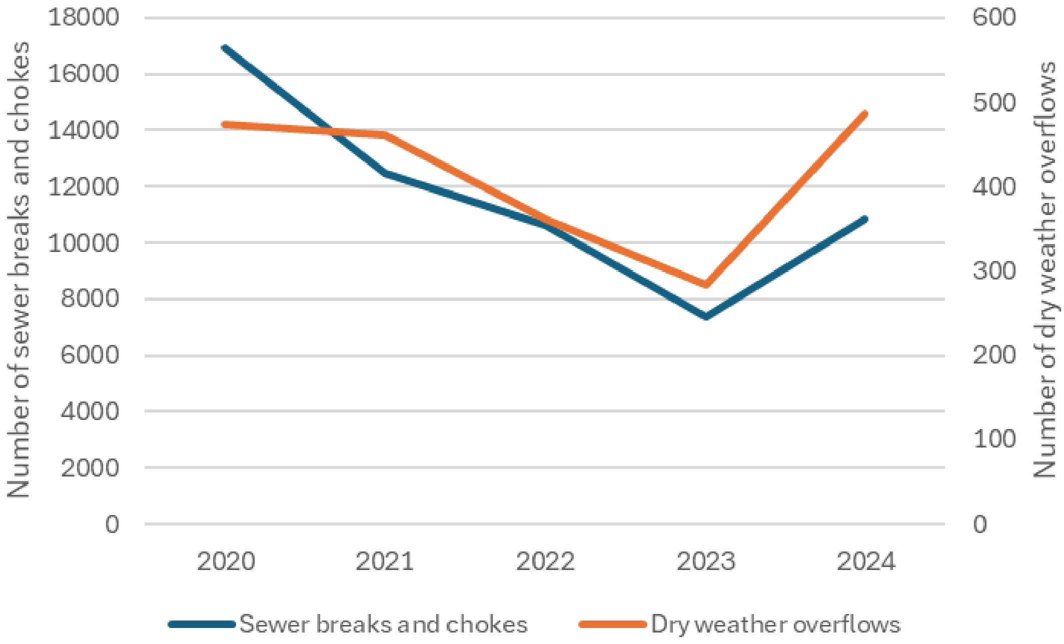
Figure 3-29 - Long term trend in sewer chokes compared with maintenance expenditure



Source: Sydney Water RFI2 and AtkinsRéalis data

Figure 3-30 shows a reducing trend in dry weather overflows over the current period although a return to 2020 level by 2024. The number of sewer chokes shows a similar trend. The dry weather overflow standard is for nil overflows. This reducing number has allowed Sydney Water to reduce the number of clear ups following these events and forecasts reducing costs in these areas.

Figure 3-30 - Performance against the dry weather overflow and chokes measures



Source: RFI2

We concluded that while there is a reducing trend in bursts and chokes, the number of dry weather overflow is significant and over the limit. Further work is needed to focus on those areas of the network that are at risk.

Maintenance expenditure in the future period

Sydney Water has proposed a step increase in maintenance expenditure for the wastewater networks as shown in Table 3-34.

Table 3-34 - Step change proposed by Sydney Water in network expenditure from the 2024 base year

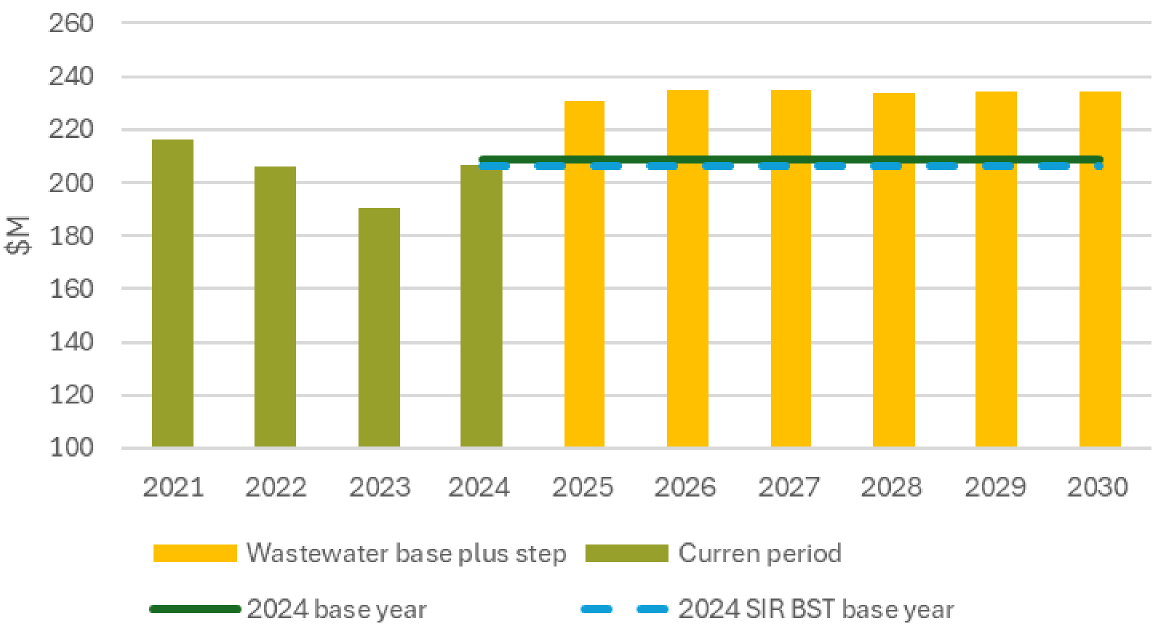
$FY25M	2024	2025	2026	2027	2028	2029	2030	Total 2026-30
Uplift in wastewater maintenance	0.0	23.9	28.7	28.5	26.9	27.6	27.9	139.6

Source: SIR BTS worksheet. Note: numbers may not sum due to rounding

Sydney Water has assumed a positive adjustment of $2.2M to derive the normalised 2024 expenditure. This is not consistent with the -$3.85M adjustment presented in the SIR bts worksheet. A further adjustment has been made to the base year to account for the 'end year adjustment'. However, an 'end year adjustment' has already been made in Table 3-5 and in the SIR bts worksheet. We have to assume that the SIR submission reflects Sydney Water's position, although the difference is not material. If there have been end year adjustments post submission, then they need to be included both in the SIR and the maintenance expenditure to be consistent.

Figure 3-31 shows the profile of total wastewater maintenance expenditure from 2021 to 2030. The average expenditure in the current period is $205M p.a., similar to the 2020 determination. This increases to $235M p.a. (15%) over the future period.

Figure 3-31 - Wastewater expenditure in current and future period



Source: RFI252 and AtkinsRéalis analysis

Sydney Water proposes efficiency savings of $7.1M p.a. over the future period and also for 2025. A step change has been applied to ten maintenance activities representing 88% of the total budget. A summary of proposed expenditure is shown in Table 3-35.

Table 3-35 – Sydney Water step increases in wastewater maintenance expenditure

Year ending $FY25M	2024	2025	2026	2027	2028	2029	2030	Total 2026-30
Water resources recovery	80.3	0.5	6.3	7.5	9.1	15.4	14.9	53.2
Manhole inspection	4.3	2.3	1.6	1.6	1.7	1.7	1.7	8.3

Root cutting	10.8	0.3	0.2	0.1	0.1	0.1	0.1	0.6
Clean up post sewer spill	10.6	-1.3	-1.0	-1.0	-1.0	-1.0	-0.8	-4.8
Network repair	19.8	2.6	3.3	3.5	1.7	1.9	2.1	12.5
Other wastewater corrective	11.0	1.1	0.7	0.7	1.0	1.1	1.3	4.8
NGRS	0.0	9.3	8.2	6.2	6.2	0.0	0.0	20.6
Network desilting	7.3	6.2	5.9	6.1	6.2	6.4	6.5	31.1
Vent shafts	2.0	1.2	1.2	1.1	-0.9	-0.9	-0.9	-0.5
Network facilities	35	1.8	2.2	2.5	2.8	3.0	3.2	13.7
Rest of maintenance	25.2							
Total 2024+	206.6							
Total Wastewater step changes+		24.0	28.6	28.3	26.9	27.7	29.0	140.5
Efficiency		-6.0	-7.0	-7.2	-7.6	-7.5	-7.5	-36.8
Total wastewater net increase		18.0	21.6	21.1	19.3	20.2	21.5	103.7

+ Data for individual components are only available to 1 decimal place and therefore may not sum to total values that are shown in Table 3-34
Source: Sydney Water Presentation 6b

Water resources recovery (wastewater treatment): this shows an increasing annual expenditure from $6.3M p.a. in 2026 to $14.9M p.a. from the 2024 base. There are significant expenditures in 2029 and 2030. Sydney Water attributes some of this later increase to treatment upgrades at the West Camden, Glenfield and Liverpool sites. The performance of the water resource recovery plants is discussed in Section 4.6.2.1.

The business has provided a summary of unplanned jobs (assumed to be reactive work orders) by year. This suggests that there was an increase from FY13 to FY15 (at the start of the [redacted] maintenance contract), then a step up from FY18 to FY19. After FY19 job numbers are more stable with an increase in FY24. We note the business's explanation that the increase in FY19 failures was due to the outsourced maintenance provider not performing planned maintenance as the contract was coming to an end[18].

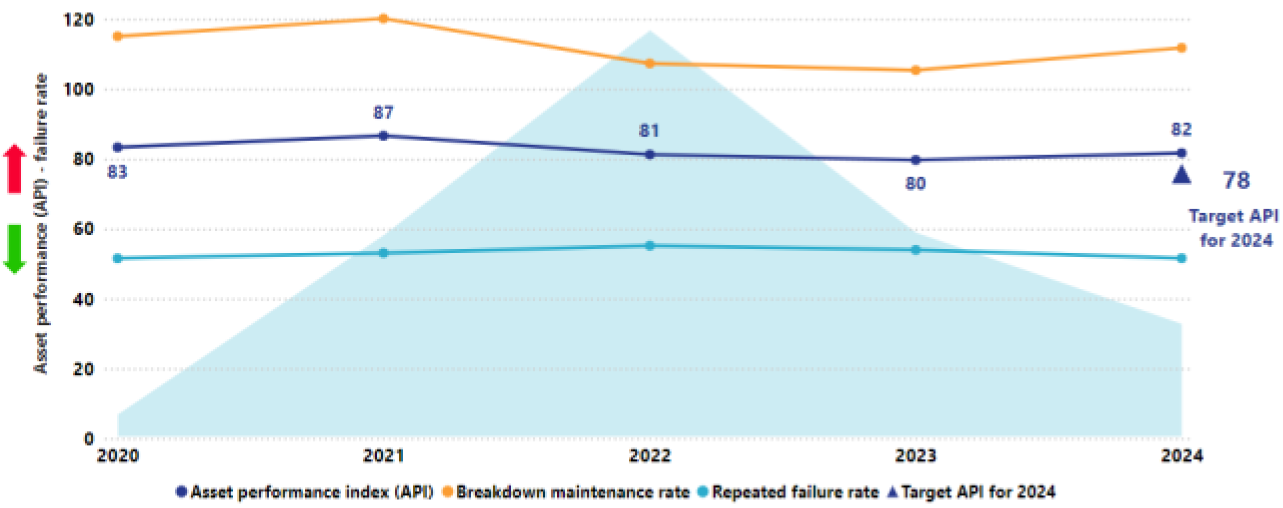
However, we note that these are 'raw' numbers (i.e. they don't take account of number of assets over time and an increase in reactive work orders can sometimes be the result of a change in policy or approach (e.g. a switch from a proactive to reactive approach or classification/data capture changes). As suggested by Sydney Water, it does seem likely that the outsourced contract may have affected the underlying numbers and/or classification of unplanned jobs. See Figure 4-25 in the Section covering asset renewal.

The 2024 State of the Assets report classifies water resources recovery facility (WRRF) asset performance as stable in FY22, 23, and 24[19]. This is supported by breakdown maintenance rate and repeat failures as shown below:

[18] Sydney Water RFI 79, 84, 98, 99, 100, 103, 130, 135, 141, 142, 199

[19] Ref: Table 7 of State of the Assets Report FY24

Figure 3-32 - WRRF asset performance



Source: State of the Assets Report FY24

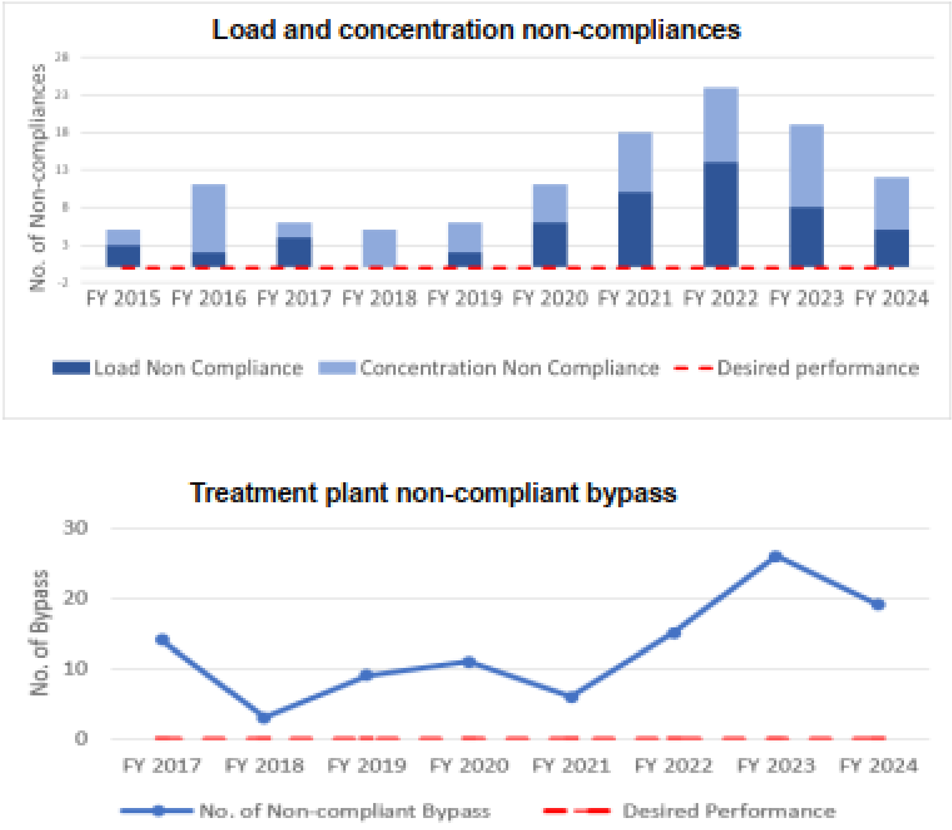
The WRRF Investment Plan states that the condition of assets is considered as "deteriorated" stating:

> *Condition of water resource recovery facilities is continued to be rated as red in 2023-24 as the asset performance has slightly declined and programs need to be fast tracked to manage the deterioration. The modelling and condition assessment have shown that an increasing number of assets are approaching*

We acknowledge that the plan states that overall asset performance of the WWRFs declined slightly in FY24. However, the explanation given for the WRRF asset condition red category is confusing given that Table 7 of the State of the Assets Report FY24 indicates performance is 'stable' and a single and slight year-on-year decline is not normally taken as indicative of deterioration, especially when performance is better or the same as four years ago.

Sydney Water has highlighted the impacts of recent wet years on the performance of its wastewater system. In its presentation of the WRRF renewals program the business highlighted performance against two metrics:

Figure 3-33 - WRRF compliance trends for two parameters



Source: Sydney Water presentation 3H

It explained that *"frequent upgrades are needed due to growth and capacity limitations, aging infrastructure, and new effluent limits*".

In terms of relevant key system performance metrics, we note[20]:

- Load and concentration limit non-compliances were at 12 in FY24 which is in line with the business's own target. The State of the Assets Report highlights the importance of plant optimisation and upgrades as well as regulatory responses to extreme wet weather periods.
- Treatment Plant Non-Compliant Bypass: these were at 19 in FY24 with an improving trend. Of these there were 'a small number of asset failure related non-compliant bypasses'.
- Dry Weather overflow (measure L1.3): at 246 was well within the business's own target of 270 or below.

In summary we note that the business is proposing a significant step up in maintenance expenditure especially from FY27 on. There does appear to be an increase in the number of unplanned jobs being carried out compared to the pre 2019 period. However, we have limited confidence in the meaningfulness of the data given the effects of in-housing in 2020, the broadly stable situation since 2019 and the breakdown maintenance rate, asset performance index and repeated failure rates in FY23 and FY24 being the same as or better than FY20 and 21 for example.

For the upper scenario, we are not convinced of the significant increase in maintenance expenditure for the future period. We have therefore assumed that the step increase in maintenance is half that proposed. Where major

[20] Based on the text and tables in Section 3.2 of the Water Resource Recovery Facility Renewals Program Investment Plan

projects are commissioned in later years, we would expect a reduction from the base case due to the new asset conditions. For the lower scenario we assume there would be no increase in asset maintenance from the 2024 base.

The wastewater environmental response: this comprises manhole inspection, root cutting and clean up. Expenditure in 2024 was $25.7M. Manhole inspection work is forecast to increase by nearly 40% above the 2024 base by 2030 while there is a marginal increase in root cutting, conversely savings are forecast in clean-up activities. Overall, this represents a net increase of $0.86M p.a. This is an increase of 3.3% p.a. over the 2024 base. This activity is to limit dry weather overflows through use of sensors and proactive manhole inspections to reduce dry weather overflows and reduce the cost of clean-up. Performance on dry weather overflows showed a reducing trend over the current period from 473 in 2020 to 284 in 2023 and then an increase to 487 in 2024. We accept this expenditure for the Upper scenario. For the lower scenario in a constrained market, we assume no increase on the 2024 level.

Network repair and other corrective maintenance: this is to follow up from inspections, CCTV surveys, operational assistance and some reactive work. Current 2024 expenditure is $30.8M with a step increase of $3.4M by 2030 representing an 11% increase. Sydney Water assumes drier years in the future period resulting in additional activities on the network. When we look at historical trends in sewer chokes in Figure 3-29, there is a significant reducing trend to 2024 While there is an increasing trend during the dry years of 2013 to 2019, there is then a marked reduction to 2023. This relates to a significant increase in expenditure in the current period. While there are maintenance issues to address in network repairs, we are not convinced that the proposed step increase is supported. For the upper scenario we have supported the step increase in network repairs. For the lower scenario, we have assumed that the base year expenditure applies.

Network desilting: There are two components. Firstly, a desilting project for the North Georges River Submain (NGRS). Additional desilting work is proposed commencing in 2025 with completion in 2028 with an opex component of $20.6M above the 2024 base. A business case was provided (RFI213) which was approved in December 2023. The program showed a start in February 2024 and completion in June 2025. The opex component of the project was approved as $14.4M (2025 price base). The cash flow in the step expenditure profile indicates a start in 2025 and completion in 2028, an extended period compared with the business plan proposals. Future packages presented in para 5.2 of the business plan shows a lower cost profile. We formed the view that the proposed expenditure profile should be consistent with the approved business plan, to 2025 price base, unless there was good reason to vary this.

Desilting work is proposed at other sites at $6.2M p.a. average above the $7.2M in 2024. This as nearly double the 2024 base with no specific projects identified. We suggest that the upper scenario include for the NGRS project but only $3M p.a. for the other dredging. The lower scenario would include the $14.4M to the NGRS but no further dredging work, as this represents the business working in a constrained environment.

Network facilities: these facilities comprise sewage pumping stations, chemical dosing plants, odour control units, vacuum sewage systems and low-pressure sewer pump units. The proposed step change represents a $2.7M p.a. increase (7.7%) above the $35.0M 2024 base. While these assets are reported as being ‘stable’., the assets represent a range of facilities which often get overlooked when assessing maintenance needs and risks of failure. We accept the need although the proposals should progress through a business plan assessment to test the solutions and costs. For the upper scenario we have therefore assumed half of the step increase proposals; the lower scenarios assume no change from the 2024 base.

3.4.5.5 AtkinsRéalis adjusted step expenditure

The net wastewater expenditure as recommended by AtkinsRéalis is summarised in Table 3-36 for the upper scenario and Table 3-37 for the lower scenario.

Table 3-36 – Recommended Wastewater Step expenditure: upper scenario

$FY25M	2024	2025	2026	2027	2028	2029	2030	Total 2026-30
Water resources recovery	80.3	0.5	3.2	3.8	4.6	4.6	4.6	20.6
Manhole inspection	4.3	2.3	1.6	1.6	1.7	1.7	1.7	8.3
Root cutting	10.8	0.3	0.2	0.1	0.1	0.1	0.1	0.6
Clean up post sewer spill	10.6	-1.3	-1	-1	-1	-1	-1	-5
Network repair	19.8	2.6	1.7	1.8	0.9	1.0	1.1	6.3
Other wastewater corrective	11	1.1	0.7	0.7	1	1.1	1.3	4.8
NGRS	0	9.3	8.2	6.2	0	0	0	14.4
Network desilting	7.3	6.2	3.1	3.1	3.1	3.1	3.1	15.5
Vent shafts	2	1.2	1.2	1.1	-0.9	-0.9	-0.9	0.5
Network facilities	35	1.8	1.1	1.25	1.4	1.5	1.6	6.85
Rest of maintenance	25.2							
Total 2024	206.6							
Total Wastewater step changes		24.0	19.9	18.6	10.8	11.1	12.6	73.0
Efficiency		-6.0	-4.9	-4.7	-3.1	-3.0	-3.3	-18.9
Total wastewater step increase		**18.0**	**15.0**	**13.8**	**7.7**	**8.1**	**9.3**	**54.0**

Source: AtkinsRéalis analysis. Note: numbers may not sum due to rounding

Table 3-37 – Recommended Wastewater Step expenditure: lower scenario

$FY25M	2024	2025	2026	2027	2028	2029	2030	Total 2026-30
Water resources recovery	80.3	0.5	0	0	0	0	0	0
Manhole inspection	4.3	2.3	0	0	0	0	0	0
Root cutting	10.8	0.3	0	0	0	0	0	0
Clean up post sewer spill	10.6	-1.3	0	0	0	0	0	0
Network repair	19.8	2.6	0	0	0	0	0	0
Other wastewater corrective	11	1.1	0	0	0	0	0	0
NGRS	0	9.3	8.2	6.2	0	0	0	14.4
Network desilting	7.3	6.2	0	0	0	0	0	0
Vent shafts	2	1.2	1.2	1.1	-0.9	-0.9	-0.9	-0.4
Network facilities	35	1.8	0	0	0	0	0	0
Rest of maintenance	25.2							
Total 2024	206.6							
Total Wastewater step changes		24.0	9.4	7.3	-0.9	-0.9	-0.9	14.0
Efficiency		-6.0	-2.3	-1.9	0.3	0.2	0.2	-3.4
Total wastewater net increase		**18.0**	**7.1**	**5.4**	**-0.6**	**-0.7**	**-0.7**	**10.6**

Source: AtkinsRéalis analysis. Note; numbers may not sum due to rounding

Sydney Water is proposing efficiency savings to the wastewater expenditure at an average $7.4M p.a. over the future period. This is equivalent to 3.0% to 3.3% per annum. It states that these efficiencies can be delivered through the recently implemented Flow program delivering savings through several field operations including reducing unnecessary site visits, reduced travel time, reduced response time and regulatory action and improved planned and corrective maintenance planning. Given the scope reductions in the recommended upper and lower scenario expenditure, efficiencies have been reduced pro-rata to the recommended step changes.

3.4.5.6 Mamre Road/ Western Sydney

This step expenditure relates to the additional operating expenditure driven by the growth development in western Sydney. This expenditure relates to operation and maintenance expenditure; additional land taxes are reported elsewhere in the SIR bts spreadsheet under non-controllable costs.

We comment on the capital expenditure elements of the growth program in Section 4.5.5. In the table below, operating expenditure in relation to the proposed capital projects are reported in the SIR BTS worksheet. Operating expenditure relates to maintaining trunk drainage corridors, regional basins, stormwater harvesting, stormwater treatment and recycling.

Table 3-38 – Mamre Road and Aerotropolis operating and maintenance expenditure

Year ending $FY25M	2025	2026	2027	2028	2029	2030	Total 2026 to 2030
Other opex (unallocated)	1.5	-	-	-	-	-	
Trunk Drainage Corridors (naturalised and existing)	0.1	0.4	0.8	1.8	3.8	5.8	12.6
Regional Basin (wetland, bio, ponds, pipe connections etc.)	0.0	0.2	0.5	1.3	2.9	4.8	9.6
Stormwater Harvesting (pumps, pipes and renewal)	0.0	0.0	0.1	0.2	0.4	0.7	1.3
Stormwater treatment (filtration, chlorination, and UV)	0.0	0.6	0.6	1.2	2.2	3.3	7.9
Recycled Water (reservoir, distribution pipes, pumps, and renewal)	0.0	0.6	1.0	2.3	4.6	6.9	15.4
Stormwater licencing - Opex	-	0.1	0.0	0.1	0.1	0.1	0.3
Total operation and maintenance	1.6	1.9	3.0	6.7	13.9	21.6	47.1

Source: RFI165/166 proposed worksheet. Note: numbers may not sum due to rounding

We noted that detailed estimates had been prepared for each area of operation and maintenance related to capital works from land management to process operations. The timing of any opex will be dependent on completion, handover and operational testing of new processes.

This type of work is relatively new to Sydney Water and the form of procurement should reflect the type of contractor employed for this work. There are likely to be efficiencies made in procuring specialist contractors in these areas rather than assume directly employed teams.

A detailed estimate of operating expenditure has been prepared, based on the capital components of the proposals including drainage corridors, wetlands, stormwater harvesting, treatment and recycled water. A greater part of the operating expenditure uses a percentage of the capital works which may be acceptable for capital project approval but is broad based and is not benchmarked against the other operating and maintenance costs in the business. We find it unreliable to base changes in operating costs directly to the cost of capital works.

The stormwater treatment requirements are not clearly defined. The need for and timing of recycling water production should be more clearly defined. We understood there are in the medium-term plan and full operation is beyond 2030.

We formed the view that routine maintenance activities such as trunk drainage corridors, regional basins and stormwater harvesting could be carried out at lower cost through more effective procurement and using skills which are available on the market but not necessarily in Sydney Water. In the upper scenario, we have applied a 20% cost reduction; for the lower scenario we have applied a 35% reduction.

The extent of stormwater treatment and effluent quality requirements and their timing appears to be uncertain. Assuming that the full operating costs will only apply when works are complete and handed over, we have applied a two-year slippage to these activities.

We understood that the recycling works formed part of the medium term plan which would be post 2030 by the time works are completed and commissioned. This suggests that this operating expenditure is deferred to beyond 2030.

The recommended efficient expenditure for the upper and lower scenarios are shown in Table 3-39 and 40 below.

Table 3-39 – Mamre road recommended expenditure – upper scenario

Year ending $FY25M	2025	2026	2027	2028	2029	2030	Total 2026 to 2030
Other opex (unallocated)	1.5	-	-	-	-	-	
Trunk Drainage Corridors (naturalised and existing) opex	0.1	0.3	0.6	1.4	3.1	4.7	10.1
Regional Basin (wetland, bio, ponds, pipe connections etc.) Opex	0.0	0.1	0.4	1.0	2.3	3.8	7.7
Stormwater Harvesting (pumps, pipes and renewal) Opex	0.0	0.0	0.1	0.1	0.3	0.5	1.0
Stormwater treatment (filration, chlorination, and UV) - Opex	0.0	0.6	0.6	0.6	0.6	0.6	3.1
Recycled Water (reservoir, distribution pipes, pumps, and renewal) - Opex	0.0	0.6	1.0	0.6	1.0	0.6	3.9
stormwater licencing - Opex	-	0.1	0.0	0.1	0.1	0.1	0.3
Total operation and maintenance	**1.6**	**1.8**	**2.8**	**3.8**	**7.3**	**10.4**	**26.1**

Source RFI165, 166, and AtkinsRéalis analysis. Note: numbers may not sum due to rounding.

Table 3-40 – Mamre road recommended expenditure – lower scenario

Year ending $FY25M	2025	2026	2027	2028	2029	2030	Total 2026 to 2030
Other opex (unallocated)	1.5	-	-	-	-	-	
Trunk Drainage Corridors (naturalised and existing) opex	0.1	0.3	0.5	1.1	2.5	3.8	8.2
Regional Basin (wetland, bio, ponds, pipe connections etc.) Opex	0.0	0.1	0.3	0.8	1.9	3.1	6.3
Stormwater Harvesting (pumps, pipes and renewal) Opex	0.0	0.0	0.0	0.1	0.2	0.4	0.8
Stormwater treatment (filtration, chlorination, and UV) - Opex	0.0	0.6	0.6	0.6	0.6	0.6	3.2
Recycled Water (reservoir, distribution pipes, pumps, and renewal) - Opex	0.0	0.6	1.0	0.6	1.0	0.6	3.9
stormwater licensing - Opex		0.1	0.0	0.1	0.1	0.1	0.3
Total operation and maintenance	**1.6**	**1.7**	**2.6**	**3.4**	**6.3**	**8.7**	**22.6**

Source RFI165, 166, and AtkinsRéalis analysis. Note: numbers may not sum due to rounding.

3.4.5.7 AtkinsRéalis adjusted step expenditure

The gross wastewater expenditure as recommended by AtkinsRéalis is summarised in Table 3-41 for the upper scenario and Table 3-42 for the lower scenario.

Table 3-41 – Recommended Wastewater Step expenditure: upper scenario

Year ending $M 2025	2025	2026	2027	2028	2029	2030	Total 2026 to 2030
Hawkesbury Nepean Nutrient Offset Framework	0.0	4.3	5.9	8.7	8.7	8.7	36.3
Climate risk assessment and management program	0.4	0.8	0.6	0.6	0.6	0.6	3.0
EPA regulations (including biosolids, spoils classification and environmental monitoring)	3.2	3.6	3.7	3.4	3.1	3.0	16.8
NSW Health water quality testing and monitoring	1.1	0.0	0.0	0.0	0.0	0.0	0.0
Uplift in wastewater maintenance	24.0	19.9	18.6	10.8	11.1	12.6	73.0
Green Renewable Energy Certificates	0.1	-0.3	-0.8	-1.5	-1.6	-2.3	-6.6
Mamre Road/Western Sydney Aerotropolis operational and maintenance costs	1.6	1.8	2.8	3.8	7.3	10.4	26.1
Digitisation (in Corporate)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IT Project opex (in Corporate)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SCADA & OPS Control	1.6	2.1	2.7	2.7	2.7	2.7	13.0
Property costs	3.8	3.6	3.8	3.5	3.6	3.3	17.8
Research and innovation	1.0	0.7	0.9	0.6	0.9	0.6	3.8
Adjustment for unregulated costs	-2.1	-2.2	-2.3	-1.2	1.4	1.1	-3.2
Adjustment for Right of Use (RoU) leases	2.2	1.0	0.2	0.6	0.6	0.7	3.1
Gross wastewater step expenditure	36.9	35.4	36.1	32.0	38.4	41.2	183.1
Less efficiencies proposed by SWC	-15.3	-11.9	-4.5	-4.5	-4.3	-4.7	-29.9
Net wastewater step expenditure	21.6	23.5	31.6	27.5	34.0	36.6	153.2

Source: AtkinsRéalis analysis. Note: numbers may not sum due to rounding.

Table 3-42 – Recommended Wastewater Step expenditure: lower scenario

Year ending $M 2025	2025	2026	2027	2028	2029	2030	Total 2026 to 2030
Hawkesbury Nepean Nutrient Offset Framework	0.0	4.3	5.9	6.3	8.7	8.7	33.9
Climate risk assessment and management program	0.4	0.8	0.6	0.6	0.6	0.6	3.0
EPA regulations (including biosolids, spoils classification and environmental monitoring)	3.2	3.6	3.7	3.4	3.1	3.0	16.8
NSW Health water quality testing and monitoring	1.1	0.0	0.0	0.0	0.0	0.0	0.0
Uplift in wastewater maintenance	24.0	9.4	7.3	-0.9	-0.9	-0.9	14.0
Green Renewable Energy Certificates	0.1	-0.3	-0.8	-1.5	-1.6	-2.3	-6.6
Mamre Road/Western Sydney Aerotropolis operational and maintenance costs	1.6	1.7	2.6	3.4	6.3	8.7	22.6
Digitisation (in Corporate)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IT Project opex (in Corporate)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SCADA & OPS Control	1.6	2.1	2.7	2.7	2.7	2.7	13.0
Property costs	3.8	3.0	3.1	2.9	3.0	2.7	14.7
Research and innovation	1.0	0.7	0.9	0.6	0.9	0.6	3.8
Adjustment for unregulated costs	-2.1	-2.2	-2.3	-1.2	1.4	1.1	-3.2
Adjustment for Right of Use (RoU) leases	2.2	1.0	0.2	0.6	0.6	0.7	3.1
Gross wastewater step expenditure	36.9	24.2	23.9	16.8	24.7	25.4	115.1
Less efficiencies proposed by SWC	-15.3	-8.1	-3.0	-2.4	-2.8	-2.9	-19.1
Net wastewater step expenditure	21.6	16.1	21.0	14.4	21.9	22.6	96.0

Source: AtkinsRéalis analysis. Note: numbers may not sum due to rounding.

3.4.6 Step Expenditure – Stormwater service

The step is defined as any forward-looking step change in the efficient level of recurrent controllable opex due to a particular event, such as changes to regulation or the method of delivering a service. We have interpreted this as an exogenous driver such as meeting any changes from regulators, a change in external factors such as raw water quality or the impact of growth in new development areas.

Sydney Water has proposed a range of step changes as summarised in Table 3-43 below. Proposed step changes are defined by item. We identified changes driven by external requirements (exogenous) and internal business need (endogenous).

We have reviewed each of the proposed step changes to ensure that the item meets the requirements of a step change, that the timing of the expenditure is appropriate, and the level of expenditure proposed is efficient.

Table 3-43 – Proposed STEP changes stormwater service ($FY25M)

Year ending $FY25M	2025	2026	2027	2028	2029	2030	Total 2026 to 2030
Stormwater desilting	-0.1	-0.0	0.0	0.1	0.1	0.2	0.4
Stormwater remediation	0.0	3.7	4.0	4.1	4.3	4.5	20.6
Digitalisation	0.1	0.1	0.1	0.1	0.1	0.1	0.4
IT project opex	0.1	0.1	0.1	0.0	0.0	0.0	0.3
Property Costs	0.1	0.2	0.2	0.2	0.2	0.2	1.0
Research and innovation	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Adjustment for Right of Use (RoU) leases	0.0	0.1	0.0	0.1	0.0	0.0	0.2
Gross stormwater step expenditure	0.2	4.2	4.4	4.6	4.7	5.0	22.9
Less efficiencies proposed by Sydney Water	-2.0	-1.9	-2.3	-2.6	-2.7	-3.1	-12.6
Net stormwater step expenditure	-1.8	2.3	2.1	2.0	2.0	1.9	10.2

Source: SIR bts spreadsheet. Note: numbers may not sum due to rounding.

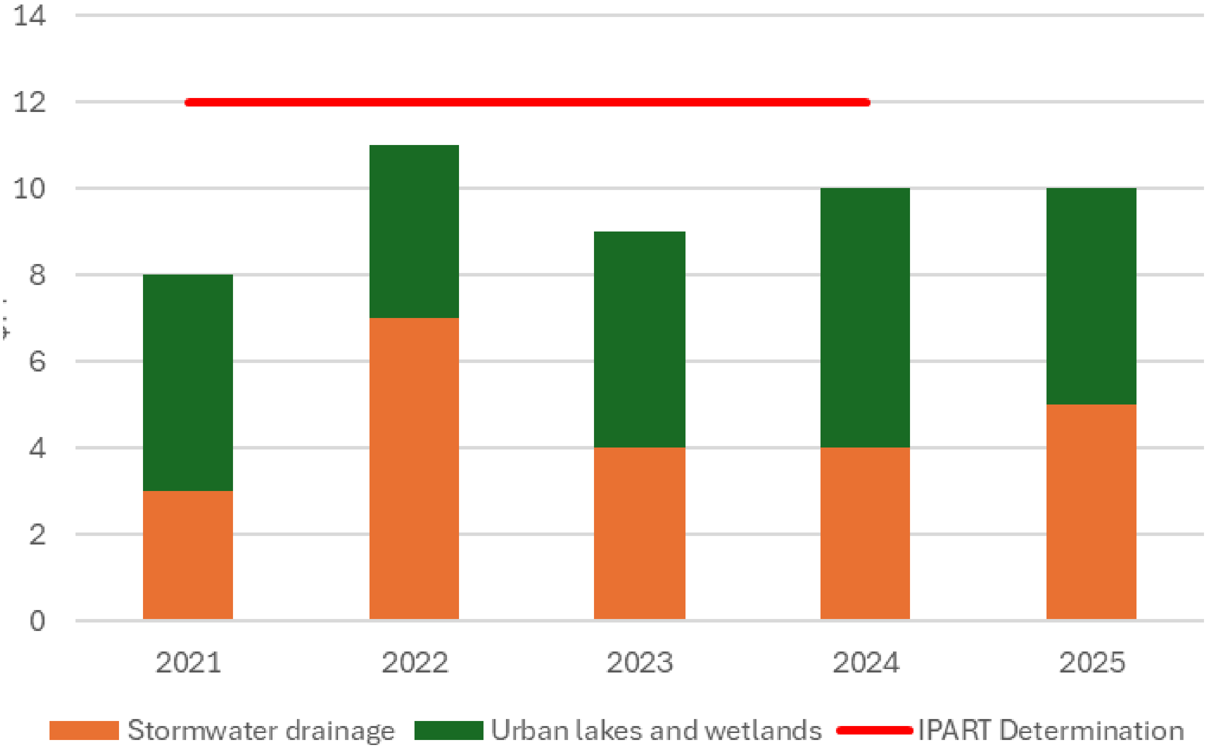
We focus on the stormwater remediation step change. Other elements of the step changes relate to a proportional allocation of expenditure to the stormwater service. Some elements, such as stormwater desilting, do not appear to meet the definition of a step because they are not significant cost increases.

Sydney Water Operating Licence and the Sydney Water Act 1994 obligations set out the obligations to manage and operate stormwater assets as designed.   Expenditure in the current period was an average $20M p.a.[21] in Table 7.1 of the submission, and $22M in 2024. Excluding the corporate overhead, this is an average of $17M p.a. over the current period and $16M in 2025, confirmed in the SIR BTS spreadsheet. This compares with the average expenditure of $10M p.a. over the current period reported in Presentation 5G.

In the current period, Sydney Water significantly underspent on stormwater maintenance against the IPART determination as shown below.

[21] Sydney Water submission Table 7.1

Figure 3-34 - Stormwater maintenance expenditure in current period



Source: Presentation 5E

The reduction in the 2021 expenditure was attributable to the Covid restrictions and further work was delayed because of wet weather.

3.4.6.1 Stormwater remediation

Sydney Water explained that the health of stormwater system is managed through a Performance, Cost, and Risk (PCaR) approach for decision making to meet levels of service, related to the Stormwater and Waterways Infrastructure Strategy. This has newly defined KPIs for Performance, Risk and Cost. Performance is through reducing customer complaints and maintaining existing flood capacity through maintenance programs. Risk mitigation through focusing on high risk assets and focusing cost through addressing maintenance and backlog, particularly for high-risk assets.

The main maintenance programs include, gross pollutant trap cleaning, channel and pipe desilting, periodic removal of silt and debris and reactive and emergency repairs. Bush regeneration and weed removal is also carried out. It would help to define more clearly the performance measures for stormwater maintenance to enable clearer monitoring in the future.

Expenditure in the current period included $3M p.a. in water channel desilting and gross pollution trap management, $1M p.a. on other activities such as condition assessments and smaller reactive repairs and $4M p.a. on bush regeneration for wetland and other land-based assets. Sydney Water commented that the underspend in desilting and condition assessments was due to long periods of wet weather and Covid causing access issues and preventing works from occurring.

Proposed expenditure for the period to 2030 comprises $15M p.a. for stormwater drainage ($5M p.a.) and lakes and wetlands ($9M p.a.). The increases over the 2024 base relates to:

- Increase in labour costs and market constraints (we suggest is covered in the trend forecast);

- The backlog of major desilting works that was delayed due to multiple wet weather years ($1M).
- Condition assessment including CCTV inspections ($1M) due to wet weather delays; and
- Additional $4M for planned major periodic desilting projects to prevent flooding of nearby properties and predictive increase in emergency repairs and maintenance due to more frequent severe weather event.

We accept the need to address the backlog of major desilting work and condition assessment, but question why this is not included in the current base year expenditure or backlog in year 2025 and therefore question the need for a step change.

Taking the low case scenario, we suggest that major desilting works could be managed within the opex envelope with no need for a step change, with a small allowance for emergency works. The upper scenario would be to accept half of the proposed step increase, assuming that this work program needs to go through internal business cases and review prior to approval, and the inclusion of labour real price effects in the trend analysis.

3.4.6.2 AtkinsRéalis adjusted step expenditure

The gross stormwater expenditure as recommended by AtkinsRéalis is summarised in Table 3-44 for the upper scenario and Table 3-45 for the lower scenario.

Table 3-44 – Recommended Stormwater step expenditure: upper scenario

Year ending $M 2925	2025	2026	2027	2028	2029	2030	Total 2026 to 2030
Stormwater desilting	-0.1	-0.0	0.0	0.1	0.1	0.2	0.4
Stormwater remediation	0.0	1.9	2.0	2.1	2.1	2.2	10.3
Digitisation (in Corporate)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IT Project opex (in Corporate)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Property Costs	0.1	0.2	0.2	0.2	0.2	0.2	0.8
Research and innovation	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Adjustment for Right of Use (RoU) leases	0.0	0.1	0.0	0.1	0.0	0.0	0.2
Gross stormwater step expenditure	0.1	2.1	2.2	2.3	2.5	2.6	11.7
Less efficiencies proposed by SWC	-0.8	-0.9	-1.2	-1.3	-1.4	-1.6	-6.5
Net water step expenditure	-0.8	1.1	1.0	1.0	1.1	1.0	5.2

Source: presentation 5E and AtkinsRéalis analysis. Note: numbers may not sum due to rounding

Table 3-45 – Recommended Stormwater Step expenditure: lower scenario

Year ending $M 2925	2025	2026	2027	2028	2029	2030	Total 2026 to 2030
Stormwater desilting	-0.1	-0.0	0.0	0.1	0.1	0.2	0.4
Stormwater remediation	0.0	1.0	1.0	1.0	1.0	1.0	5.0
Digitisation (in Corporate)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IT Project opex (in Corporate)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Property Costs	0.1	0.1	0.2	0.2	0.2	0.1	0.7
Research and innovation	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Adjustment for Right of Use (RoU) leases	0.0	0.1	0.0	0.1	0.0	0.0	0.2
Gross stormwater step expenditure	0.1	1.1	1.2	1.3	1.3	1.3	6.3
Less efficiencies proposed by SWC	-0.8	-0.5	-0.7	-0.7	-0.8	-0.8	-3.5
Net water step expenditure	-0.8	0.6	0.6	0.6	0.6	0.5	2.8

Source: presentation 5E and AtkinsRéalis analysis. Note: numbers may not sum due to rounding

3.4.7 Step Expenditure – Corporate

The step is defined as any forward-looking step change in the efficient level of recurrent controllable opex due to a particular event, such as changes to regulation or the method of delivering a service. We have interpreted this as an exogenous driver such as meeting any changes from regulators, or a change in external factors such as raw water quality or the impact of growth in new development areas.

Sydney Water has proposed a range of step changes as summarised in Table 3-46 below. Proposed step changes are defined by item. We identified changes driven by external requirements (exogenous) and internal business need (endogenous).

We have reviewed each of the proposed step changes to ensure that the item meets the requirements of a step change, that the timing of the expenditure is appropriate, and the level of expenditure proposed is efficient.

Table 3-46 – Proposed Step changes corporate service ($FY25M)

Year ending $FY25M	2025	2026	2027	2028	2029	2030	Total 2026 to 2030
Digitalisation	8.9	17.9	23.7	28.2	29.8	31.4	131.1
IT project opex	10.0	14.3	7.1	4.6	1.2	5.9	33.0
Additional operational headcount support for PxP	0.3	1.0	1.0	1.0	1.0	1.0	5.2
Changes in insurance premiums	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	-6.7
Changes in Fringe Benefit Taxes (FBT) expenses	0.4	0.4	0.4	0.4	0.4	0.4	1.8
Changes in advertising spend	0.1	0.3	0.5	0.4	0.4	0.4	2.0
Adjustment for Right of Use (RoU) leases	-2.3	-2.3	-2.3	-2.3	-2.5	-2.5	-11.8
Gross corporate step expenditure	16.1	30.4	29.0	31.0	28.9	35.2	154.5
Less efficiencies proposed by Sydney Water	-22.9	-23.5	-29.5	-34.2	-37.6	-45.1	-169.8
Net corporate step expenditure	**-6.9**	**6.8**	**-0.4**	**-3.1**	**-8.7**	**-9.9**	**-15.3**

Source SIR BTS spreadsheet. Note: numbers may not sum due to rounding.

In the SIR submission, step expenditure for Digitisation, IT project opex (Propex) and the People Experience Platform (PxP) have been apportioned to the water, wastewater and stormwater services. For the purposes of this review, we have addressed these areas of expenditure within Corporate and used the SIR BTS analysis approach to allocate the costs to the services in the AIR/SIR model (not within this report).

In this section we discuss the step changes proposed for Digital, property costs and 'adjustment of lease' costs. We have not reviewed expenditure less than $5M over the period as this is not considered a material step in expenditure and could be managed in the base year operating expenditure envelope.

3.4.7.1 Digital opex

We are proposing two adjustments for the upper end of the digital opex range, for digital project opex (propex) and digitisation. For Operational headcount for PxP, we are satisfied with the justification for the step change.

For propex, Sydney Water has proposed a step change in the future period of $52M and we are comfortable with the derivation of this investment. However, we have identified double counting given that there was $6.6M propex in FY24. We are therefore making a $6.6M per annum reduction as this only constitutes a partial step change. This is a reduction of $32.9M. As discussed, we have also moved all the digital expenditure to Corporate, where we believe it sits better in one area of the business. See Section 5.4.2 Opex for more information.

For digitisation, we do not believe Sydney Water has justified sufficiently the level of increases for managed and cloud services. We have reduced the managed services element from $77M to $61M and cloud services from $45M to $36M, which corresponds to a 20% reduction due to the uncertainty on both the timing and also the cost estimates.

For the lower end of the range, we are proposing Sydney Water's 5.5% (capex 2.0%, opex 3.5%) rate of digital spend as a percentage of total expenditure is maintained.

See 5.4.2 Opex in the Digital chapter for more information.

3.4.7.2 Adjustment to Right of Use Leases

The net impact of the step changes is $1.5M so no adjustments have been applied. While the water service shows an increase of $10.1M and $3.1M for wastewater, this is offset by an $11.7M reduction in the corporate service.

3.4.7.3 Insurance premiums

We note the reduction in insurance premiums as a step expenditure. We have not reviewed this item as is it is not material. Sydney Water subsequently advised us of an increase of a $4M increase in premium for 2026 although subsequent years have not been updated.

3.4.7.4 Scada and Operational controls

We have no observations on the SCADA and Ops controls. We reviewed the proposed operating step change and found these to be reasonable. We are not proposing to make any adjustment to this item.

3.4.7.5 Allocation of corporate opex

Corporate opex has been reported as a separate line item in this report. However, it will be allocated to the different services for pricing purposes.

We review the allocation of corporate capex in Section 4 below. Sydney Water's proposed allocation of corporate opex is summarised below.

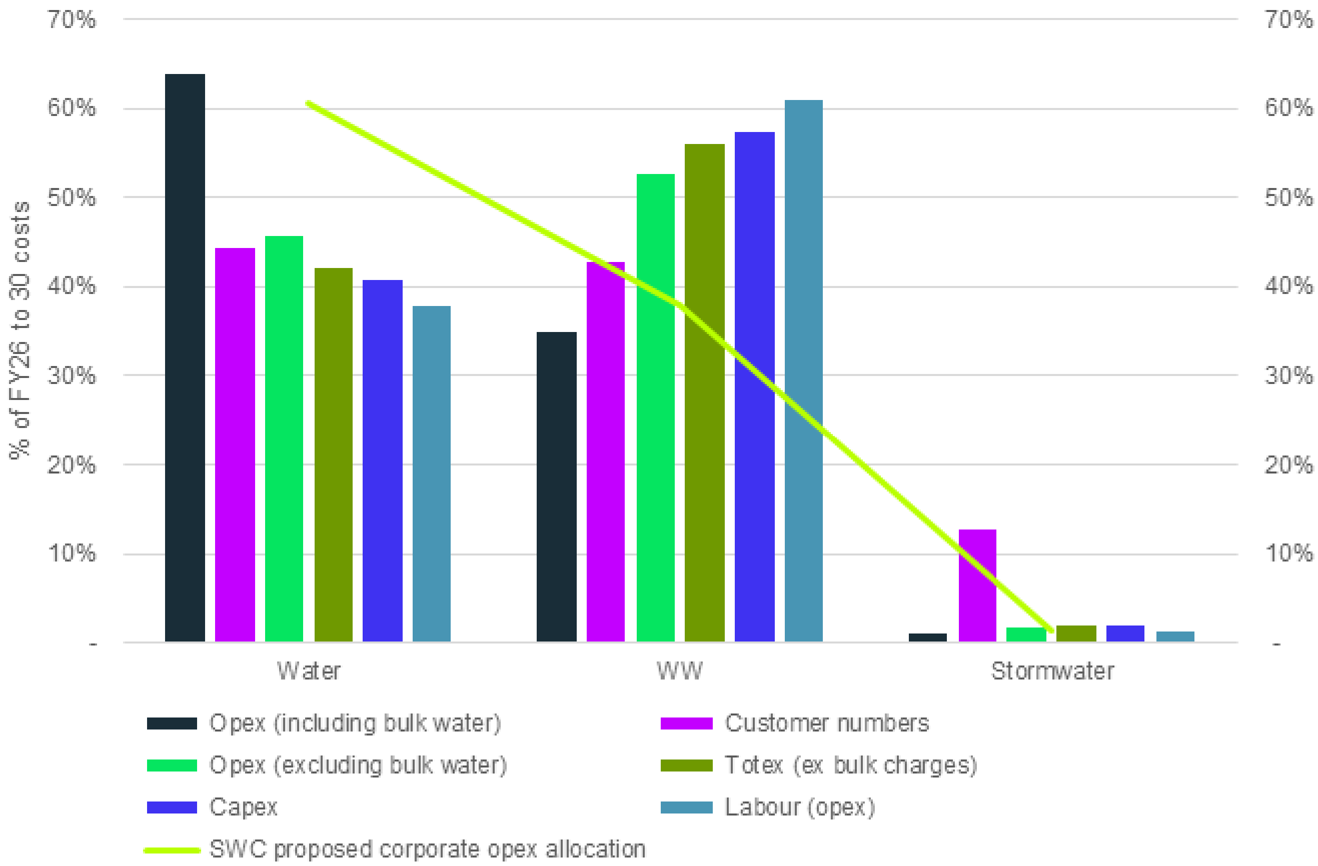
Table 3-47 – Sydney Water's proposed allocation of corporate opex

	2025	2026	2027	2028	2029	2030
Water	57%	61%	61%	61%	60%	60%
Wastewater	42%	37%	37%	38%	38%	39%
Stormwater	1%	1%	1%	1%	1%	1%

Source: Analysis of AIR/SIR

We have compared this to different allocators including labour opex (as a proxy for FTEs), customer numbers, opex and totex as summarised below.

Figure 3-35 - Proportion of costs by service



Source: Analysis of AIR/SIR

We conclude that Sydney Water's proposed allocation of corporate opex does not align well with the proportion of expenditure or customers for each service. Bulk supply costs increase the apparent proportion of expenditure for the water service but are unlikely to require significant corporate support. As such, **we have recommended allocating corporate opex in line with the proportion of proposed opex (excluding bulk supply costs) in FY26 to FY30 for each service i.e. 46% to water, 53% to wastewater and 2% to stormwater. This appears to be a more representative and causal allocator.**

3.4.7.6 AtkinsRéalis adjusted corporate step expenditure

Table 3-48 – Recommended Corporate step expenditure - upper scenario

Year ending $M 2925	2025	2026	2027	2028	2029	2030	Total 2026 to 2030
Digitalisation	13.9	20.0	24.4	28.3	30.3	32.0	135.0
IT project opex	9.2	15.9	4.6	0.8	-4.7	2.7	19.3
Additional operational headcount support for PxP	0.3	1.0	1.0	1.0	1.0	1.0	5.2
Changes in insurance premiums	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	-6.7
Changes in Fringe Benefit Taxes (FBT) expenses	0.4	0.4	0.4	0.4	0.4	0.4	1.8
Changes in advertising spend	0.1	0.3	0.5	0.4	0.4	0.4	2.0
Adjustment for Right of Use (RoU) leases	-2.3	-2.3	-2.3	-2.3	-2.5	-2.5	-11.8
Gross corporate step expenditure	20.2	34.0	27.2	27.3	23.5	32.6	144.7
Less efficiencies proposed by SWC	-28.9	-26.4	-27.6	-30.0	-30.6	-41.7	-156.3
Net corporate step expenditure	-8.6	7.7	-0.4	-2.8	-7.1	-9.1	-11.7

Source: AtkinsRéalis analysis. Note: numbers may not sum due to rounding

Table 3-49 – Recommended Corporate step expenditure - lower scenario

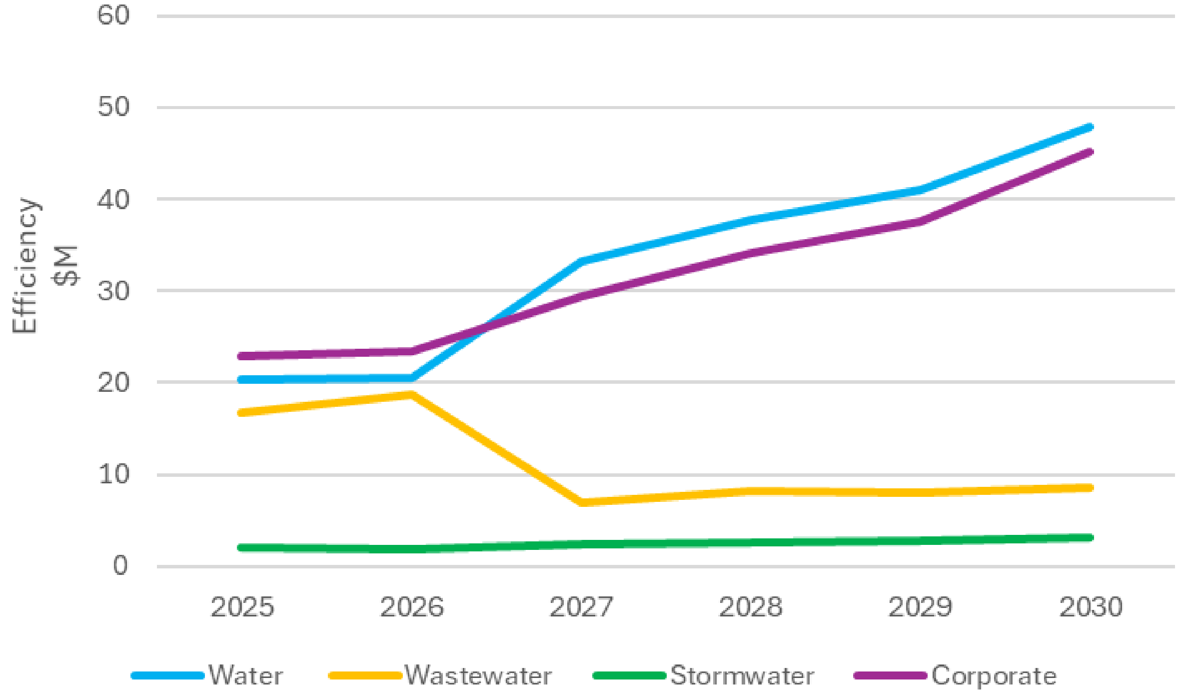
Year ending $M 2925	2025	2026	2027	2028	2029	2030	Total 2026 to 2030
Digitalisation + IT project opex	23.1	28.8	18.8	16.2	11.2	19.2	94.3
Additional operational headcount support for PxP	0.3	1.0	1.0	1.0	1.0	1.0	5.2
Changes in insurance premiums	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	-6.7
Changes in Fringe Benefit Taxes (FBT) expenses	0.4	0.4	0.4	0.4	0.4	0.4	1.8
Changes in advertising spend	0.1	0.3	0.5	0.4	0.4	0.4	2.0
Adjustment for Right of Use (RoU) leases	-2.3	-2.3	-2.3	-2.3	-2.5	-2.5	-11.8
Gross corporate step expenditure	20.2	27.0	17.0	14.3	9.1	17.2	84.6
Less efficiencies proposed by SWC	-28.9	-20.9	-17.3	-15.8	-11.9	-22.0	-87.8
Net corporate step expenditure	-8.6	6.1	-0.2	-1.5	-2.8	-4.8	-3.2

Source: AtkinsRéalis analysis. Note: numbers may not sum due to rounding

3.4.8 Step Expenditure – Efficiencies

Sydney Water is proposing step efficiencies applied to the proposed step increases discussed in Section 3.4.5 to 3.4.7. These efficiencies total $413M over the five-year period 2026 to 2030. These have been mapped to the water, wastewater, stormwater and corporate services as shown on Figure 3-36. Year 2025 is also shown for completeness.

Figure 3-36 - Proposed step efficiencies 2025 to 2030 by service area



Source: SIR BTS spreadsheet

The forecasts show significant efficiency forecasts for the water service and corporate, although the wastewater service shows a reducing trend in efficiencies. This starts from a base significantly above zero which suggests that many of these efficiencies have been embedded into the business from the current period.

The efficiencies are forecast from several initiatives from Presentation 5F, summarised in Table 3-50. These include efficiencies from approved programs and new commitments for efficiencies from the step program.

Table 3-50 – Proposed step efficiencies by program

Year ending $FY25M	2025	2026	2027	2028	2029	2030	Total 2026 to 2030
Digital customer platform		0.3	0.6	0.7	0.8	1.0	3.4
Flow program		7.6	8.1	12.3	12.3	12.3	52.6
Optimise digital infrastructure		0.7	1.3	2.2	2.8	2.7	9.7
People's experience program		0.7	0.8	0.8	0.8	0.8	3.9
Subtotal approved programs	*No details*	9.3	10.8	16.0	16.7	16.8	69.6
Smart metering		0.8	1.3	1.8	2.2	2.7	8.8
Operating efficiency (chemicals and maintenance)		17.3	15.2	15.1	15.0	15.0	77.6
Continual improvement (operations, procurement and contracting)		37.3	44.8	49.6	55.4	70.2	257.3
Total step efficiency	62.0	64.7	72.1	82.5	89.3	104.7	413.3

Source: Presentation 5F. Note: numbers may not sum due to rounding.

The forecast efficiencies include those achieved and banked in the current period and 2025. For example, efficiencies of $62M p.a. are forecast to be achieved by 2025. This increases to $104.7M p.a. by 2030. These include the efficiencies from the 'approved' programs which have been implemented through or during part of the current period; for example, the digital customer platform and the PxP program.

The 'Flow' program is the largest efficiency driver from the 'approved' programs and was commissioned in the current period. This derives efficiencies from automation of the scheduling and despatch activities including reduced travel time and an increase in first time fixes. These automated processes also bring more effective resource planning and preventive maintenance planning. There are clear activities being targeted for efficiencies.

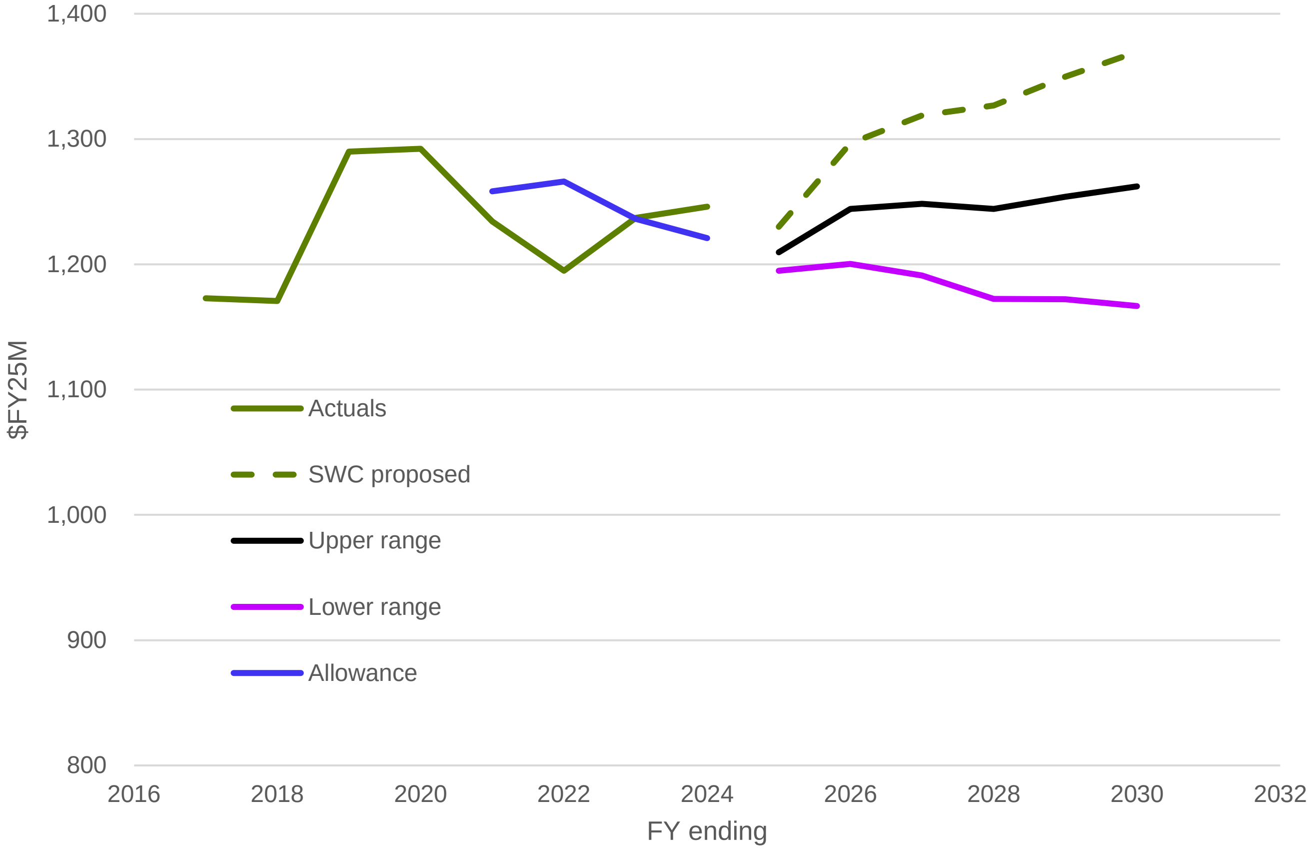
Where we have made adjustments to the scope and timing of proposed step expenditure in the service areas, we have adjusted the value of proposed efficiencies pro rata to the total expenditure recommended compared with the Sydney Water proposed expenditure.

3.5 Recommended expenditure scenarios

The recommended core controllable opex based on the adjustments described above is presented in graphical form in Figure 3-37 below and by service in Table 3-51.

The upper range represents an average core opex of $1251M p.a. (in FY26-30) or 6% below Sydney Water's proposal. The lower range makes an average core opex of $1181M p.a. or 11% lower than the proposal.

Figure 3-37 – Total core controllable opex expenditure ranges



Source: AtkinsRéalis analysis of AIR/SIR and the 2020 AIR/SIR

Note: these costs do not include bulk supply costs as these will be set as part of the WaterNSW Greater Sydney Determination.

Year 2025

We included year 2025 in the base, trend, step analysis and concluded that efficient expenditure was in the range $1255M for the upper scenario and $1241M in the lower scenario, including non-controllable costs except for bulk water. This compares with the 2024 base year of $1245M.

Table 3-51 – Opex ranges by service – controllable costs

Year ending June ($FY25M)	2025	2026	2027	2028	2029	2030
Sydney Water Proposal	1230	1297	1319	1327	1350	1370
Wastewater	525	545	565	571	591	602
Water	471	496	501	501	506	511
Stormwater	14	19	19	19	19	19
Corporate	220	238	235	236	234	238
Upper range	1210	1244	1248	1244	1254	1262
Wastewater	519	525	536	535	545	552
Water	461	471	471	471	473	474
Stormwater	15	17	17	17	17	17
Corporate	214	231	224	222	218	218
Lower range	1195	1200	1191	1177	1172	1167
Wastewater	512	504	506	496	501	500
Water	457	456	452	447	444	443
Stormwater	15	16	16	16	16	16
Corporate	210	224	216	213	212	208

Source: "SIR Opex 2 bts" and AtkinsRéalis analysis.

Note: These are controllable costs and exclude expenditure defined as non-controllable in Table 3-3.

We also present below a summary of the opex ranges by service including non-controllable expenditure. Non-controllable costs have been incorporated in these ranges at the level proposed by Sydney Water.

Table 3-52 – Opex ranges by service –controllable and non-controllable costs (except for bulk supply)

Year ending June ($FY25M)	2025	2026	2027	2028	2029	2030
Sydney Water Proposal	1276	1348	1373	1385	1411	1437
Wastewater	553	574	595	603	625	639
Water	488	517	524	527	533	541
Stormwater	15	19	19	19	20	20
Corporate	220	238	235	236	234	238
Upper range	1255	1296	1303	1303	1316	1329
Wastewater	548	554	567	567	579	589
Water	479	493	495	497	500	504
Stormwater	16	18	18	18	18	18
Corporate	214	231	224	222	218	218
Lower range	1241	1252	1246	1231	1234	1235
Wastewater	541	533	537	528	535	537
Water	474	478	476	473	472	473
Stormwater	16	17	17	17	17	17
Corporate	210	224	216	213	211	208

Source: “SIR Opex 2 bts” and AtkinsRéalis analysis.

Note: Non-controllable costs are included at the level proposed by Sydney Water

3.5.1 Response to the draft report

In response to our draft report Sydney Water raised a number of concerns related to the approach taken to assess the impacts of growth on opex. Sydney Water asserted that the use of connections is common practice, that it faces a range of indirect costs such as asset management, safety and customer service and billing and that offsetting trend growth via assumed efficiencies in real price effects is not appropriate in a system with a high share of greenfield growth.

Our view

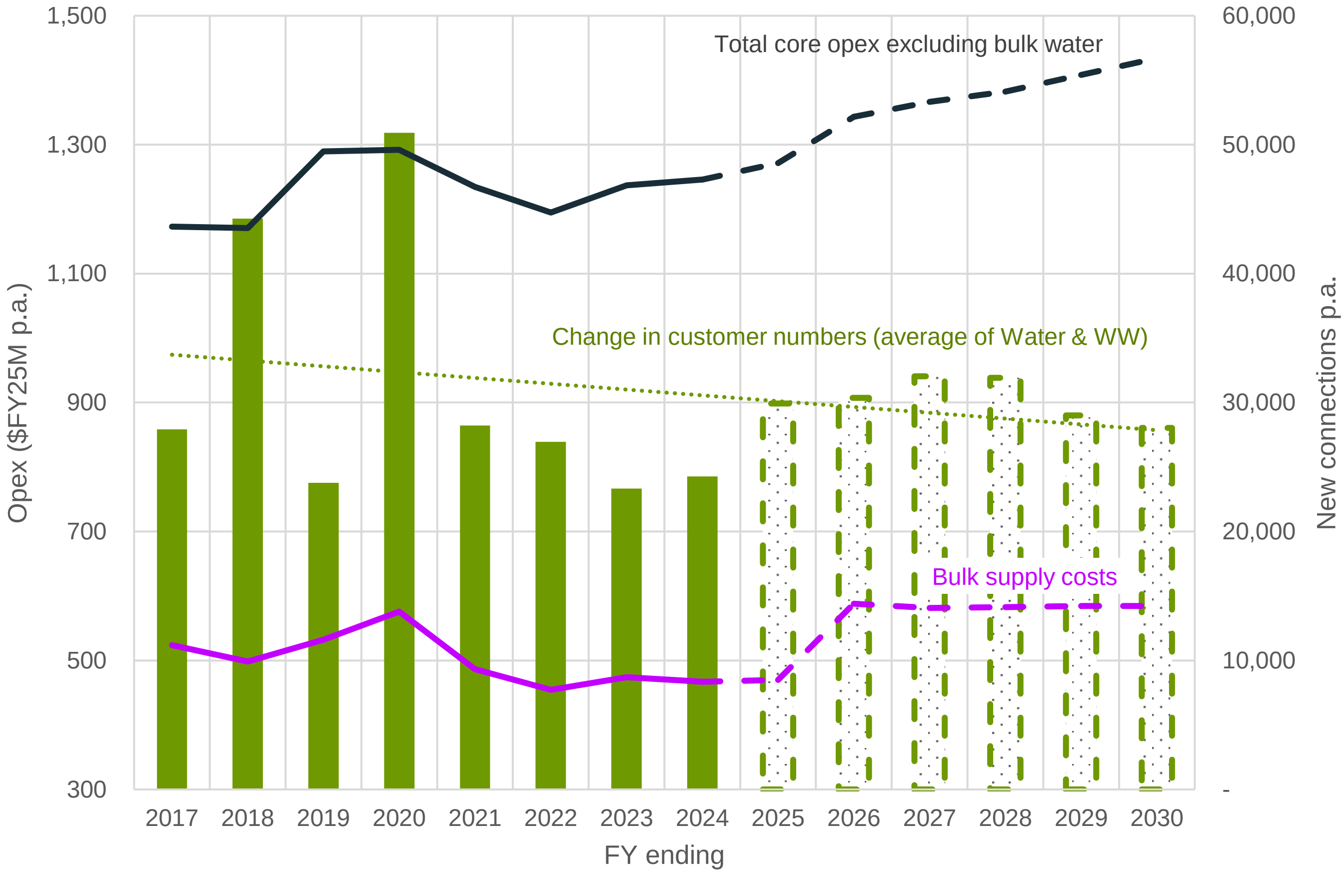
We understand Sydney Water’s concerns and acknowledge a number of them in Section 3.4.3 above.

The main challenge we have had in recommending the higher level of opex driven by growth is that Sydney Water has not demonstrated the relationship between the total base opex and growth in connections. A significant component of opex is, by definition, largely fixed and independent of the growth in new connections. We therefore looked at the activities within the business where costs are variable and driven by volume or loading. These areas included bulk water, electricity costs for treatment and pumping, and customer service. We found that bulk supplies are generally flat because of leakage control, the impact of the metering program (finding leaks on customers’ premises) and water efficiency. This enables Sydney Water to serve an increasing population while limiting water purchases, treatment and distribution costs.

Sydney Water operates an effective customer service management team where we concluded that the marginal increase in staffing proposed to deal with growth could be absorbed within the current staffing and vacancies.

We were mindful that Sydney Water managed a similar growth in new connections through the current period without any visible increase in expenditure as summarised below.

Figure 3-38 – Comparison of Sydney Water's proposed and historical customer connections and opex



Source: AtkinsRéalis analysis of AIR/SIR and the 2020 AIR/SIR

We consider it would be useful for Sydney Water to investigate the relationship between growth in new connections and the additional expenditure this is likely to drive. Without such tested relationships, it is difficult to confirm the direct relationship between increase in new connections and base year expenditure.

4. Detailed review of capital expenditure

4.1 Summary of findings

This chapter presents a review of Sydney Water's proposed capex.

Capex has been on a significant upward trajectory since FY21, with Sydney Water significantly overspending the allowance in the later years of the 2020 Determination period. The proposed capex program represents a more than doubling of the rate of expenditure in the 2020 Determination period. This percentage increase is particularly high for the water service for which Sydney Water proposes a more than trebling of expenditure. Growth capex makes up the majority (61%) of proposed capex and also represents the biggest area of increase.

Sydney Water has applied two layers of adjustments in deriving its capital program: individual program adjustments and a top down portfolio-wide adjustment. These adjustments have complicated the expenditure review in that the amount of expenditure proposed doesn't always correspond to a fixed or firm scope.

We have reviewed 25 projects/programs chosen to provide reasonable coverage of service, driver and asset category. Some of the key findings are summarised below.

Growth

Sydney Water has spent an average of $692M p.a. in the current Determination period (FY21 to FY24) on servicing growth and is proposing a significant increase to an average of $2,005M p.a., i.e. a near trebling of the current level of expenditure.

Overall we confirmed that the strategy to manage growth has been adequately optioneered, with constraints on the SWSOOS and NSOOS transfers strongly influencing the wastewater management strategy, and the need for new rainfall independent supplies driving the nature of the water strategy. However, although the strategies appear to be appropriate, the timing of need is uncertain and some of the schemes may not need investment in Period 1. Sydney Water has recognised this in its analysis by applying some 'top down' adjustments to the costs, but we consider that these adjustments could be larger for the reasons summarised below.

Whilst the SDP network expansion (part of the Resilient and Reliable Water Supply - RRWS) will be required as part of the longer-term water strategy for Sydney, the case for carrying out the work within the 2025-30 period is weak and it appears that the work could be deferred without a significant increase in water supply risk to the city. We have recommended a scope adjustment of $828M (pre-efficiency) associated with this deferral. If a lower growth or more balanced long term risk scenario is used then some deferral of the Purified Recycled Water (PRW) plants that are proposed within the RRWS could additionally be deferred, although the cost impact of this on Period 1 is relatively modest ($47M).

For Aerotropolis Mamre Road, we have incorporated more recent, lower estimates of costs by Sydney Water for the FY26-30 period, reducing the estimate by $514M. There may also be some potential for land purchase prices to be lower than currently assumed for the scheme outside of the Mamre Road element. Because much of the cost for the non-Mamre Road elements has now been deferred out of Period 1, then the estimated impact of this on our lower bound scenario is only $30M.

For other growth capex we have carried out an 'in the round' assessment of potential scope deferral, examining schemes where there is the potential to defer scope entirely beyond Period 1, and the likely scope impact on remaining schemes if Sydney Water adopts SHSF forecasts (rather than its 'high confidence' growth forecasts) in the shorter term. We have also examined the potential for delivery efficiencies beyond those assumed in the top down 'portfolio' level adjustment. We have also considered the implications of adopting a higher risk attitude to growth, where schemes are effectively deferred by an additional 12 months beyond the adjustments referred to above. This shows that growth capex is very sensitive to the timing of growth, and would result in a further $1,479M cost reduction in Period 1 if this scenario is adopted.

Renewals

Sydney Water's price proposal incorporates a 55% real terms increase in renewals capex, amounting to a total renewals program of $5,508M. Wastewater renewals capex is the largest component of both historical and proposed expenditure followed by water. Stormwater renewals are projected to increase in the next period.

Whilst in its explanation for the increase Sydney Water refers to assets coming to the end of their lives, in reality the business expects the program to reduce risk and improve performance for most asset classes. This might not be an unreasonable aim if the asset risk is unacceptably high and customers support reducing it. However, Sydney Water has not set out justifications in these terms. Instead, it has defined a program by giving all assets a risk score and then using an unclear decision criterion to determine how many of them should be replaced.

For wastewater, the increase in expenditure is mainly associated with the WRRF renewals program, critical sewers such as the NSOOS and the wastewater network more generally.

- For WRRFs, we consider that the business has not justified that current levels of asset risk are too high and that customers should pay to increase expenditure and reduce risk. Sydney Water's own analysis suggests that maintaining expenditure at historical levels would lead to stable risk levels. It is also likely to be challenging to deliver significant upgrades on live plants.
- We also consider that the justification for the increase in wastewater pumping station renewals has not been clearly and robustly made. The business's own projections for network facilities (of which pumping stations are an important part) suggests that the backlog has been reducing and will continue to do so under historical levels of expenditure.
- The increase in expenditure on critical sewers is driven by increased expenditure on the NSOOS program and other critical sewers such as the SWSOOS and BOOS. We note how challenging it is to deliver the works in critical sewers and have applied an adjustment to take this into account.

For water, the increase in expenditure is mainly associated with the pretreatment program but also with water metering, WFP renewals and water network facilities such as reservoirs and pumping stations.

- We found that whilst there are potential benefits for future adverse water quality events resulting from the largest of the proposed pretreatment projects (Prospect), the project does not fall into the 'very well justified, clearly has to happen now' category. The plant and business have already demonstrated that they have survived an adverse event without the need for boil water notices. This is a high capex (and opex) project and we suspect the economic case is more marginal than presented.
- We consider that a staged approach to roll out of the pretreatment program would be appropriate taking account of the resource constraints which have affected the delivery of the Nepean upgrades and of the opportunity to learn from each project. This appears to be already partly reflected in the SIR through the portfolio adjustments Sydney Water has applied.   We have made a further adjustment to reflect this assumption more explicitly.
- We consider it likely that the smart metering program will be cost-beneficial for customers over the medium term and have included it in the Upper range of expenditure. Given that the smart metering element is not essential and could therefore be deferred we have identified it as a potential service level adjustment.
- We consider that Sydney Water has not made the case that WFP and reservoir asset risk is too high and customers should pay to reduce it through increased renewals. Sydney Water's projections suggest that reservoir risk levels will improve slightly even if historical levels of expenditure are maintained.

For stormwater, Sydney Water has not justified why customers should pay more to reduce the level of risks facing its assets which it already classifies as in ‘green’ condition. We therefore consider that the business has not justified the proposed increase in expenditure.

Corporate capex

Corporate capex is largely made up of digital and property investments. Digital expenditure is covered in Chapter 5.

For property capex, Sydney Water is proposing a step change in both capex and opex expenditure. The capex increases are driven by a range of factors which we broadly concur with based on evidence from condition and compliance assessments alongside a more rigid application of existing standards, new standards and/or increased scrutiny around bushfire, workplace standards, biosecurity, electrical safety, and security. We have made a number of adjustments to reflect the latest view of likely expenditure.

Compliance

The compliance driven expenditure consists of three programs: Prospect pretreatment (discussed alongside other pretreatment investments in ‘renewals’ above), wet weather overflow abatement and wet weather surcharge.

We reviewed the wet weather overflow abatement program. Our view is that this is a well-tailored program which Sydney Water has good experience of delivering and which is likely to deliver material benefits to the environment and water users. It is also now a stated requirement in the EPL. We have therefore included it in the Upper range of costs but made an adjustment in the ‘lower’ range for as lower expenditure might be possible with a change in operating environment.

Improvements

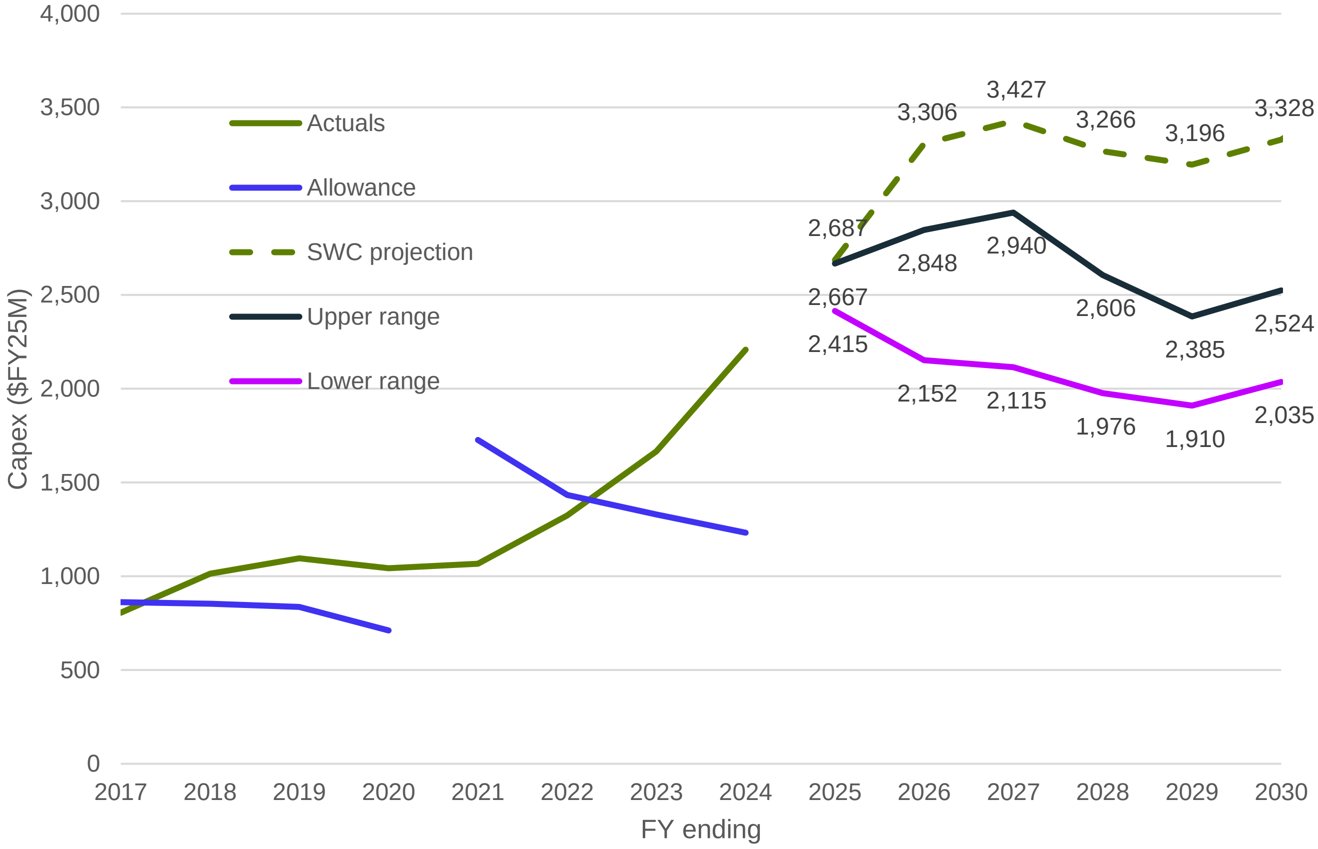
We have not reviewed proposed ‘improvements’ expenditure in any detail given that it makes up 0.5% of the proposed capital program.

Recommended expenditure

For growth capex, we have retained Sydney Water’s portfolio adjustment effect as it assumes a level of efficiency that appears to be in line with its procurement proposals. For other driver capex our view is that efficiency has not clearly been built into the ranges set out above, especially given that many of our recommended ranges are based on historical expenditure. We have therefore applied a continuing efficiency challenge of 0.7% p.a. (cumulating) to non-growth capex.

The recommended expenditure is presented in graphical form below. The upper range represents a total capex of $13,303M (in FY26-30) or 19% below Sydney Water’s proposal. The lower range makes a total of $10,189M or 38% lower than the proposal.

Figure 4-1 – Total capex expenditure ranges

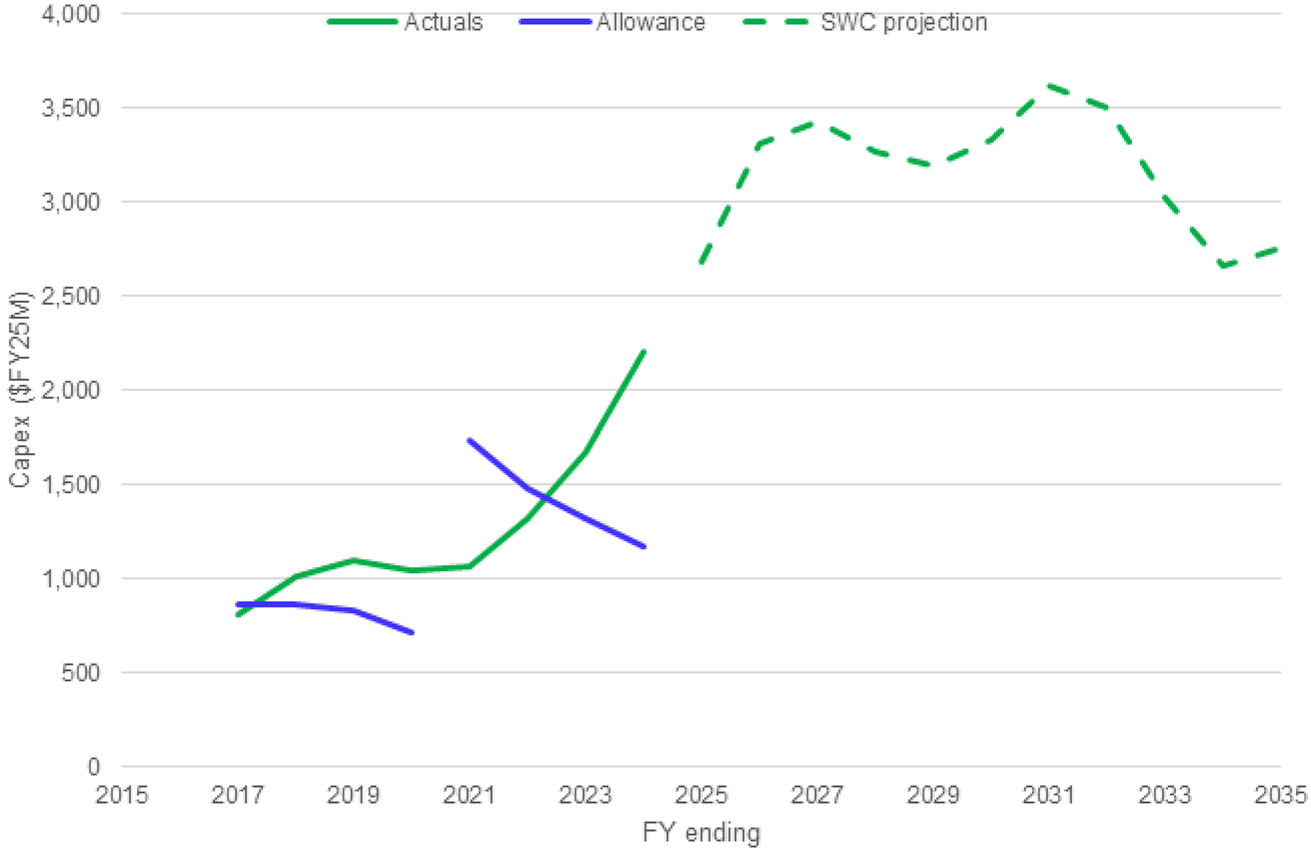


Source: AtkinsRéalis analysis of AIR/SIR and the 2020 AIR/SIR

4.2 Context: historical capex

Capex has been on a significant upward trajectory since FY21. As a result Sydney Water has overspent the 2020 Determination capex allowance by 10% or $544M from FY21 to FY24. It underspent the allowance in FY21 and FY22 but the upwards trend in expenditure resulted in significant overspend in the later years rising to $976M in FY24 as can be seen graphically below.

Figure 4-2 – Historical and proposed total capex



Source: Analysis of AIR/SIR

The largest expenditure variance related to the wastewater service albeit the overspend in corporate capex was more significant in % terms.

Table 4-1 – Average capex variance ($FY25M p.a.)

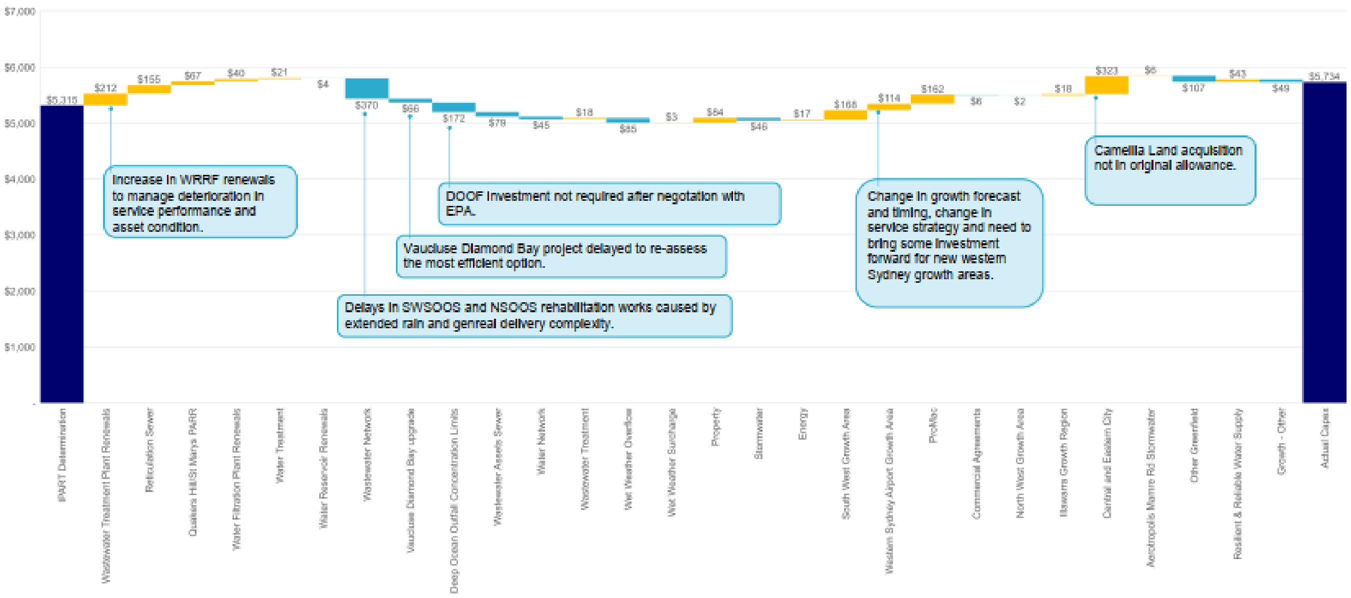
Category	FY21 to 24 allowance	FY21 to 24 average (actuals)	Variance $M p.a.	
Wastewater	927	975	48	5%
Corporate	124	166	43	34%
Water	326	369	43	13%
Stormwater	54	57	2	4%
Total	**1,431**	**1,567**	**136**	**10%**

Source: Analysis of AIR/SIR

The scope of work of this assignment does not include an ex-post review of capex so we have not examined variance in detail. We note that Sydney Water has provided a number of explanations for the variance including the circumstances in place at the time of its 2019 submission (including the extent and timing of the new Aerotropolis region and the risk sharing applied to its growth program), the initial disruption caused by drought and bushfires and new delivery arrangements in place which are enabling this level of capital delivery.

It has also provided a "waterfall" assessment of the variances at a program/project level (copied below) which highlight the effects of delays in the Southwestern Suburbs Ocean Outfall Sewer (SWSOOS), Northern Suburbs Ocean Outfall Sewer (NSOOS) and the Vaucluse Diamond Bay project and successful negotiations on the Deep Ocean Outfall (DOOF) program offset by higher expenditure than expected on Carmella Land, WRRF renewals and growth.

Figure 4-3 – Sydney Water's explanation of 2020 Determination period capex variance



Source: Sydney Water presentation 2G

4.3 Overview of proposed program

4.3.1 Capex by service

The business's proposed capex program represents a more than doubling of the rate of expenditure in the 2020 Determination period, with total proposed capex of $15,523M in FY26 to FY30. The increase is particularly focused on the water service with a more than trebling of expenditure, well above any historical levels, but there is also a significant increase in wastewater capex.

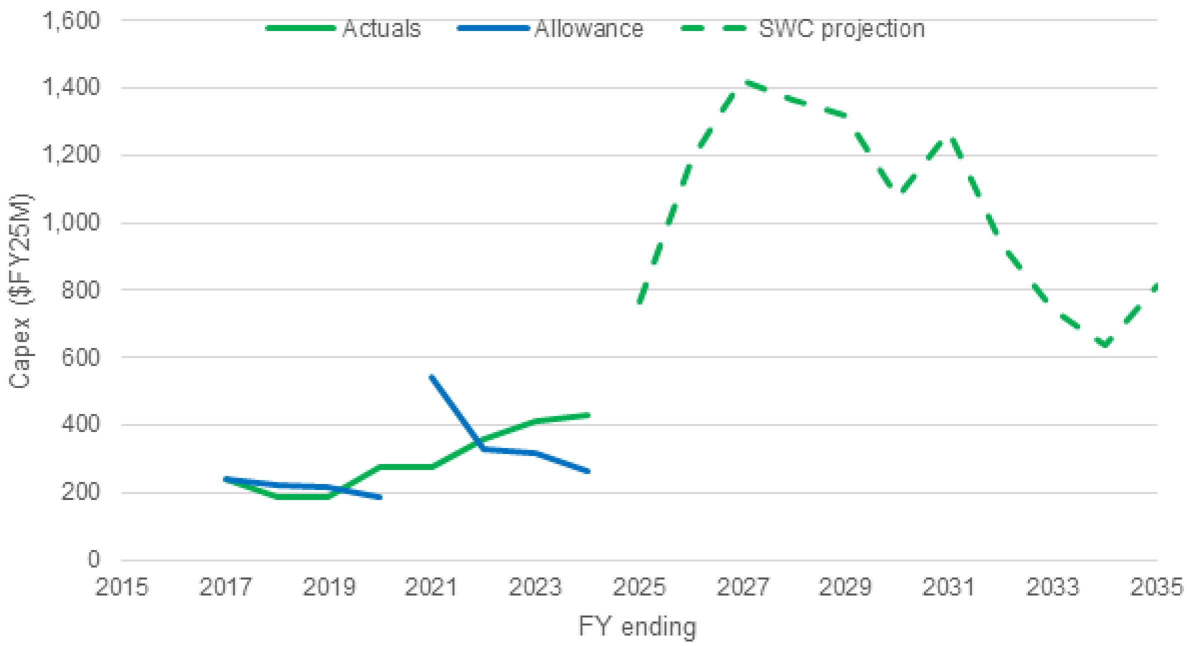
These changes are summarised in table and graphical form below.

Table 4-2 – Comparison of historical and projected capex by service ($FY25M p.a.)

Category	FY21 to 24 average (actuals)	FY24 actuals	FY25 forecast	FY26-30 annual average projection	Difference from FY21 to 24 actuals	
Water	369	415	765	1,273	905	245%
Wastewater	975	1,535	1,670	1,789	813	83%
Corporate	166	150	207	189	23	14%
Stormwater	57	45	47	53	(3)	(6%)
Total	**1,567**	**2,144**	**2,687**	**3,305**	**1,738**	**111%**

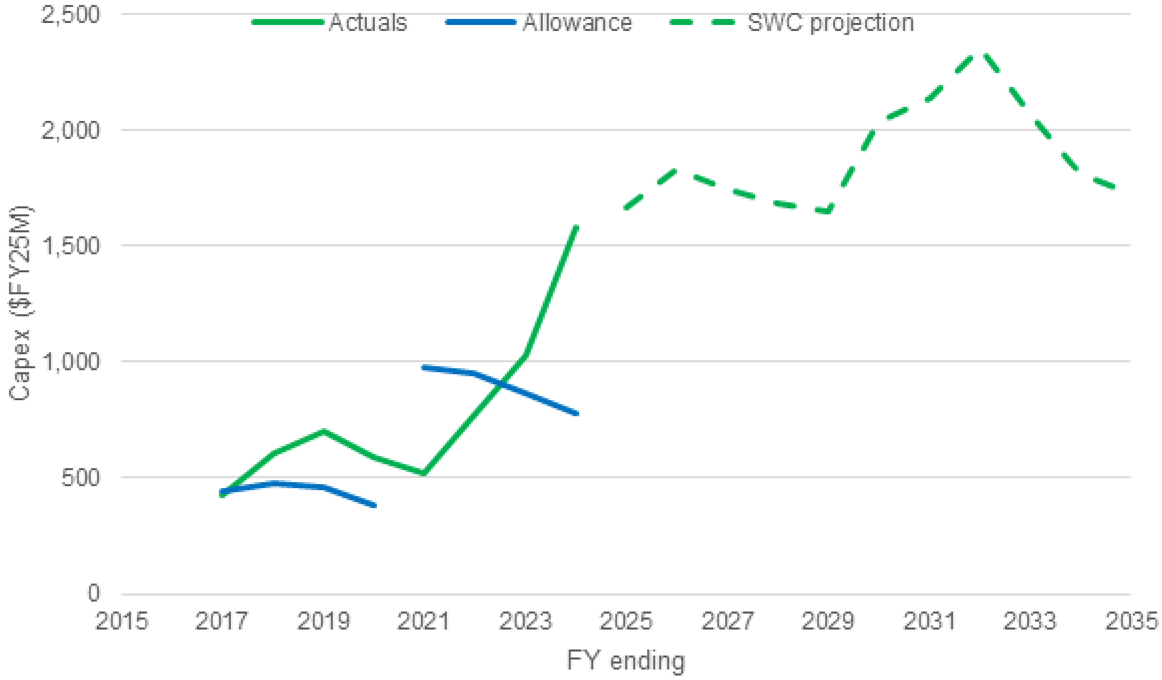
Source: Analysis of AIR/SIR

Figure 4-4 – Historical and proposed water capex



Source: Analysis of AIR/SIR

Figure 4-5 – Historical and proposed wastewater capex

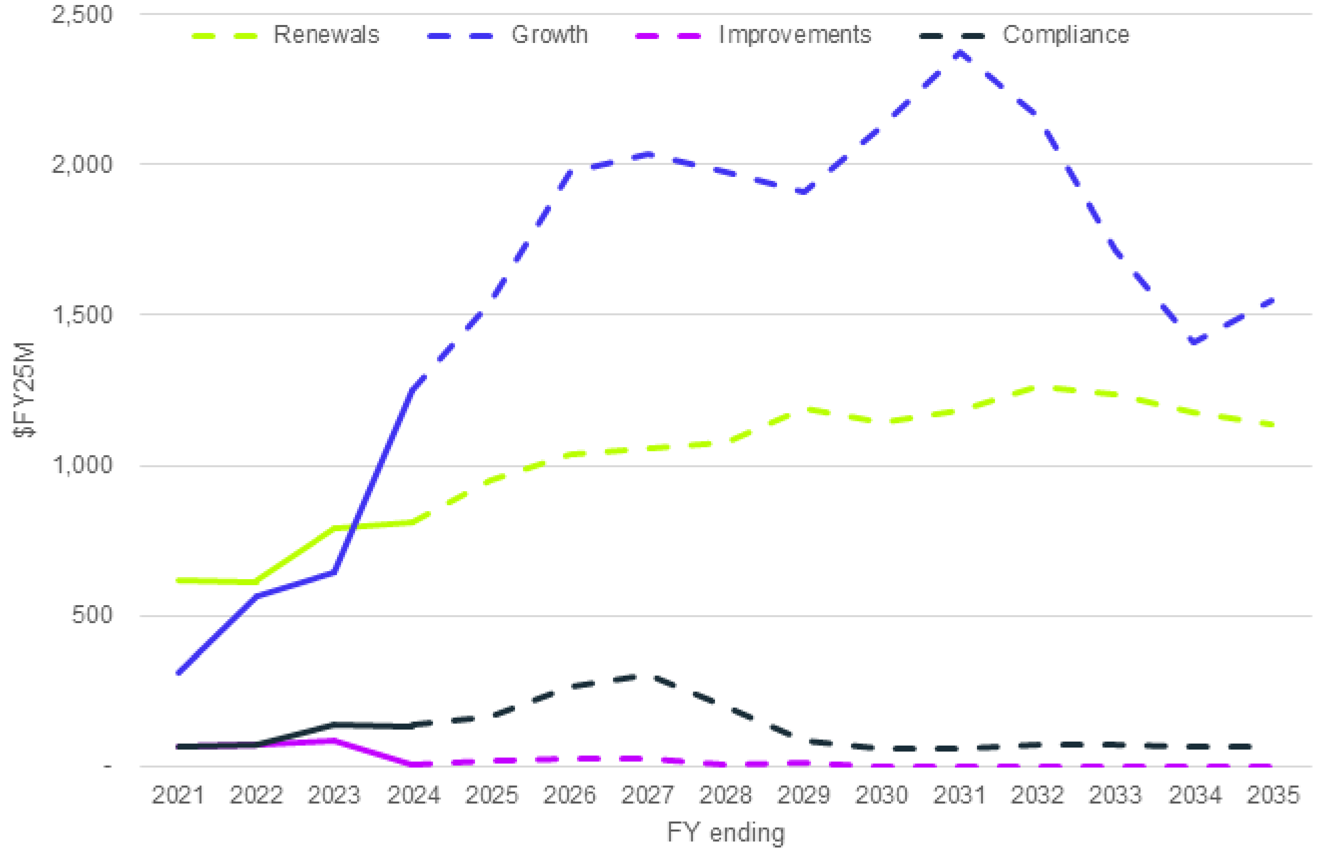


Source: Analysis of AIR/SIR

4.3.2 Proposed expenditure by driver

The proposed increase is particularly focused on growth, as seen below, with rises also projected for all other drivers (except 'improvements'). Renewals make up the second biggest cause of the rise, contributing $390M p.a. or 22% of the proposed increase.

Figure 4-6 – Historical and proposed capex by driver



Source: Analysis of AIR/SIR

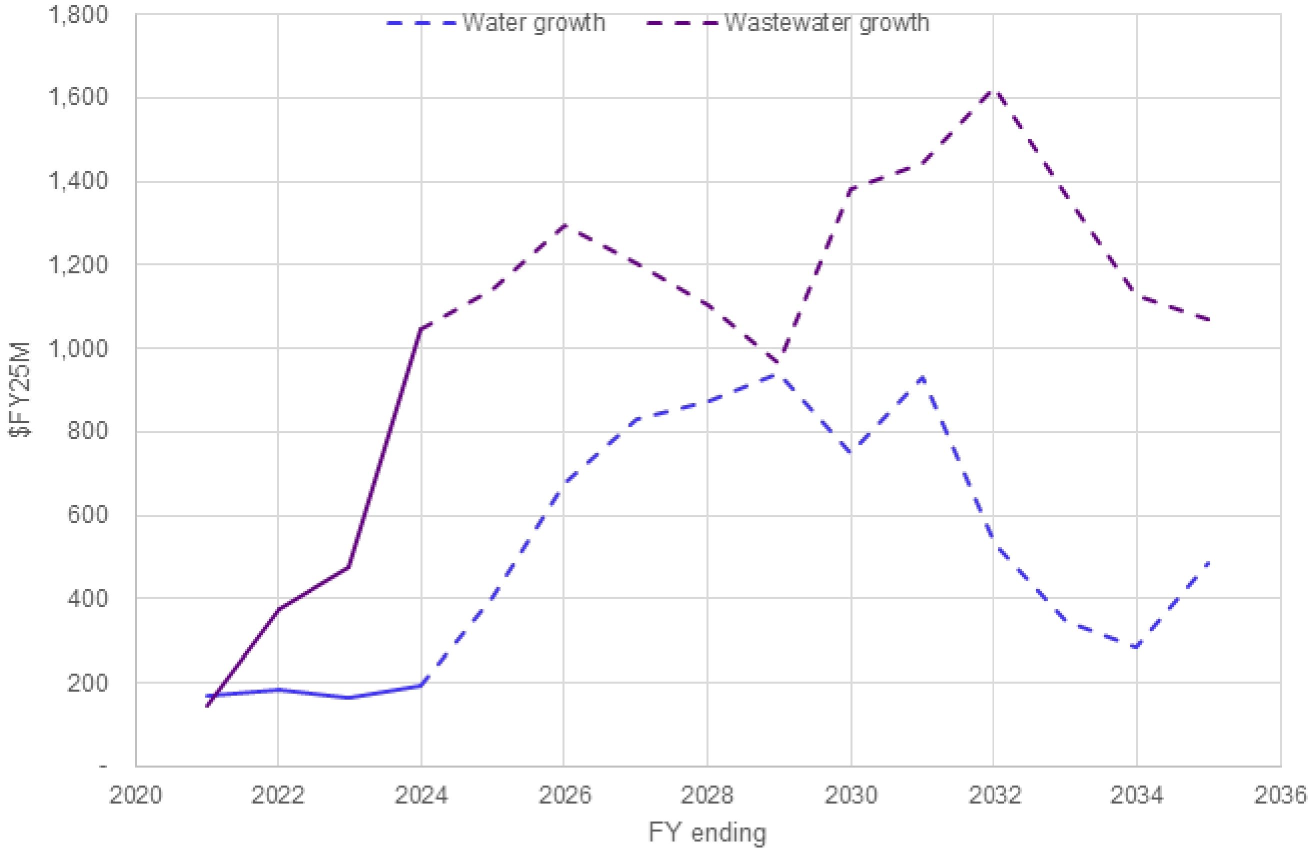
Table 4-3 – Comparison of historical and projected capex by driver ($FY25M p.a.)

Category	FY21 to 24 average (actuals)	FY24 actuals	FY25 forecast	FY26-30 projection	Difference from FY21 to 24 actuals	
Growth	692	1,247	1,545	2,005	1,313	190%
Renewals	712	814	952	1,102	390	55%
Compliance	105	140	169	184	79	75%
Improvements	58	8	22	15	(43)	(74%)
Total	**1,567**	**2,209**	**2,687**	**3,305**	**1,738**	**111%**

Source: Analysis of AIR/SIR

The proposed increase in growth capex is across water and wastewater services with only $3M of growth expenditure projected for stormwater.

Figure 4-7 – Historical and proposed water and wastewater growth capex



Source: Analysis of AIR/SIR

4.3.3 Project, Program and Portfolio cost adjustments

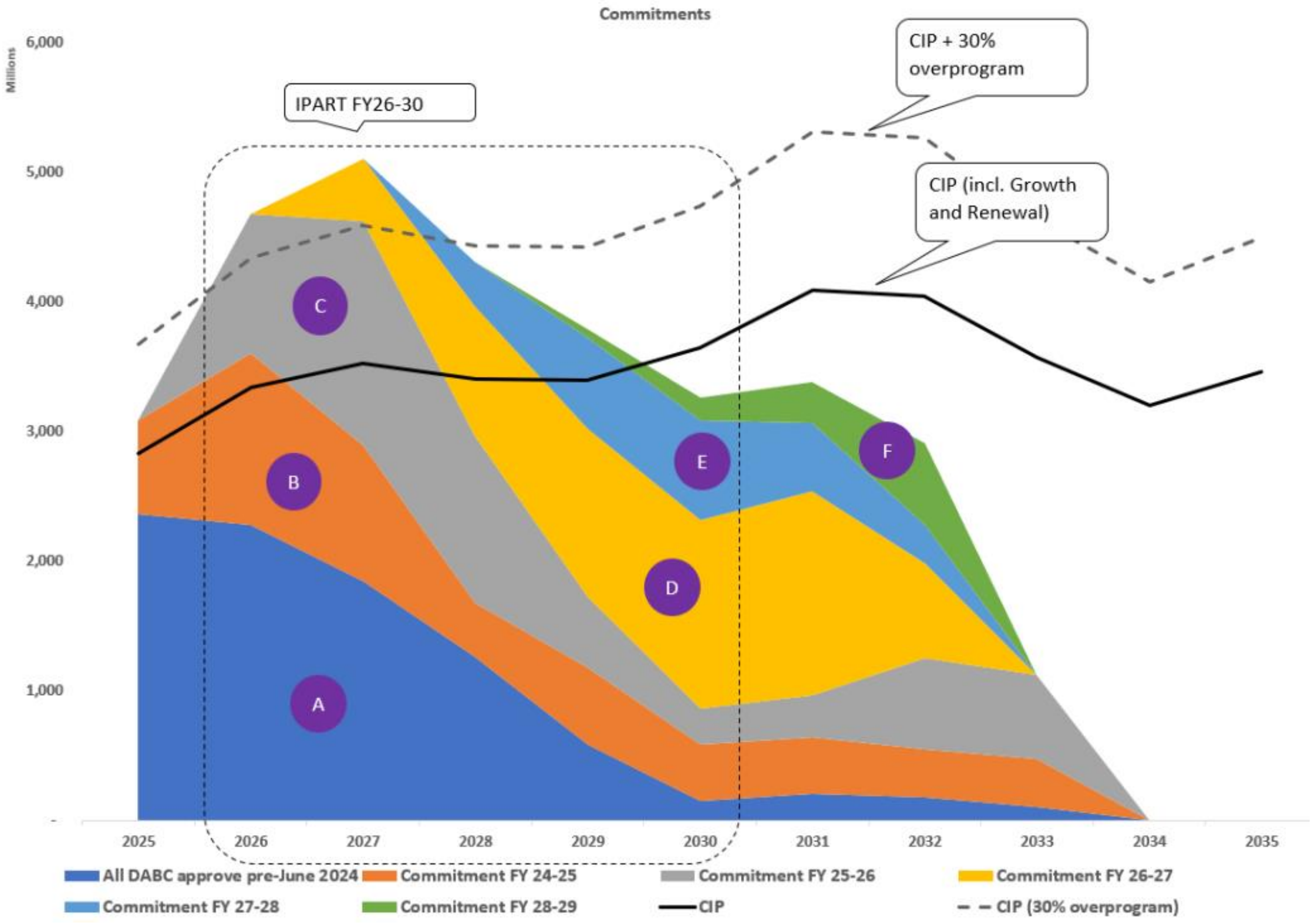
The price proposal sets out three layers of adjustments applied by the business in deriving its capital program (summarised in Figure 4-8):

1. **Individual project/scheme adjustments.**
   - Sydney Water states that this involved an efficiency review, testing each investment program and initiative for prudent and efficiency *"while assessing and managing impact to risk and performance*".
   - This resulted in a reduction of nearly 38% from a 10-year bottom-up build of just over $50Bn down to $33.5Bn across the infrastructure portfolio.
2. **A 'top down' Program level adjustment.**
   - For Growth Areas Sydney Water has qualitatively assessed the level of maturity of the projects and schemes contained in each Area (SWAGA, NWAGA, GMAC etc) and applied a program level deferral, moving cost out from Period 1 into Period 2. This ranges from 16% to 31% of cost, depending on Area.
   - **It should be noted that this adjustment has been applied across all projects within an Area, and has been done based on cost deferral, without identifying the scope that should be deferred as a result of the adjustment.**
3. **A 'top down' Portfolio-wide delivery cost adjustment**
   - A downward adjustment of $1,459M or 8% has then been applied to all FY26 to 35 capex ($2,339M or 7% across the 10-year portfolio) "*consider*[ing] *that a relatively large component of our 10-year investment program is still within planning and business case development stages. Future efficiencies, including by updating servicing strategies and assessing options, should assist us in achieving this efficiency."*

Figure 4-8 – Stages of adjustments applied by Sydney Water to its capital program

The resulting profile of expenditure has been compared by the business to its assessed infrastructure ‘commitments’ as summarised below.

Figure 4-9 – Sydney Water’s comparison of its capital program to its commitments



Source: Sydney Water presentation 2G

The ‘top down’ Program level adjustments that represent scope deferral from Period 1 (2026-2030) into Period 2 (2031-2035) are described as single adjustment for each growth area in the Infrastructure Capital Investment Overview. They were applied before project entries have been added to the SIR.

Portfolio adjustments are shown in the SIR as negative adjustments, and have only been applied to water and wastewater growth and renewals expenditure[22]. They have not been applied to other drivers, stormwater or corporate capex.

Table 4-4 – Portfolio adjustments applied

Year ending June ($FY25M)	2025	2026	2027	2028	2029	2030	Total 2026 to 2030
Water growth	31	100	121	105	54	91	**472**
Water renewals	13	16	22	34	34	46	**152**
Total water	44	116	143	140	88	137	**624**
Water growth %	7%	13%	13%	11%	5%	11%	**10%**
Water renewals %	5%	5%	6%	9%	9%	12%	**8%**
Total water %	5%	9%	9%	9%	6%	11%	**9%**
Wastewater growth	125	154	144	94	58	112	**562**
Wastewater renewals	31	51	63	53	34	68	**270**
Total wastewater	156	205	207	147	92	180	**832**
Wastewater growth %	10%	11%	11%	8%	6%	8%	**9%**
Wastewater renewals %	7%	10%	13%	10%	5%	10%	**9%**
Total wastewater %	9%	10%	11%	8%	5%	8%	**9%**
Grand total	**200**	**321**	**351**	**287**	**180**	**317**	**1,456**
Grand total (% of all capex)	**7%**	**9%**	**9%**	**8%**	**5%**	**9%**	**8%**

Source: analysis of "SIR Capex 2a"

The Portfolio adjustments have also been applied as a top-level adjustment rather than to specific projects, programs or initiatives.

These adjustments complicate the expenditure review. It means that the amount of expenditure proposed doesn't correspond to a fixed or firm scope and the cost estimates for the projects and programs set out in the proposal cannot be added together to form the total expenditure proposed, complicating the process of extrapolation from reviewing a sample of projects.

The response given to one request for information is illustrative of this challenge:

> *Reflecting the stage of the project a negative adjustment of more than 60% has been applied. As such the adjusted forecast is a cashflow that does not correspond to an exact cost build up*[23]

We also note that the amount of the downward portfolio adjustment has not been based on empirical analysis to reflect the business's experience of spend profiles for projects or programs at different stages of development or similar.

We revisit this topic where relevant to the conclusions in the sections below.

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[22] Based on analysis of the negative adjustments in "SIR Capex 2a" of Sydney Water's AIR/SIR
[23] RFI 206

4.4 Projects and programs reviewed

We have reviewed the following projects and programs. These were selected to provide reasonable coverage of service, driver and asset category as detailed in the Inception Report.

Table 4-5 - Proposed capex projects/programs for review

Project/program	Service	Cost driver	Sydney Water proposed FY26 to FY30 spend ($k)	Of this, amount being reviewed ($k)
Aerotropolis Mamre Rd Stormwater	Wastewater	Growth	1,436,217	1,436,217
Resilient & Reliable Water Supply	Water	Growth	1,300,873	1,300,873
Wastewater Treatment Plant Renewals	Wastewater	Renewals	1,249,988	701,203
Critical Sewer	Wastewater	Renewals	1,115,495	1,115,495
Upper South Creek Networks	Wastewater	Growth	1,065,932	1,405,308
South West Growth Area	Wastewater	Growth	880,173	376,288
North West Growth Area	Water	Growth	835,634	1,203,723
Central and Eastern City	Wastewater	Growth	602,126	541,067
Prospect Treatment	Water	Compliance	597,311	599,453
Greater Macarthur Growth Area	Wastewater	Growth	558,598	720,660
Water Filtration Plant Renewals	Water	Renewals	544,537	544,537
Illawarra Growth Region	Wastewater	Growth	520,288	189,860
Greater Penrith to Eastern Creek (GPEC)	Water	Growth	506,227	740,576
Western Sydney Airport Growth Area	Water	Growth	479,206	553,044
Water Reservoir Renewals	Water	Renewals	304,859	305,993
Water Metering	Water	Renewals	292,090	195,571
Stormwater Renewals	Stormwater	Renewals	247,801	255,897
Critical Watermain Renewals	Water	Renewals	240,115	241,000
Wet Weather Overflow	Wastewater	Compliance	239,343	241,040

Project/program	Service	Cost driver	Sydney Water proposed FY26 to FY30 spend ($k)	Of this, amount being reviewed ($k)
Workplace Accom. Program - Operational	Corporate	Renewals	234,487	234,487
Reticulation Watermains Renewals	Water	Renewals	207,336	208,104
Systems of Differentiation	Corporate	Renewals	156,826	156,826
Systems of Monitoring & Control	Corporate	Renewals	146,816	146,816
Foundation Systems	Corporate	Renewals	109,578	109,578
Systems of Record - Other	Corporate	Renewals	106,456	106,456

Source: Analysis of SIR Capex 2

NB. The amount being reviewed is less than the total expenditure in many cases because the name in the SIR covers a number of sub projects or programs.

We now examine the proposed expenditure by driver, with the exception of Corporate capex which we examine separately as set out below.

4.5 Growth

4.5.1 Overview

Sydney Water has spent an average of $692M p.a. in the current Determination period (FY21 to FY24) on servicing growth and is proposing a significant increase to an average of $2,005M p.a., i.e. a near trebling of the current level of expenditure.

Following a significant underspend of $376M in FY21, it overspent the allowance (an average of $532M p.a.) in the 2020 price period by 30%, with spend in FY24 $794M above the 2020 assumptions.

Servicing growth is the largest proposed expenditure area, but it also contains significant uncertainty. The majority of expenditure relates to water and wastewater servicing plus associated treatment plant of the following six growth areas:

- Upper South Creek Networks;
- South West Growth Area;
- North West Growth Area;
- Central and Eastern City;
- Greater Macarthur Growth Area;
- Illawara Growth Area.

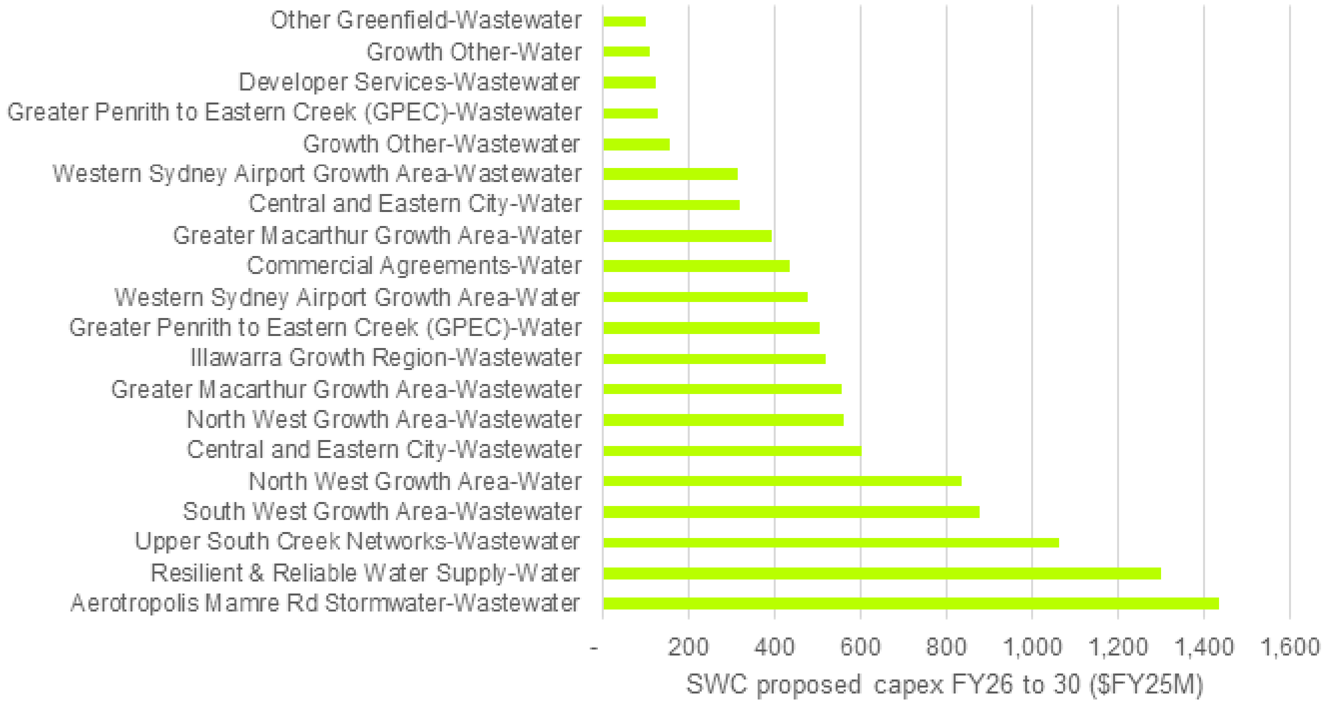
Ancillary expenditure on growth servicing totals $214M in the next price period, bringing the total proposed growth servicing cost in Period 1 to $8,325M, or $1,665M p.a. on average over the price control.

In addition to the growth areas there are significant expenditure drivers associated with:

- The 'Resilient and Reliable Water Supply' strategy ($1,306M in Period 1), 75% of which relates to the expansion of the water network to accommodate the Sydney Desalination Plant expansion.
- The Mamre Road and Aerotropolis stormwater projects ($1,442M in Period 1).

It should be noted that the above costs account for the project, program and portfolio level reductions described previously. The breakdown of proposed expenditure according to water and wastewater services is shown below.

Figure 4-10 - Sydney Water proposed growth capex by initiative



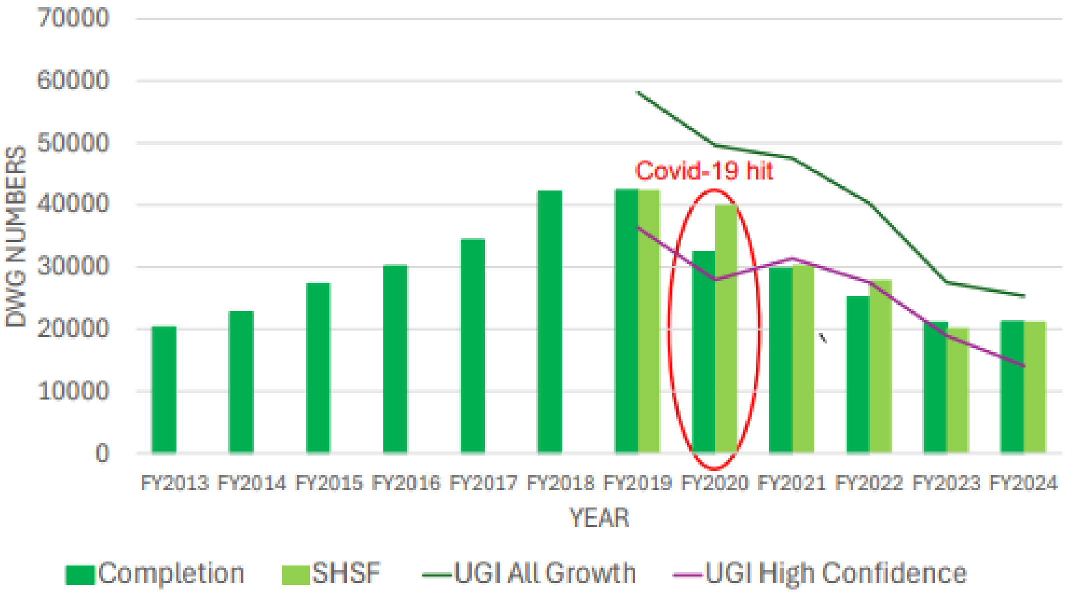
Source: Analysis of AIR/SIR (lines >$100M only)

4.5.2 How Sydney Water plans for growth

The Sydney Water growth forecast is managed through the Urban Growth Intelligence (UGI) layer on its GIS. The UGI is a standalone dataset separate from the SHSF forecast layers; however, the UGI and the SHSF are consolidated to cover the whole of the Sydney Water service area. The UGI layer contains projected development based on developer and planning information for those precincts that have been zoned, unzoned and where developer planning activity is significant. This is referred to as the 'High Confidence' growth forecasts. This does not cover all precincts within the Sydney Water supply area, so where there is no 'high confidence' data the UGI uses base layers from SHSF (housing) and Travel Zone Projections (TZP; jobs). This provides a continuous background layer of polygons containing growth projections, and includes developments not tracked in UGI (e.g. small developments). Importantly the SHSF/TZP data are overwritten where Sydney Water has more detailed intelligence.

A comparison of the historical accuracy of the UGI layers in comparison to the SHSF and actual completions is provided below.

Figure 4-11 – Dwelling completions versus SHSF projections, 2013-2024

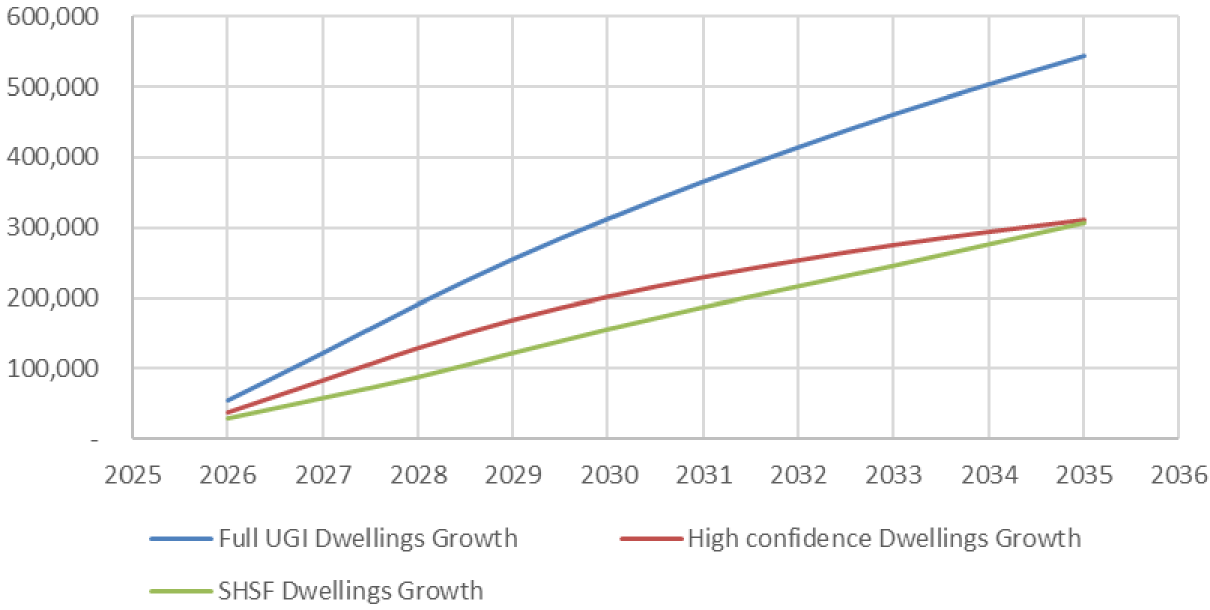


Source: SWS Presentation Material from IPART Growth Review Session

It should be noted that this is an average across the SHSF and does not acknowledge discrepancies across areas where some completions will trend higher or lower than the SHSF.

In terms of the forecasts, because the 'High Confidence' data in the UGI layer is based on more detailed, local knowledge, it will tend to be focused on known and planned development areas, compared to the SHSF which uses a 'top down' distribution of expected growth that is more evenly distributed into growth precincts across the region. The UGI layer then contains SHSF growth forecasts where there is insufficient 'High Confidence' understanding. That means that overall, **the unconstrained total forecast in the UGI layer is significantly higher than the SHSF forecast on a whole area basis**. **A comparison of the 'High Confidence' UGI forecast, total UGI forecast and SHSF forecasts across the Sydney Water area is provided in Figure 4-12 below**.

Figure 4-12 – Comparison of growth forecasts for 2025-2035: full UGI, High Confidence UGI and SHSF



Source: Sydney Water RFI Response nr 167 "Growth Forecast Comparison for Greater Sydney and Illawarra Total Dwellings".

Strategic level assessments such as the Resilient and Reliable Water Supply (RRWS) have clearly used the SHSF data and split this down into areas. For growth servicing and less strategic options Sydney Water has used the consolidated layer within the UGI. In some cases (e.g. the original Wilton growth servicing strategy) other sources of data such as the Town Council housing target forecasts have been used.

At the more local level this combination of spatial and temporal data within the UGI tends to mean that, in aggregate, the Business Cases will tend to follow the 'unconstrained' full UGI dwellings forecasts when they are added together.

Sydney Water has implicitly recognised this by carrying out the first layer of adjustment, at the individual project/scheme level, described in Section 4.3.3. above. Although there is no formal re-modelling of growth constraints when this adjustment is applied, broadly speaking it ensures that the Business Case costs that are initially fed into the submission (prior to the 'top down' adjustments) are reflective of the 'High Confidence' UGI forecasts.

In relation to the evaluation and use of the 'High Confidence' growth layer for investment planning purposes we note that:

1) Sydney Water has used developer and local authority-based data to provide a much better understanding of the likely areas that growth will be concentrated than the broader, 'top down' SHSF.

2) **The 'High Confidence' UGI growth layer provides similar growth to the SHSF by 2035 but is generally 18 months ahead during the 2028 to 2032 period**. Schemes designed to address system capacity constraints that are reached in this period drive much of the investment in the Plan.

3) This means that the growth included in the UGI 'High Confidence' areas is the same as, or higher than, the growth predicted in the SHSF, which covers a wider area. This explains why the 'Full UGI Dwellings Growth' is much higher than the SHSF, as it adds in SHSF growth for those areas that are not 'High Confidence'. Logically this implies one of three scenarios:

    a. That there will be no growth in the 2025-2035 period outside of the 'High Confidence' growth hotspots. This does not appear likely.

    b. That there will be some growth outside of those hotspots, so the overall regional growth will be higher than forecast in the SHSF.

    c. The 'High Confidence' growth layer is overly-optimistic in terms of growth forecasts, and some of the 2025-2035 housing growth will occur outside of those areas, resulting in regional growth forecasts that are similar to the SHSF, but more concentrated in the 'High Confidence' areas.

Logically we would conclude that the third scenario is the most likely, given that SHSF has performed well in the past. The first scenario does not seem plausible given the rate of re-zoning and allocation that is being carried out as a result of the housing crisis and government policy. The second scenario also does not seem to be a robust basis for setting an expenditure allowance given that it is higher than the SHSF which has performed well in the past.

If the third scenario is correct, then it implies that the Sydney Water growth expenditure in Period 1, as reflected in the individual Business Cases after individual project level adjustments have been carried out (see adjustment layer 1, as described in Section 4.3.3), is on average around 18 months ahead of the level of need. It also means that many of the schemes that are developed in Period 1 to address constraints in the existing system that are expected to materialise in the 2030-33 period could be deferred completely out of Period 1. **We have therefore used the third scenario as the basis of our 'upper' range cost estimates, as explained further in the sections below. We have compared the scope and cost deferrals that we identified through this assessment against the**

second, Program level, of scope deferral applied by Sydney Water. Effectively we have used this scenario to test whether their top down program adjustment is sufficient to reflect a balanced position on growth risk.

It should be noted that when carrying out our assessment of potential scope deferral, we assumed that growth in Period 1 outside of the 'High Confidence' UGI layers would be limited, so local growth servicing can be largely deferred in those areas. For strategic level growth servicing we then considered how much scope could be deferred if scheme delivery were delayed by 18 months.

4.5.3 Adjustments applied by Sydney Water

As noted in Section 4.3, Sydney Water has recognised that the costs for constructing infrastructure that can manage all feasible growth on a proactive basis is not affordable for existing customers, so they have applied significant adjustments to the aggregated schemes that are contained within the individual growth Business Cases. The first, project and scheme level adjustments, have been identified through evaluation between the PMO and the project teams. Sydney Water has stated in its responses to our information requests that, typically, this first screening of the Business Case costs will remove:

- Cost contingencies beyond the P50 (reflecting the logical difference between individual project budgets and the overall price control expectation);
- Allowances for growth beyond the 'High Confidence' forecasts for schemes that are intended to provide strategic network or treatment capacity;
- Other judgement-based decisions to defer or reduce expenditure where Sydney Water considers that it is appropriate to do so within its risk control framework.

The amount of reduction varies considerably between projects, from no change or even slight increases[24] for projects in the latter stages of the planning cycle, to reductions of over 50% for projects in the earlier stages of development, or where they are longer term capacity/treatment allowances that have factored in significant growth beyond the 'High Confidence' forecasts.

Sydney Water has then applied the 'Program' level adjustment, as described previously. This top down adjustment has been estimated based on overall affordability and split into growth areas according to a subjective evaluation of the maturity of the business cases within each area. Although it is a high level cost adjustment it is intended to reflect a deferral of scope from Period 1 to Period 2. The percentage reduction applied in each growth area, plus the Resilient and Reliable Water Supply program, is provided below. These values are broadly (but not exactly) offset by equivalent increases in costs for Period 2.

[24] typically the IPART submission is only higher for those projects where further information obtained by the project teams after the February 2024 data freeze have resulted in cost reduction in the Business Cases

Table 4-6 – Project and Program adjustments applied by growth area

Growth Area	Total Potential Period 1 Investment ($M) (Cost post initial assessment by PMO)	Program Level Adjustment	Percentage adjustment
South West Growth Area & Western Sydney Airport Growth Areas (SWGA & WSAGA)	3,867	1,117	29%
North West Growth Area (NWGA)	1,992	396	19%
Central & Eastern City	1,146	357	31%
Greater Macarthur Growth Area (GMAC)	2,108	328	16%
Greater Penrith to Eastern Creek (GPEC)	822	185	22.5%
Illawarra and Cronulla	842	109	13%
Resilient & Reliable Water Supply (RRWS)	1,458	152	10%

Source: Sydney Water Infrastructure Capital Investment Overview

Program level adjustments have not been applied to the Aerotropolis & Mamre Road Stormwater projects.

As this is a 'top down' adjustment it is not possible to determine the effective reduction that has been applied to individual projects, but typically those areas where there is a greater proportion of expenditure at the OABC or NABC stage have a higher reduction applied. The lack of a direct linkage between the adjustments and scope of the individual Business Cases mean that our assessment of efficient growth expenditure, as described in Section 4.5.6, has used both the detailed project level analysis and a 'top down' needs analysis to identify provide a triangulation of the level of expenditure required in our upper bound scenario.

4.5.4 Review of Resilient and Reliable Water Supply (RRWS)

The whole program for the RRWS includes the following costs, net of the 10% program level reduction that has been applied:

- $1,306M in Period 1 (FY 2026-30);
- $1,364M in Period 2 (FY 2031-35).

Of this, the expansion of the strategic trunk main system to fully accommodate the increase in available capacity of the Sydney Desalination Plant expansion and remove critical single points of failure (referred to as the 'Desal networks and Water System Resilience' project) comprises circa[25] $828M in Period 1.

[25] Because the program level adjustment is 'top down', the exact allowance is not defined, but these are the costs if the 10% period 1 and 28% period 2 overall program deferral for RRWS is used.

The remainder of the program is associated with the development of the Purified Recycled Water (PRW) works in Quaker Hills, Prospect, Liverpool and Camelia.

In terms of water resources, the Greater Sydney Water Strategy 2022 (GSWS) recommends that new resources must come from Rainfall Independent Supplies (RFIS) where this is practicable. . Sydney Water has then carried out a reasonable level of optioneering and water resource modelling to support its chosen portfolio, which considers this preference for RFIS. The chosen portfolio, which includes the additional purified recycled water (PRW) works in Period 2 and beyond, achieves the following Level of Service Outcomes:

- The immediate construction of the 250 Ml/d SDP expansion means that the need for Level 5 restrictions is almost avoided even if a 1 in 100,000 year drought started in January 2025. This is maintained in the short term for a drought starting now. For the longer term forecast, including growth and climate change, the total risk of failure over the 2025 to 2056 period falls from 3.57% without the SDP expansion (equivalent to an annual average return period of failure of around 1 in 825 years) to 0.62% with the SDP expansion in place (equivalent to an annual average return period of failure of around 1 in 5,000 years)
- With growth and climate change factored in, the construction of the staged PRW plants alongside the SDP expansion means that the cumulative risk of any Level 5 restrictions in the period 2025 to 2056 reduces from the 0.62% (down to 0.02% (equivalent to an annual average return period of failure of around 1 in 100,000 years).
- Expected risk of any Level 3 restrictions by between 2025 and 2056 is expected to be 5.4% with just the Sydney Desalination Plant (SDP) expansion in place (equivalent to annual average return period of just over 1 in 500 years). With the additional PRW plant in place this would reduce to a 0.5% risk over the 2025-2056 period equivalent to annual average return period of just over 1 in 5000 years).

Because the required Levels of Service are not set out with the GSWS and the probability of failure (or return period) that needs to be planned for is not set, there is no straightforward requirement that can be used to justify the risk targets indicated in the strategy. Similarly there is no absolute requirement to construct new supplies, with the GSWS simply stating that Sydney Water should:

> ***Construct new rainfall-independent supply assets when needed*** *(with construction triggers based on the time required to deliver first water to the network prior to dam levels reaching critical levels in drought).*

However, the GSWS does visually indicate (see Figure 14 of the GSWS) that a new significant supply side option is required in the near future, and that this should be a rainfall independent resource, so the need for the Sydney Desalination Plant expansion is reasonably clear. The need for options beyond that is less clear, and is largely driven by complying with the general recommendation that Sydney should increase its proportion of RFIS. As noted above, the preferred Sydney Water program would lead to a risk of failure of around 1 in 100,000 years.

Sydney Water provides an assessment of differently risk levels according to the amount of RFIS built in its Strategic Business Plan options appraisal. These are shown for the ‘Business as Usual’, ‘Minimum Build’ and ‘Triggered Build’ cases. A summary of the differences between these cases is provided in Table 4-7 below.

Table 4-7 – SDP expansion options set out by Sydney Water in its Strategic Business Plan options appraisal

Option	Description	Schemes 2025-35	Schemes 2035+	Cumulative risk of L3 restrictions (dam levels<30%) by 2056	Cumulative risk of supply failure (dam levels<15%) by 2056
BAU	SDP expansion only	SDP (2027)	None	5.4%	0.62%
Triggered Build (SBC option 5)	Build RFIS projects (post SDP expansion) based on climate triggers	SDP (2029) – 250 Ml/d	Illawara desalination and some PRW (49 Ml/d) planned for 2053	4.4%	0.31%
Minimum Build (SBC option 3)	SDP expansion (as soon as possible) then prioritise PRW expansion	SDP (2026) – 250 Ml/d Quakers Hill PRW Stages 1&2 (2033) – 69 Ml/d	Other PRW – 93 Ml/d in total	0.5%	0.02%

Source: Sydney Water Business Case

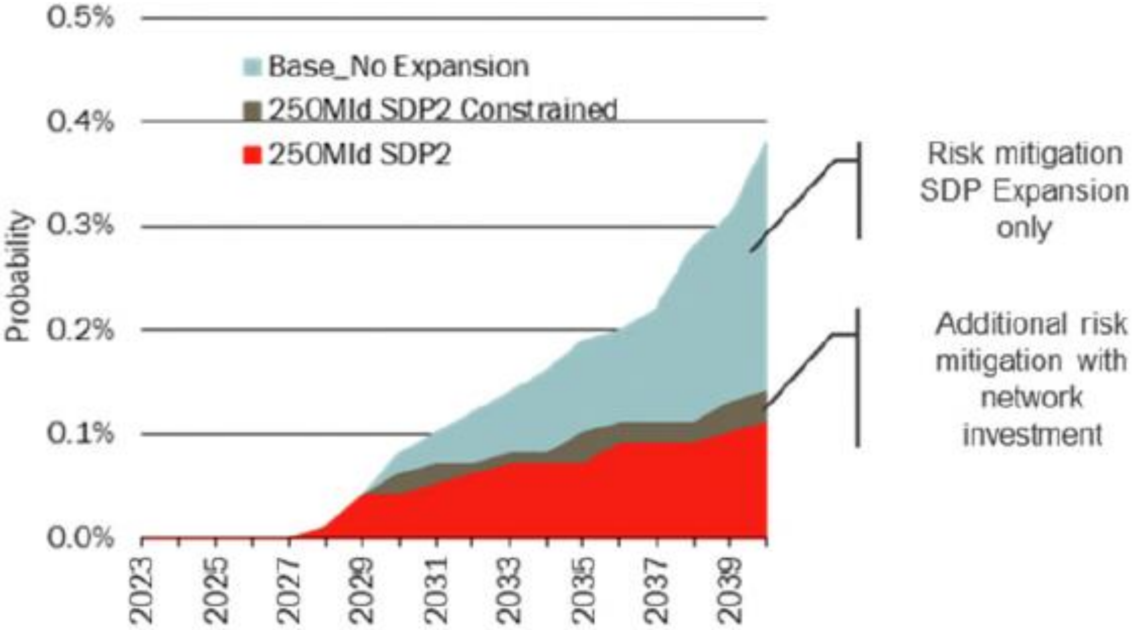
The risk reduction overall is therefore clear. Overall, the supply deficit is identified by Sydney Water as being around 20-90Ml/d in the base year, and growth plus climate change is forecast to worsen this position by around 130 Ml/d by 2035, so the total deficit in 2035 is in the order of 150-220 Ml/d.

Without the SDP network expansion scheme, Sydney Water estimates that the total demand that could be served by the expanded SDP under Level 3 restrictions is in the order of 450 Ml/d – i.e. it could limit the use of the SDP expansion to only 200 Ml/d out of the 250 Ml/d available.

Sydney Water has therefore identified the need to construct the SDP Network expansion, which is a series of trunk mains and pumping stations that are required to allow the SDP water to feed into areas that it cannot currently supply. However, the needs case for investment in Period 1 is very marginal, with this expansion only required to mitigate the risk of level 5 restrictions at extremely low return periods, and even then not all of the water is required until the cumulative risk of failure increases later in the planning period.

The Business Case to support the SDP network expansion supports the observation that the impact on supply/demand balance risk is marginal. Whilst Sydney Water does not provide an analysis of the levels of risk with PRW in place, it does provide a figure (Figure 4-13) that shows the cumulative level of risk of ‘failure’ (i.e. the risk of dropping to 15% in Warragamba Dam) with and without the SDP extension over the 2028-2040 period. Overall this means that the cumulative risk of failure is only reduced by around 0.02% over that 11 year period, equivalent from moving the return period from an average of around 1 in 8,000 years down to an average of 1 in 10,000 years.

Figure 4-13 – Risk of supply failure with and without the SDP expansion



Source: Sydney Water SDP Expansion Network Project Business Case

The needs case for starting the construction of the SDP network expansion in Period 1 is therefore marginal, if it is only considered in terms of drought mitigation benefits. The expansion of the network is likely to be required if Sydney Water wants to use the expansion of the SDP plant to its full capacity whilst Level 3 restrictions are in place, but there is enough demand on the existing network to allow the expansion to be fully utilised before demand restrictions come into force. The ability to use the full SDP expansion to delay recession in Warragamba dam levels prior to Level 3 restrictions is one of the reasons the network expansion has such a small impact on the risk of 'failure' In terms of additional resilience benefits. Sydney Water have also noted that the SDP network expansion would reduce reliance on Prospect Water Filtration Plant (WFP) as the single source of water for much of the city, and reducing two major single points of failure in the network. Whilst this is aligned with the requirements of the GSWS[26], it represents an improvement to the risks that already exist, and as noted in the Business Case, **customers and stakeholders have not yet been consulted on their willingness to pay for non-drought resilience improvements given the other substantial bill rises that are proposed.**

Based on the above we consider that, whilst the SDP network expansion will be required as part of the longer-term water strategy for Sydney, the case for carrying out the work within the 2025-30 period is weak and it appears that the work could be deferred without a significant increase in water supply risk to the city. This would reduce the Period 1 expenditure by $828M ($920M pre program adjustment of circa 10%).

In terms of the PRW schemes contained in the strategy, again much of the water resource need is based on the promotion of RFIS, and the desire to move to an extremely low risk of failure (1 in 100,000 years). However, much of the treatment upgrades required for the PRW plant are required for growth and nutrient discharge compliance purposes in any case, so they are relatively low cost options for expanding RFIS in accordance with the GSWS. The first proposed scheme, Quakers Hill, is stated as requiring advanced treatment by 2031 and this appears to be a relatively firm requirement. However, if the need to expand RFIS is given less priority then it would be reasonable to defer the start of development of the remaining schemes, which could save $47M under a lower bound cost scenario.

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[26] Under priority 2, the GSWS recommends *'Improving system integration and interconnection to manage system risks and ageing infrastructure and asset capability'*

4.5.5 Review of Aerotropolis/Mamre Road Stormwater

The Aerotropolis stormwater management scheme covers a total of 6 areas of development, and represents a 'new' way of managing runoff from impermeable surfaces, which will mitigate the impact on local creeks and can be used to help 'green' the development through the use of passive watering systems (effectively the drainage system is used to water green areas on its way to retention ponds.). Sydney Water refers to the ongoing Mamre Road development, which will be the first in the area, separately to the rest of the project, which they refer to as 'Aerotropolis'. We have used this naming convention in the assessment below.

The program costs for the Aerotropolis and Mamre Road schemes in the SIR are as follows:

- $1,436M in Period 1 (FY 2026-30);
- $1,697M in Period 2 (FY 2031-35).

In response to RFI 165, **Sydney Water has also indicated that the costs for Aerotropolis have reduced considerably in comparison to the IPART submission** due to general project delay from the referral to IPART for special efficiency review for the Mamre Road component, updated growth intelligence (up to 2 years delay compared to prior assumptions), updated land acquisition and hence land tax costs and an increased likelihood of requirement to find efficiencies. Over the longer term, growth forecasts are based on NSW planning assumptions around the number of hectares to be released in the catchments, so the overall pace of delivery is a reasonable central estimate. However, for the shorter term, updated growth intelligence has indicated a delay of up to two years compared to the Strategic Business Case and proposal assumptions, which has largely affected the Aerotropolis area.

This means that for Aerotropolis the costs submitted to IPART need to be reduced by $514M in Period 1, and the overall project costs have reduced by 26%. The total current proposed capex for the two schemes in Period 1 prior to any other adjustments should be $922M.

In terms of the nature of the capital works required, the Mamre Road stormwater proposals have already been the subject of a detailed assessment by IPART, which effectively recommended a 16% cost reduction on capex for the scheme. **Although the majority of the scheme proposals were found to be efficient by the IPART review it was concluded that the retention basins could be smaller and deeper, saving on both civils costs and land purchase costs totalling 16%. Applying this 16% efficiency to the proposed $390M Mamre Road capex in Period 1[27] suggests an adjustment of $62M.**

Both of the above adjustments have been included into our upper bound scenario.

For Aerotropolis it is reasonable to assume that scope reduction on the retention basins can also be achieved, as there is no material difference in the nature of the proposals and similar design assumptions were used. However, the cost reductions for Aerotropolis described above already include a proposed 40% reduction in relevant costs, so they already account for such efficiencies.

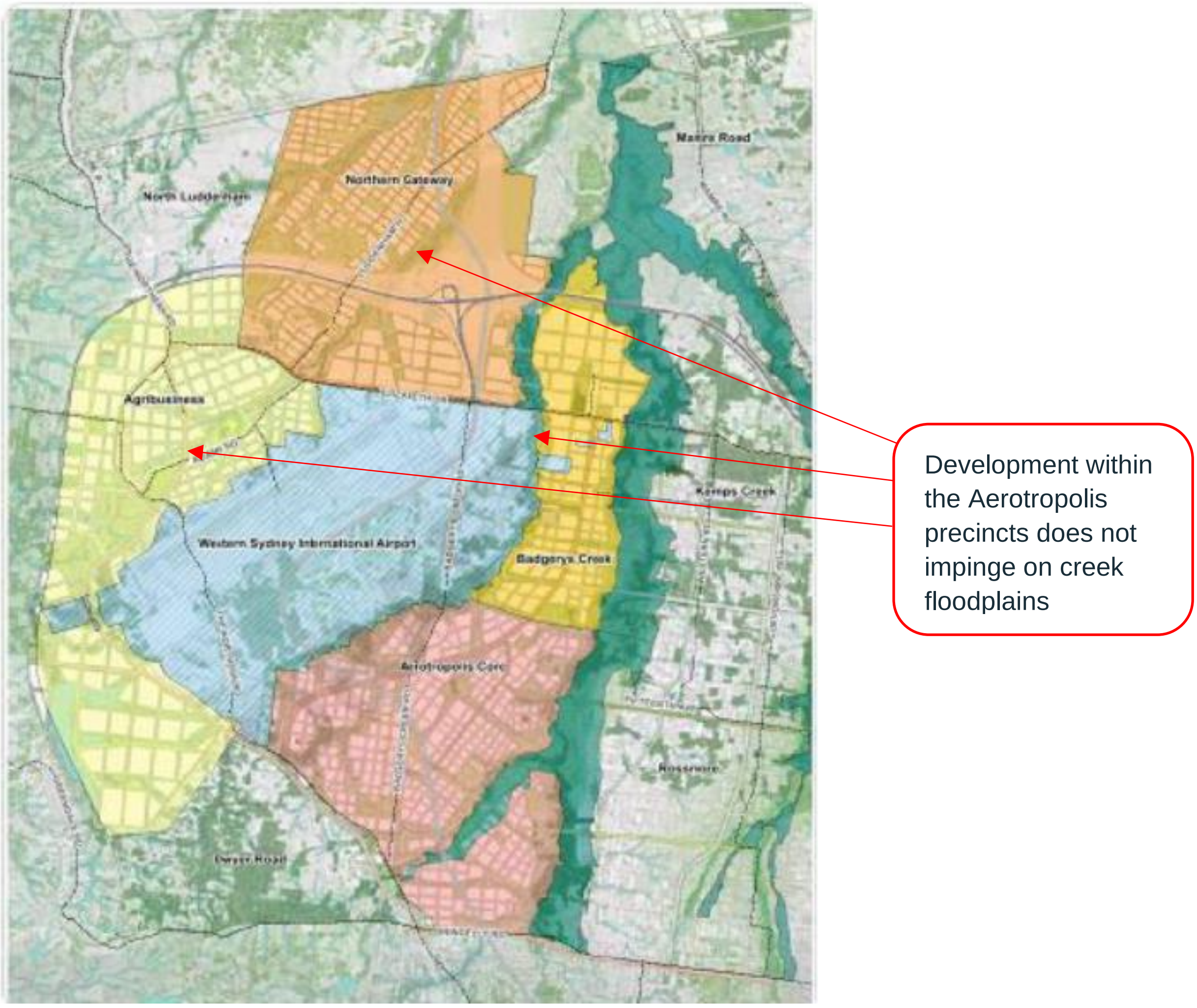
In terms of delivery cost, the assessment used for Aerotropolis mainly follow a similar approach to Mamre Road, which was considered to be efficient by the TWG. Both schemes have used fairly high level assumptions, but they have included some scope optioneering to reduce the amount of drainage infrastructure. IPART's efficiency review of the scheme found that additional greening and recycled water supply benefits were 'ancillary'. That is, they did not drive the scheme design, optioneering nor cost.

[27] Based on analysis of Sydney Water document "165. Mamre and Aerotropolis stormwater scheme ICs and growth FY25 - FY35"

There is a notable difference in terms of the assumptions around the purchase price for land associated with the retention basins in the Aerotropolis project. For Mamre Road the zoning excluded the floodplain, so project land costs are estimated as being 86% Environmental and Natural Zoning (ENZ), as retention basins can be located within this zone. For Aerotropolis much of the area has been zoned for development across the creek areas, so only 30% of the land costs are assessed as being at ENZ rates. Overall land costs per hectare were therefore $341/m^2, compared with $164/m^2 for Mamre Road.

From the presentation provided to us it appears that most of the developer land packages within the Aerotropolis precincts stop at the edge of the floodplain (see Figure 4-14 below, replicated from the presentation), so the land within the creek floodplains is not subject to the level of competition that could justify sales at the price that is currently assumed for the scheme.

Figure 4-14 – Development precincts within Aerotropolis



Source: Sydney Water presentation 5B

Any potential for ‘real’ land costs to be below the zoned costs for floodplain areas is not currently accounted for in the cost calculations, and scheme infrastructure has not yet been evaluated on the basis of combined land and infrastructure cost optimisation. If land costs reduced by 50% of the current difference from the levels forecast for Mamre Road, this would result in a land cost reduction of 26% for the overall scheme. Around 6% of this has already been allowed for in the reduction between the IPART submission and current Sydney Water cost estimates, and much of the land purchase has been deferred out of Period 1 for Aerotropolis. **The potential saving is therefore around 20% of $148M, or $30M in Period 1, although this is very uncertain as Sydney Water is obliged under the Land Acquisition (Just Terms Compensation) Act to avoid land severance or reduce the**

value of remaining land when they purchase land for their basins. We have therefore only included this in our lower bound scenario.

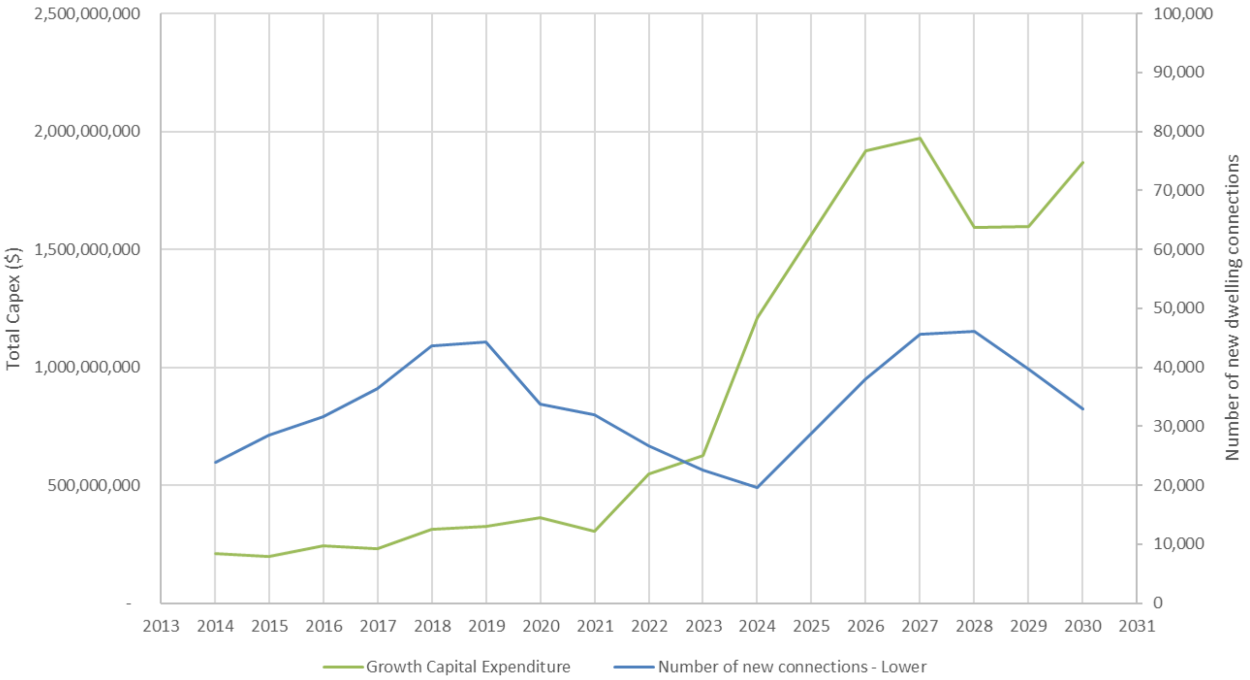
4.5.6 Review of other growth capex

A summary of the trend in capital expenditure to support growth is provided in Figure 4-15 below. This shows the significant increase proposed by Sydney Water, which is associated with both an increase in the number of new properties, and the nature of the infrastructure that is required to service them. As noted by Sydney Water there are a number of material changes in the nature of the growth servicing that means the cost per property served would logically increase significantly compared to historical expenditure. These include the following:

- Most of the growth of forecast to occur within 'greenfield' developments.
- Much of the strategic network capacity for water and wastewater transfer is nearing its limit, so new strategic interconnectors will be required to service the growth. This includes capacity in the NSOOS and SWSOOS main wastewater tunnels that currently take wastewater from the city to the coastal processing and discharge plants.
- There is insufficient treatment capacity in existing inland wastewater treatment plants to service the growth, and the Upper Nepean/Hawkesbury river system cannot accept significant increases in nutrient loads under the environmental regulatory system. New wastewater treatment capacity is therefore required with very high treatment standards (typically involving Reverse Osmosis plant for dry weather flows).

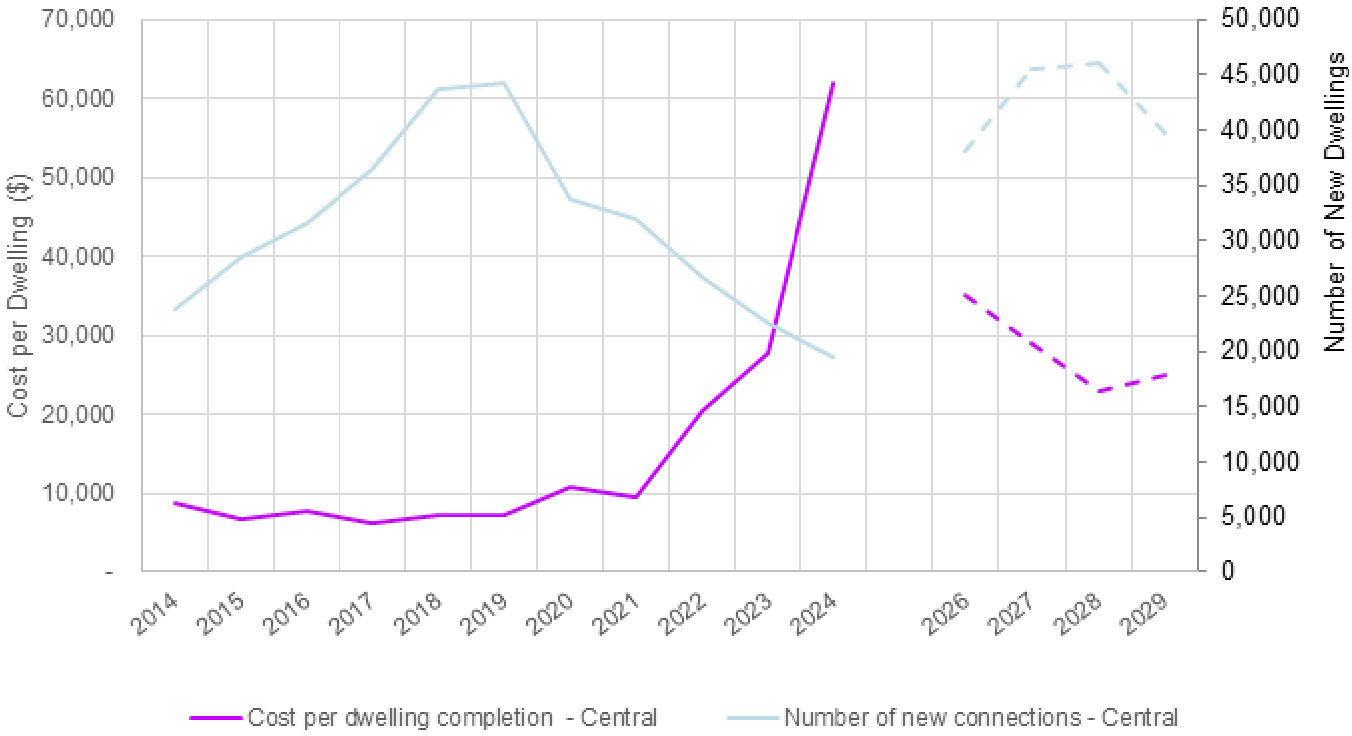
Figure 4-15 and Figure 4-16 below show the average growth cost per new property historically compared with the IPART submission. The first figure provides costs in aggregate, and the second figure provides costs on a per property connected 'in year', which demonstrates the very significant increase in costs to serve each property. The 'spike' in unit costs in 2024 is reflective of the leading nature of the growth infrastructure development – in reality the costs for 2024 are reflective of growth around 2026/27 as much of growth capex has to happen in advance of connections.

Figure 4-15 – Growth capex and new connections



Source: Analysis of RFIs 163, 164 and 167 (NB: excludes RRWS and Aerotropolis stormwater)

Figure 4-16 – Growth capex per dwelling connected (historical and forecast)

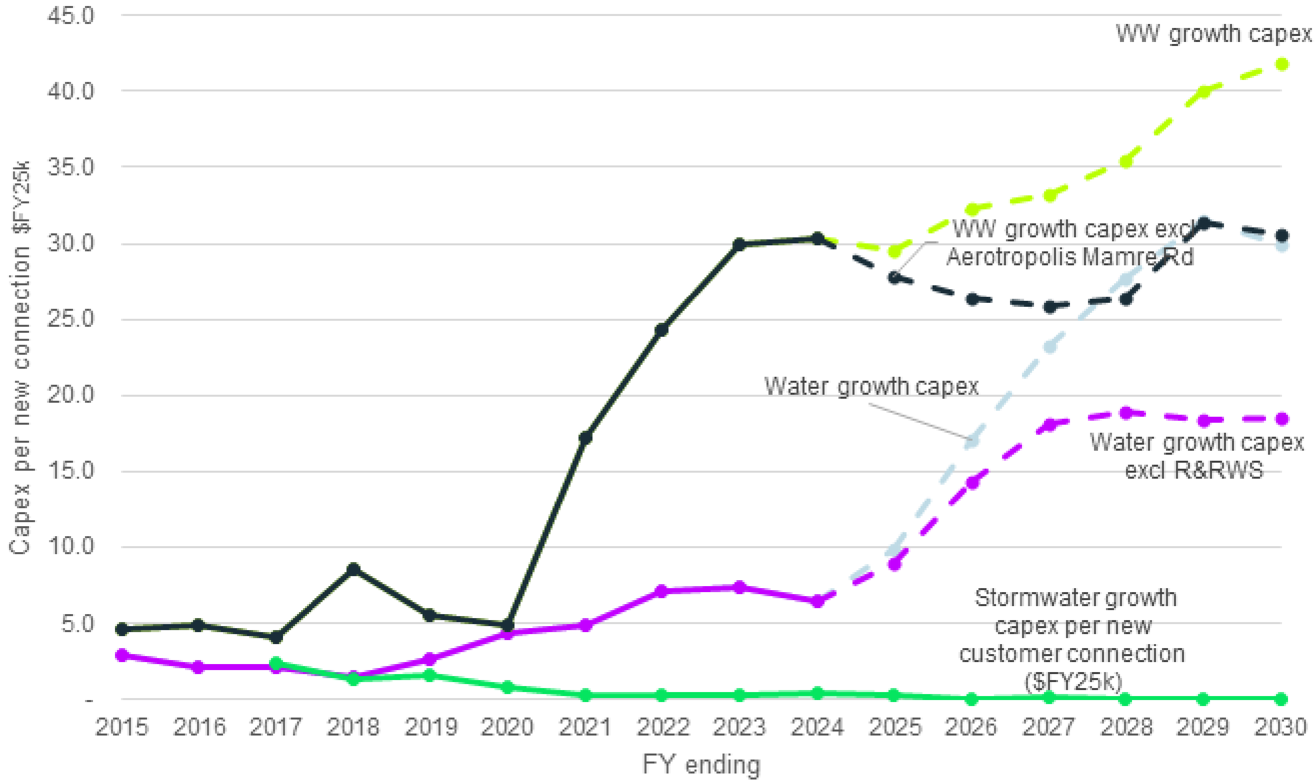


Source: Analysis of RFIs 163, 164 and 167 (NB no data were provided for 2025)

The above analysis uses in-year costs and completions, which makes it volatile to annual fluctuation, and merges the two services (water and wastewater). If the analysis is smoothed and separated into the three services, then the average cost to serve **is as** shown in Figure 4-17. This **shows that the majority of the current increase is within the wastewater service, and relates to the provision of new advanced** water treatment facilities for planned areas of greenfield development. This stepped increase continues throughout the program, partly because of the higher costs associated with the provision of wastewater networks, but mainly because the capacity of the NSOOS and SWSOOS long sea outfall transfers is expected to be fully utilised by the start of Period 2, so all new development has associated high treatment costs.

The increase in water growth capex, if the RRWS is excluded, increases later in the program and not as significantly as wastewater. This is because the increase is less dominated by treatment costs (there are PRW costs, but these are minor once the main wastewater treatment plant (WWTP) has been constructed, and later in the program), so the cost increase is a combination of greenfield development plus some strategic network infrastructure that has been forecast as being required to meet growth in Period 2.

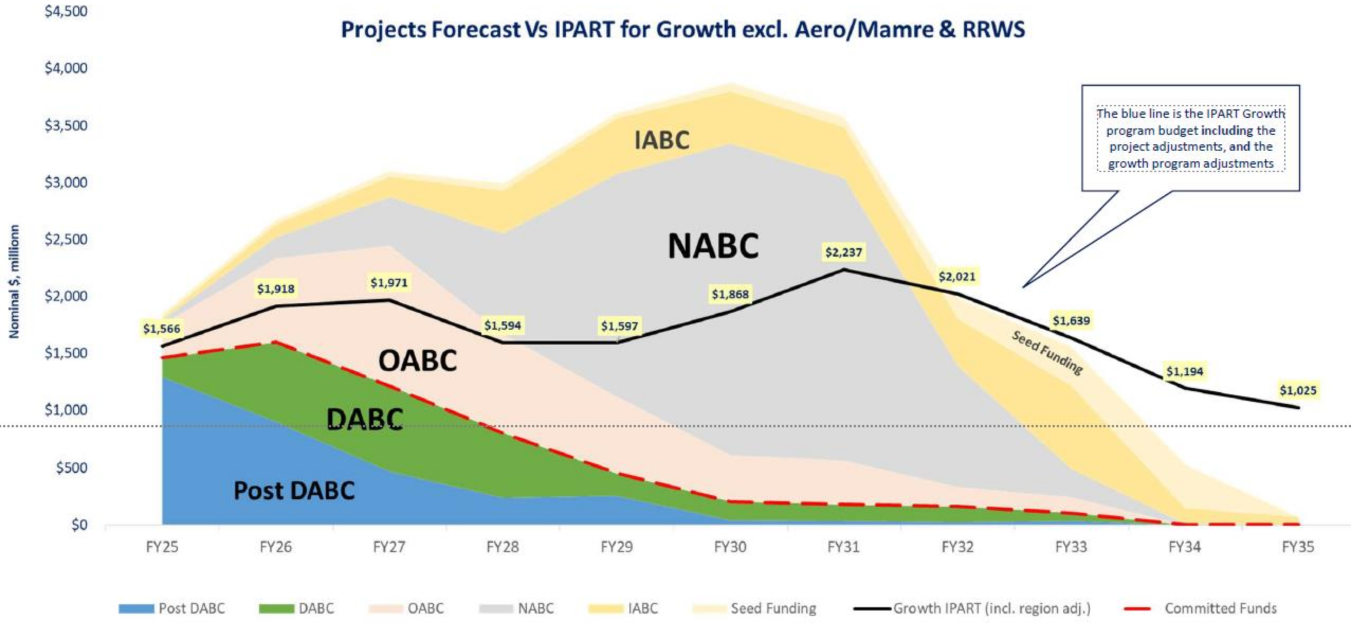
Figure 4-17 – Growth capex per dwelling connected (historical and forecast) – rolling average spend and connections



Source: AtkinsRéalis analysis of the AIR/SIR

As noted previously, Sydney Water has recognised the significant bill impacts associated with expenditure to service growth and has carried out both a project challenge and program deferral exercise to smooth out the potential expenditure identified in its Business Cases. The high level Sydney Water analysis of this challenge and deferral is provided below (see Section 2.3.1 for the definition of each delivery stage).

Figure 4-18 – 'Top Down' Assessment of Need and Cost



Source: Sydney Water Presentation for Growth Expenditure (3B)

Most of the expenditure shown in the first two years relates to projects that are either in the DABC stage or in the delivery (post DABC) stage, and are required to service growth in High Confidence, well committed development areas. Most of the OABC and NABC project expenditure within the 2025-30 period then relates to the servicing of growth beyond 2030.

With regards to this high level analysis, we note that **the near term 'High Confidence' growth rates that are being serviced through the DABC+ projects are actually higher in aggregate than the SHSF**, and are formed of projects that will be in areas that attract the high cost per new dwelling described above. As shown in Figure 4-15 the infrastructure costs tend to lead growth by 2 or 3 years, so logically it would seem reasonable to assume that the current rate of infrastructure servicing (i.e. projects in design planning or being delivered) reflects the point of maximum growth rate around 2027/28, so this rate of spend should be sufficient to continue to service growth beyond that. This would suggest that a run rate in the order of $1.57Bn per annum (equivalent to the predicted cost run rate in FY25) therefore represents reasonable estimate of the cost required for future growth investment. Although work will be required in areas that are currently being considered under OABC and NABC Business Cases, there is no clear case why the aggregate costs for all projects would be higher than the much better defined, largely committed expenditure that is proposed in 2025. If this run rate is used, then costs would be circa $7.85Bn for FY26-30, compared with the proposed expenditure of $8.95Bn in the reduced and reprofiled Sydney Water submission (i.e. a 12% reduction in scope).

We acknowledge that this is a very simplistic assessment, and factors such as an increasing need to expand treatment capacity in future years beyond the rate already contained in the DABC+ projects could potentially justify the increases that are proposed. As part of the capex assessment we therefore carried out a sample review of 11 projects/programs to examine the 'bottom up' needs for the individual projects described within the Infrastructure Capital Investment report. Details of this assessment are provided in the 'Program Specific Details' section of this report. A summary of the findings relating to potential scope deferral and efficiency is provided in the tables below. The cost reductions identified relate to the capex submitted to IPART prior to the program level adjustments applied by Sydney Water, so our reductions are compared against the contribution to the overall program level adjustment derived from each of the projects.

Table 4-8 provides a summary of the following numbers:

- The cost allocated to each of the program areas that we analysed in detail before the 'program level adjustment' has been made by Sydney Water. This is for Period 1 (2026-30 only).
- Our assessment of scope items that can be fully deferred or removed as we do not consider there is a compelling case for short term investment.
- Our assessment of the potential scope deferral for the remaining costs that could occur if growth is delayed to align with the Sydney Housing Supply Forecast (SHSF), which is effectively around 18 months behind the Sydney Water 'High Confidence' growth at the end of Period 1.
- Our assessment of the potential scope deferral that could occur if schemes are delayed by a further 12 months. This is a relatively marginal change and could reflect a lower growth rate, or be reflective of investment if Sydney Water take a high risk approach to the management of growth, adopting a 'just in time' approach to servicing SHSF growth and a high risk strategy to capacity in the long sea outfall connectors. Under that scenario there is a larger risk that water and wastewater infrastructure could act as a constraint on growth in some areas, even if it follows the SHSF.
- Our assessment of any obvious delivery cost reductions that might be achieved above and beyond those already assumed by Sydney Water (10%).
- A comparison between the cost reductions associated with our medium and low growth scenarios and the program level cost reductions applied by Sydney Water.

Table 4-9 then provides a more detailed analysis of the rationale behind the figures presented in Table 4-8.

If a cost weighted average is taken of the schemes contained in Table 4-9, then the amount of cost that could be deferred if all elements that are not well justified for Period 1 are excluded, and remaining costs are deferred by 18 months to reflect the difference between the ‘high confidence’ growth scenario and the SHSF, is 9% more than the Sydney Water Program level adjustments. When combined with the ‘top down’ analysis provided earlier, this indicates that the upper bound of growth expenditure should be between 9% and 12% lower than the Sydney Water net growth proposals.

If investment were deferred on average by 12 months beyond this, then this would reduce costs by a further 10%, which we have assumed represents the lower bound of a reasonable cost envelope.

Table 4-8 – Summary of findings from sample review of 11 capex projects/programs and potential expenditure scenarios

Project	IPART costs for Period 1 before program level adjustment	Our view of possible scope and cost reduction for Period 1				Area level program adjustment applied by Sydney Water (deferral from Period 1 to Period 2)	Total percentage reduction that could be applied to derive an upper end estimate	Total percentage reduction that could be applied to derive a lower end estimate
		Adjustment due to uncertain need in Period	Adjustment if growth planning is limited to SHSF	Adjustment if growth is delayed by 12 months later than SHSF	Project Cost Savings (beyond 10% portfolio level assumed by Sydney Water)			
SWAGA / WSAGA water networks	$437M	$175M	$30M	$101M	$33M (14% of remaining costs)	29%	54%	71%
Upper South Creek Networks	$1,405M	$ - None	$567M	$690M	$ - None (large efficiency needed to match IPART)	29%	40%	49%
Upper South Creek AWRC	$553M	$91M	$107M	$178M	$- (10% already allowed for on the project)	29%	36%	49%
Wilton Growth Servicing and Baringa Gorge RWP	$439M	$ - None	$152M ($23M RWP, $125M phase 2)	$170M	$6M (2% of remaining costs under high certainty growth.)	16%	36%	40%
GPOP WCM	$195M	$ - None	$59M	$98M	$ - None	31%	30%	50%
Upper Nepean	$721M	$ -	$72M	$159M	$ -	16%	21%	31%

Project	IPART costs for Period 1 before program level adjustment	Our view of possible scope and cost reduction for Period 1				Area level program adjustment applied by Sydney Water (deferral from Period 1 to Period 2)	Total percentage reduction that could be applied to derive an upper end estimate	Total percentage reduction that could be applied to derive a lower end estimate
		Adjustment due to uncertain need in Period	Adjustment if growth planning is limited to SHSF	Adjustment if growth is delayed by 12 months later than SHSF	Project Cost Savings (beyond 10% portfolio level assumed by Sydney Water)			
		None						
North West Treatment Hub	$613M	[redacted]	$88M	$264M	$16M	20%	31%	60%
Northwest Growth Area & Metro North West Servicing Program	$281M	$- None	$59M (Excludes Oakville Water Supply Zone upgrades, which will deliver by 2028 with a forecast cost of $83M)	$99M (Excludes Oakville Water Supply Zone upgrades, which will deliver by 2028 with a forecast cost of $83M)	$- None identified	20%	21%	35%
Malabar Near Term Works	$916M	$- None	$150M Includes Glenfield WRRF and Liverpool WRRF Upgrades only	$451M Includes Glenfield WRRF and Liverpool WRRF Upgrades only	$- None identified	29%	16%	49%
Malabar Mid Term	$213M	$- None	$107M	$178M	$- None identified	31%	50%	83%
Illawara Growth Area	$190M	$- None	$25M Changed to default to 13% - see next table	$95M	$- None identified	13%	13%	50%
GPEC and Orchard Hills	$741M	$- None	$159M	$265M	$- None identified	22%	21%	36%
WP200	$310M	$- None	$116M	$194M	$- None identified	20%	38%	63%

Source: AtkinsRéalis analysis

4.5.6.1 Program Specific Details

The table below provides additional detail on the findings from the 11 programs and projects reviewed, which are summarised in Table 4-8 above.

Table 4-9 - Capex investment program specific details

Project/ Program	Planning Status	Latest Project Cost 2026-2035 ($M Real)	Submitted IPART Cost ($M Real pre program level adjustment)*	Potential Scope Deferral /Reduction (can scope be removed or deferred from Period 1)	Potential Cost Efficiencies (can the remaining scope be delivered at a lower unit cost)	Notes and Associated Risks
SWGA & WSAGA Water Network	Planning/ NABC	507 P1 423 P2	437 P1 210 P2	The initial stages of the network are required to service high confidence development. However, all but $209M of the scheme costs in Period 1 and Period 2 (business case costs) are planned to be delivered to service growth and resilience for 2031 and beyond. The $209M is all intended for delivery by FY28, so should be completed within Period 1 even if there is some slippage or deferred need. Around $175M of the costs to service post 2030 growth relate to a 10km 1200mm interconnector from Prospect to Cecil Park, with associated 120 Ml/d pump station and a 30 Ml storage reservoir (total cost is $199M, but 1/6 of the program is in 2031). The need for the interconnector is based on Maximum	Network costs appear high – for example the 12.7km contained in the AeroCore and Agribusiness OABC is $11-120M (P50-P90) for 12.7km of largely DN450mm main, plus a booster pumping station (7% of project costs). This results in an effective unit rate of over $8,000 per metre of mains laid. This compares with an outturn of $285M for the 41km South Creek AWRC pipelines (17km 900mm plus 21km DN350mm). Much of the high cost is associated with the anticipated ground conditions and need for micro tunnelling, which was successfully reduced for the AWRC	Deferring some of the costs planned to service growth for 2031 could result in some constraint on growth if overall need exceeds the SHSF for the area. However, as most of this is associated with the Prospect to Cecil Park interconnector, the risks appear to be low for this area.

Project/ Program	Planning Status	Latest Project Cost 2026-2035 ($M Real)	Submitted IPART Cost ($M Real pre program level adjustment)*	Potential Scope Deferral /Reduction (can scope be removed or deferred from Period 1)	Potential Cost Efficiencies (can the remaining scope be delivered at a lower unit cost)	Notes and Associated Risks
				Daily Demand calculations at an unconstrained growth rate, with a 4 Ml/d deficit in 2031, so it is probable that this will not actually be required until after the P2 planning period. Based on the above we consider that $175M of the P1 cost can be deferred without significant consequence. If the remaining expenditure to support post 2023 growth ($59M) is deferred to SHSF levels then scope could reduce by a further $30M. At low growth levels we estimate that the combined Phase 1 and Phase 2 scope could reduce by a further $101M.	pipelines. However, we note that the actual costing approach has been to assume urban mains laying unit rates with a 30% disposal over re-instatement to allow for potential shale rock removal. Comparison with other delivered projects suggests potential efficiencies of at least 10% beyond the default efficiencies assumed for all projects (see costing efficiency section). This results in a $33M reduction when applied to the high certainty mains laying scope.	
Upper South Creek (wastewater) Network (Note – excludes Austral Leppington and Mamre)	Tranches 1 & 2 DABC, Tranches 3-4 OABC	1,763 P1 306 P2	1,405 P1 2 P2	Much of the investment comes from immediate 'high confidence' growth need. However, parts of Thompson Creek Stages 2 and 3, AgriBusiness, Cosgove Creek Stage 2 and Lowes Creek Stages 2 and 3 (tranches 4 and 5) could potentially be deferred until Period 2 of the submission. This covers around $1,100M of the project forecast costs. The dollar reductions	Delivery savings of 10% were achieved through bundling of procurement for tranches 1 and 2. However, to reduce back down to the IPART submission from current estimates will already require $357M savings from tranches 3 and 4, particularly focused on Lowes Creek, where cost	In terms of potential deferral of tranches 3 and 4, Sydney Water notes that there has been developer interest in these areas even where they are not currently re-zoned, so a lack of wastewater infrastructure could delay

Project/ Program	Planning Status	Latest Project Cost 2026-2035 ($M Real)	Submitted IPART Cost ($M Real pre program level adjustment)*	Potential Scope Deferral /Reduction (can scope be removed or deferred from Period 1)	Potential Cost Efficiencies (can the remaining scope be delivered at a lower unit cost)	Notes and Associated Risks
				between the Business Case and IPART figures are assumed to be focused on removing/deferring costs in these areas, so $358M has already effectively been removed or deferred by Sydney Water. The main opportunities for further deferral are therefore likely to limited to the remaining $742M expenditure in these later tranches of work. Some of the costs in these areas will still be needed to service high confidence growth. Therefore, if it is assumed opportunities for further deferral of costs beyond the IPART submission are limited to 75% of the expenditure in the four areas described above, this equates to a potential deferral of $567M. For tranches 1 and 2 and work to support early high confidence growth in the other tranches (estimated at $385M and $185M respectively), opportunities for deferral are limited to the low growth scenario, where	escalation since the IPART submission has primarily resulted from an increased need for micro-tunnelling and depth of pump station. Efficiencies beyond those already included in the IPART submission therefore appear unlikely.	zoning decisions and hence growth in those catchments.

Project/ Program	Planning Status	Latest Project Cost 2026-2035 ($M Real)	Submitted IPART Cost ($M Real pre program level adjustment)*	Potential Scope Deferral /Reduction (can scope be removed or deferred from Period 1)	Potential Cost Efficiencies (can the remaining scope be delivered at a lower unit cost)	Notes and Associated Risks
				there is a potential additional $123M deferral.		
Upper South Creek Advanced Water Recycling Program	Stage 1 in delivery Stage 2 pre planning	462 P1 524 P2	553 P1 360 P2 (overall, 736M is for the stage 2 recycling centre)	The first stage is in delivery and can provide 35 Ml/d of treatment capacity. The second stage effectively duplicates this and is planned for 2034 delivery in the latest Business Case, which is 2 years later than the IPART submission. $91M is therefore already planned for deferral, which needs to be reflected in the SIR. The total expenditure in Period 1 for the Stage 2 works is $376M, minus the $91M referred to above. Under SHSF growth, these costs could potentially be deferred by around $107M, with further deferral to $178M under low growth.	Stage 2 costs are around 90% of the stage 1 outturn. This is based on the assessment of common initial processes that have already been delivered, and Sydney Water has reasonably discounted the feasibility of other efficiencies that might be associated with the physical proximity to Stage 1. .	It is noted that the Environmental Flows generated by the scheme that will support the Warragamba river are not accounted for in the RRWS calculations below, as all changes to e-flow or additional support have been excluded from the calculations used for that Business Case.
Wilton Growth Servicing and Baringa Gorge RWP	vOABC 58%, planning 42%	485 P1 346 P2	439 P1 131 P2	We note that the overall Stage 1 scheme costs were reduced significantly between the OABC and the vOABC, reducing from $750M to $380M (nominal) for Stage 1. This followed developer concerns at the	As scope efficiencies in Stage 1 are already almost 50%, it appears that cost efficiencies for this scheme are limited to	The main risk from deferral of the Stage 2 costs would be a potential delay on growth in the area. Options for managing this are limited given the

Project/ Program	Planning Status	Latest Project Cost 2026-2035 ($M Real)	Submitted IPART Cost ($M Real pre program level adjustment)*	Potential Scope Deferral /Reduction (can scope be removed or deferred from Period 1)	Potential Cost Efficiencies (can the remaining scope be delivered at a lower unit cost)	Notes and Associated Risks
				circa $200,000 cost per household at the OABC stage, and was achieved through reductions in network scope and by removing the need for reverse osmosis in the treatment stream, with non-potable recycled water only being treated to membrane bio-reactor (MBR) level. We note that the RWP is not planned to be operational until 2030, so could be slipped if growth is lower, or there are delivery issues. Under the SHSF growth forecast this would reduce P1 costs by 36% for the RWP, or $27M (based on $72M P50), and by around $45M under a low growth forecast. Stage 2 is intended for delivery in 2032, with transfer to the Upper Nepean works for demand beyond 2.1 Ml/d (beyond 4,500 lots). This is sensitive to the UGI growth layer, so could be deferred by 2-3 years (all cost effectively removed from Period 1), so assuming 3/5 of the $285M costs are currently in Period 1 this gives a potential deferral of $171M, or $125M above the cost reduction	standard default assumptions only.	isolated nature of the growth area.

Project/ Program	Planning Status	Latest Project Cost 2026-2035 ($M Real)	Submitted IPART Cost ($M Real pre program level adjustment)*	Potential Scope Deferral /Reduction (can scope be removed or deferred from Period 1)	Potential Cost Efficiencies (can the remaining scope be delivered at a lower unit cost)	Notes and Associated Risks
				assumed between Business Case and IPART costs.		
Upper Nepean AWRC	Planning/ OABC	1,199 P1 417 P2	721 P1 291 P2	There are large ($604M or 37%) scope reductions from the Business Case proposal to the figures used in the IPART submission. This is reflective of the fact that the scope proposed within the Business Case takes a risk averse position on treatment capacity needs, consenting and networks. However, this does mean that it is particularly difficult to assess what the scope is that is covered by the IPART expenditure. Treatment costs are circa 55% of the Period 1 costs according to the project forecasts, so to achieve the scope reductions included in the IPART forecasts would require delay in the Picton and Wilton (Bingarra) transfer pipelines. If these are fully deferred until Period 2 (2/3 of the pipeline costs) and ½ of the treatment costs are also deferred (in line with a staged approach), then savings of around 58% could be achieved from scope deferral. This	None identified above base assumptions	The main risk from deferral of costs beyond the IPART submission would be a potential delay on growth in the area. Options for managing this are limited given the isolated nature of the growth area.

Project/ Program	Planning Status	Latest Project Cost 2026-2035 ($M Real)	Submitted IPART Cost ($M Real pre program level adjustment)*	Potential Scope Deferral /Reduction (can scope be removed or deferred from Period 1)	Potential Cost Efficiencies (can the remaining scope be delivered at a lower unit cost)	Notes and Associated Risks
				equates to around 21% reduction beyond that already account for by Sydney Water.		
Greater Parramatta and Olympic Peninsula (GPOP -Camelia AWRC)	Land: DABC+ Design: OABC		Land 24 (most is in Period 0) Plant: 195 P1 287 P2	The land purchase element is complete. For the works, Sydney Water has proposed development in 2 stages, similar to the South Creek AWRC. The exact timing of need for the upgrade depends to a certain extent on the level of de-silting caried out on NSOOS, as this affects available capacity. The current proposal allows for de-silting down to 200mm depth; fully de-silting could extend the timeframe until circa 2040. Growth allowances are high, at just over 2.5% EP per annum. Stage 1 (15 Ml/d) is due for delivery in 2031. If growth is planned at SHSF levels then costs could be deferred by around $59M. If growth is delayed by 12 months beyond this then costs could be deferred by around $98m	Costs are reasonable in comparison to the outturn costs for the South Creek Phase 1 development, which is larger in terms of scale and scope.	

Project/ Program	Planning Status	Latest Project Cost 2026-2035 ($M Real)	Submitted IPART Cost ($M Real pre program level adjustment)*	Potential Scope Deferral /Reduction (can scope be removed or deferred from Period 1)	Potential Cost Efficiencies (can the remaining scope be delivered at a lower unit cost)	Notes and Associated Risks
North West Treatment Hub	Delivery	1,057 P1 78 P2	613 P1 581 P2	This is a mature program; the first tranche of work to upgrade Castle Hill and Rouse Hill WRRFs to comply with new treatment requirements is underway. Site mobilisation at Rouse Hill WRRF to upgrade capacity under budget 1 has also been initiated. The IPART submission includes 42% of forecast project cost ($444M) deferral to Period 2 and allows for only 10 Ml/d of the 20 Ml/d upgrade at Riverstone now considered to be required during Period 1. This projected capacity shortfall is the result of higher current growth forecasts compared to those at the time of the IPART submission. The scale of forecast high confidence growth in Period 1 combined with the new Hawkesbury Nepean Nutrient Framework load compliance limits at the treatment plants, to be imposed in mid-2025, mean that there is limited scope deferral related to the capacity upgrades.	A number of efficiency initiatives have already been implemented relating to operations, design changes and investment timing, amounting to at least $60M. These are assumed to have been factored into the existing cost estimate. Benchmarking analysis undertaken by an external supplier, as reported in the Sydney Water presentation, found that the Overall Liquids Stream Affordability Envelope for Budget 2 (liquid stream treatment capacity upgrade at Riverstone WRRF) sits at approximately P74. Previous outturn costs have been between P70 to P80 according to the presentation slides shared. Achieving P70 rather than P74 ($10.30M rather than $11.91M per Ml/d) equates to a potential efficiency saving of $16M	Delays to implementation of the gasification solution may risk Riverstone WRRF biosolids having no beneficial reuse option and requiring disposal to landfill, resulting in overall higher opex. Given the current state of scientific understanding regarding the risks of PFAS and other ‘forever chemicals’, and clear regulatory direction, it is likely that a solution will be required within Period 1. However, deferral could mean that there may be opportunities to further adjust the strategy and learn from the rollout of this technology and similar regulations elsewhere.

Project/ Program	Planning Status	Latest Project Cost 2026-2035 ($M Real)	Submitted IPART Cost ($M Real pre program level adjustment)*	Potential Scope Deferral /Reduction (can scope be removed or deferred from Period 1)	Potential Cost Efficiencies (can the remaining scope be delivered at a lower unit cost)	Notes and Associated Risks
				The IPART submission includes proactive implementation of gasification at Riverstone WRRF to address PFAS and other contaminants of concern as part of new biosolids requirements under the EPA guidelines, which are currently out for consultation. The IPART submission includes an allowance for the first stage of investment in this technology at Riverstone WRRF, to be delivered in 2027. [redacted] The RFI224 response indicates that construction relating to budget 1 and 2 will be complete in FY29. Growth forecasts are sensitive to the UGI growth layer, so should growth align more closely with the SHSF, investment could potentially be delayed by around 18 months. This would equate to a potential further	($1.61M x 10 Ml/d upgrade for Riverstone WRRF).	

Project/ Program	Planning Status	Latest Project Cost 2026-2035 ($M Real)	Submitted IPART Cost ($M Real pre program level adjustment)*	Potential Scope Deferral /Reduction (can scope be removed or deferred from Period 1)	Potential Cost Efficiencies (can the remaining scope be delivered at a lower unit cost)	Notes and Associated Risks
				deferral of $88M (17% of $613M-$85M) to Period 2. With a 30 month delay, this would result in a deferral of $264M into Period 2.		
Northwest Growth Area & Metro North West Servicing Program	NABC	350 P1 193 P2	281 P1 278 P2	The NABC (p.20) states that the program supports a proactive response to growth within a significant growth area. It includes a series of potential investments to upgrade asset capacities and address capacity constraints for reservoirs and trunk mains in the Oakville Water Supply Zone. This program is in the options development phase and therefore scope and costs have a relatively low level of certainty. This means that it is challenging at this stage to determine the potential scope deferral. The IPART submission includes a deferral of 20% of Period 1 costs to Period 2 ($68M investment deferred). Urgent investments at Oakville and SP1154 (needed for 2026-28) have been prioritised. No funding has been allowed for accelerated growth at Kellyville and	None identified	Sydney Water considers the consequences of delaying investment in the program to be high, including an inability to service growth, EPL non-compliances and risks to waterway contamination.

Project/ Program	Planning Status	Latest Project Cost 2026-2035 ($M Real)	Submitted IPART Cost ($M Real pre program level adjustment)*	Potential Scope Deferral /Reduction (can scope be removed or deferred from Period 1)	Potential Cost Efficiencies (can the remaining scope be delivered at a lower unit cost)	Notes and Associated Risks
				Bella Vista stations Transport Oriented Development (TOD) as these were announced after the IPART submission. Construction will be complete by 2031, excluding the Oakville Water Supply Zone works which are considered by Sydney Water to be more urgent and will be completed by 2028. Growth forecasts are sensitive to the UGI growth layer, so if growth aligns more closely with the SHSF, investment could potentially be deferred by 18 months. Excluding $83M for Oakville which would already have been delivered during Period 1, this equates to a deferral of $59M of costs to Period 2 With a 30 month delay, this would result in a deferral of $99M into Period 2.		
Malabar Near Term Works	Glenfield (Package 1) and Liverpool (Package 2) WRRF Upgrades: Alliance development / procurement	Glenfield WRRF Upgrade: 399 P1	Glenfield WRRF Upgrade: 376 P1	This is a mature program, and there is limited opportunity for scope reduction given current capacity constraints, existing odour issues and non-compliance of the Malabar system in terms of its wet weather	None identified. Sydney Water has reported that the Liverpool, Glenfield and Fairfield upgrades are bespoke and designed to maximise capabilities of	Sydney Water considers the consequences of delaying investment in the program to be very high, including an inability to service growth, EPL non-compliances, risks to

Project/ Program	Planning Status	Latest Project Cost 2026-2035 ($M Real)	Submitted IPART Cost ($M Real pre program level adjustment)*	Potential Scope Deferral /Reduction (can scope be removed or deferred from Period 1)	Potential Cost Efficiencies (can the remaining scope be delivered at a lower unit cost)	Notes and Associated Risks
	Fairfield WWTP Upgrade Package 3): Delivery North Georges River Submain (NGRS) / Aquanet (Package 4b): Delivery Liverpool to Ashfield Pipeline (LAP) Extension (Package 4a): OABC	0 P2 Liverpool WRRF Upgrade: 414 P1 0 P2 NGRS/LAP Capacity 92 P1 0 P2 Fairfield WRRF Upgrade:	0 P2 Liverpool WRRF Upgrade: 407 P1 0 P2 NGRS/LAP Capacity 118 P1 0 P2 Fairfield WRRF Upgrade: 15 P1	performance. In line with this, Sydney Water has not deferred any investment to Period 2 under the IPART submission. It is noted that the Glenfield upgrades will provide capacity to meet mid-2030s treatment demands[28], and the Liverpool WRRF Upgrade will service growth to 2036[29]. The Glenfield and Liverpool WRRF upgrades, along with the LAP extension project, are programmed for completion in mid-2029, with Fairfield odour management and the NGRS/Aquanet works due for completion in 2026. The growth forecasts are sensitive to the UGI growth layer, so the Glenfield and Liverpool WRRF upgrades along with the LAP extension could potentially be deferred by 18 months if growth	existing assets, so benchmarking against schemes already delivered is not practicable. An independent estimator has been commissioned to validate project cost estimates and following the completion of the current procurement exercise, further efficiencies may be identified (RFI 261).	water quality and increased odour issues and complaints.

[28] The presentation provided by Sydney Water stated that the upgrades would service growth to 2046, but Sydney Water stated in their response to RFI 250 that the capacity upgrades would provide *'just enough capacity for the mid-2030s'* and that there are no opportunities for further staging.
[29] The presentation provided by Sydney Water stated that upgrades would service growth to 2046, but the RFI 250 response stated that *'the DABC was in error stating that capacity is provided to 2046'*.

Project/ Program	Planning Status	Latest Project Cost 2026-2035 ($M Real)	Submitted IPART Cost ($M Real pre program level adjustment)*	Potential Scope Deferral /Reduction (can scope be removed or deferred from Period 1)	Potential Cost Efficiencies (can the remaining scope be delivered at a lower unit cost)	Notes and Associated Risks
		29 P1 0 P2	0 P2	more closely aligns with the SHSF, equating to a $150M deferral to Period 2. With a 30 month delay, this would result in a deferral of $451M into Period 2.		
Malabar Mid Term Works	NABC	1,192 P1 826 P2	213 P1 411 P2	Whilst the Malabar Near Term program focuses on immediate needs relating to growth and compliance, the Mid Term program is focused on addressing capacity constraints for transferring wastewater via the Suburbs Ocean Outfall Sewer (SWSOOS), which is forecast to reach dry weather capacity in 2032 (originally forecast to be 2028 at SBC stage). Three strategic options are currently under consideration, with total capex ranging from approximately $2.1-$2.7Bn. 82% of total project forecast costs have already been deferred to Period 2. Given that the investment is not required until 2032 based on current growth forecasts, there is potential for further deferral of investment by 18 months if growth is limited to the SHSF. This equates to	None identified due to the existing scale of deferral beyond Period 1 and the early planning status of this program.	The Malabar wastewater system currently services over a third of Sydney's population. Further investment deferral creates a risk that the company will not be able to service growth in this area, if it is faster than the SHSF.

Project/ Program	Planning Status	Latest Project Cost 2026-2035 ($M Real)	Submitted IPART Cost ($M Real pre program level adjustment)*	Potential Scope Deferral /Reduction (can scope be removed or deferred from Period 1)	Potential Cost Efficiencies (can the remaining scope be delivered at a lower unit cost)	Notes and Associated Risks
				a potential deferral of $107M above the expenditure deferral already assumed between the latest project forecast and IPART costs. With a 30 month delay, this would result in a deferral $178M into Period 2.		
Illawara Wastewater Treatment Plants	Problem Definition / Options Assessment	[redacted] [redacted]	[redacted] [redacted]	Current high confidence growth projections indicate that both Wollongong and Shellharbour WRRFs will reach capacity around 2027-28. Several options are currently being explored, with others discounted due to high capex and long lead-in times. Completion of current preferred options is currently forecast to be 2033, based on what is thought to be achievable (construction is forecast to start in 2027-28 and estimated to take 4-6 years in the latest options report). [redacted] We note that the design forecast year is 2056 for both plants, so there may be	No specific efficiencies identified due to the existing scale of deferral beyond Period 1 and the early planning status of this program. Sydney Water reported that benchmarking is challenging for this program due to the bespoke nature of the designs (RFI 261).	Wollongong expansion in particular carries significant delivery risks related to space constraints within the existing site boundary, and the potential need to use [redacted] The Wollongong and Shellharbour options report also notes that the anticipated change in NSW EPA biosolids guidelines could affect the options available for biosolids disposal at both sites (particularly Wollongong), although the risk has been assessed as low at present and potentially only being

Project/ Program	Planning Status	Latest Project Cost 2026-2035 ($M Real)	Submitted IPART Cost ($M Real pre program level adjustment)*	Potential Scope Deferral /Reduction (can scope be removed or deferred from Period 1)	Potential Cost Efficiencies (can the remaining scope be delivered at a lower unit cost)	Notes and Associated Risks
				opportunities for further staging. However, although growth and need forecasts are sensitive to the UGI growth layer, even if growth is limited to the SHSF the upgrades are still likely to be required by the end of Period 1. Therefore opportunities for further scope reduction or investment deferral are likely to be limited, and we have suggested a default 13% expenditure deferral in line with the existing program level adjustment. With a 30 month delay, this would result in a deferral of [redacted] into Period 2.		realised around 2036. Thermal sludge treatment has not therefore been included in the current scope and costs, with the view that this will be adapted as needed.
Greater Penrith to Eastern Creek (GPEC) and Orchard Hills	Planning, with several projects in the design and delivery phases such as St Marys WRRF commissioning and upgrade and Penrith CBD wastewater network amplification	1,005 P1 380 P2	741 P1 435 P2	The GPEC investment program is at an early stage and is still being developed, although there are several elements that are at a more advanced stage. Growth in the area is a combination of greenfield and urban centre renewal/densification. Growth in this area has been significantly higher than forecast at the previous IPART submission and the implementation of the Hawkesbury Nepean Framework	None identified	Further deferral of investment creates a risk that the company will not be able to service growth in this area and/or is non-compliant with the Hawkesbury Nepean load caps, if growth exceeds the SHSF.

Project/ Program	Planning Status	Latest Project Cost 2026-2035 ($M Real)	Submitted IPART Cost ($M Real pre program level adjustment)*	Potential Scope Deferral /Reduction (can scope be removed or deferred from Period 1)	Potential Cost Efficiencies (can the remaining scope be delivered at a lower unit cost)	Notes and Associated Risks
				requires upgrades at several WRRFs to achieve compliance. 26% ($264M) of the current total project forecast has already been deferred to Period 2. Sydney Water is forecasting a population increase within the Orchard Hills precinct of 7,000 by 2030 and 16,000 by 2033 (RFI 255), indicating an acceleration of growth in Period 2. The growth forecasts are sensitive to the UGI growth layer, so the works could potentially be deferred by 18 months. This equates to a deferral of $159M, assuming an original construction timeline from 2026-2033. With a 30 month delay, this would result in a deferral of $265M into Period 2.		
Water Pump Station No. 200 ('WP200')	Problem Definition / Options Assessment	1024 P1 849 P2	310 P1 411 P2	Sydney Water's analysis has shown that some of the major reservoirs within the Prospect North Delivery system are projected to breach their reserve storage levels under 2031-32 demand conditions. The latest project forecast for options to address these capacity constraints are in the range of $780M to $1.56Bn (RFI 206). The	None identified, due to the relatively early planning stage.	A significant proportion of costs have already been deferred to Period 2. Further cost deferral creates a risk that the company will not be able to service growth in this area, if it exceeds the SHSF.

Project/ Program	Planning Status	Latest Project Cost 2026-2035 ($M Real)	Submitted IPART Cost ($M Real pre program level adjustment)*	Potential Scope Deferral /Reduction (can scope be removed or deferred from Period 1)	Potential Cost Efficiencies (can the remaining scope be delivered at a lower unit cost)	Notes and Associated Risks
				interim solutions to service growth prior to 2031-32 have been progressed as separate projects. 70% of the latest project forecast costs (September 2024) have already been deferred beyond Period 1 as part of the IPART submission. The growth forecasts are sensitive to the UGI growth layer, so an 18 month delay would equate to a potential deferral of $116M (original construction timeline assumed to be 2028-2032) if growth more closely aligns with the SHSF. With a 30 month delay, this would result in a deferral of all $194M into Period 2.		

***for Period 1 (P1 – 2026-30) and Period 2 (P2 – 2031-35)**

4.5.7 Our view

In determining our view of the range of growth related capex that is prudent and efficient, we have used the analyses provided in the previous sections to derive three categories of expenditure. The first highlights projects or scope that we consider is either not well justified or could likely be deferred entirely out of Period 1. We then present an upper and lower range total capex scenario.

Aerotropolis/Mamre Rd Stormwater and RRWS programs

For the Aerotropolis/Mamre Rd Stormwater and RRWS programs our upper range assessments are effectively equal to the Sydney Water proposal minus the 'not strongly justified' expenditure. The lower range assessments then incorporate 'stretch' deferrals and efficiencies as described in Sections 4.5.4 and 4.5.5 above. These are set out below.

Table 4-10 – Range of expenditure for RRWS[30]

	Sydney Water proposal	Not strongly justified this period	Upper range	Lower range
Approach	The approach is based on the avoidance of Level 5 restrictions to the 1 in 100,00 level and the reduction of single point of failure risk in the strategic water supply system.	SDP network expansion - most of the capacity (all capacity outside or Level 3 drought restrictions and 450 Ml/d out of the 500 Ml/d total expanded SDP capacity under Level 3 restrictions) can be utilised with the existing network before Level 5 restrictions	Include all PRW proposals but defer the SDP network expansion.	Exclude all but the Quakers Hill Phase 1 PRW expenditure from Period 1. The other plants are re-scheduled for expenditure beyond Period 1.
Expenditure (pre-efficiency challenge)	$1,306M	$828M	$478M	$431M
Risks	The best approach to network reconfiguration to accommodate the SDP expansion will depend on exactly where growth occurs. The proposal may not	Very limited in terms of water resources – Sydney Water calculations show the risk of a L5 failure only increases from 1 in 10,000 years to 1 in 8.000 years,	Very limited – see left for risks if the SDP network expansion is not	Increased risk that cannot be fully quantified without additional modelling, but overall risks of Level 5 restrictions remain extremely

[30] These represent the figures before the Sydney Water portfolio level adjustment. To allow for this, in the final view of SIR adjustments described in Section 4.10 uses the absolute difference between the Sydney Water proposals and our upper & lower ranges, and multiplies this by 90% to allow for the fact that Sydney Water has already carried out a 10% reduction compared with the CIOP Business Case.

	Sydney Water proposal	Not strongly justified this period	Upper range	Lower range
	therefore be the most efficient.	without the PRW plant. Existing single points of failure in treatment and distribution will remain, and if unexpected events occur there will be a lower proportion of rainfall independent supplies.		low, still at well over 1 in 10,000 years
Advantages	The program is completely aligned with the GSWS and promotes a rapid increase in rainfall independent supplies. It also reduces single point of failure risks in the strategic network.	The program contains the PRW and SDP water source options, so fulfils the need for rainfall independent supplies, whilst only marginally increasing the risk compared to the Sydney Water proposals	The program contains the PRW and SDP water source options, so fulfils the need for rainfall independent supplies, whilst only marginally increasing the risk compared to the Sydney Water proposals	Lowest cost to customers.

Source: Analysis of CIOP and Business Cases

Table 4-11 - Range of expenditure for Aerotropolis

	Sydney Water proposal	Not strongly justified this period	Upper range	Lower range
Approach	'Bottom up' analyses of infrastructure and land costs based on storage and area runoff calculations. The methodology has been reviewed in detail for Mamre Rd by IPART.	Sydney Water has reviewed the costs and reduced them to an aggregated $922M in Period 1.	Use the Sydney Water updated costs and also include the IPART recommended retention/storage reductions for Mamre Road (-$62M)	Assume cheaper land costs for Aerotropolis, at halfway between the Sydney Water Aerotropolis and Mamre Rd allowances (additional -$30M).
Expenditure(pre-efficiency challenge)	$1,436M	$514M	$860M	$830M
Risks	Costs are likely to be higher than developer contributions (see Section 4.5.8), so there will be a net impact on Sydney Water customers in the long term.	Limited – uses Sydney Water's own assessment	Not significant – uses Sydney Water's own assessment plus the IPART deep dive review. There is some risk that assumed retention basin size could be too small.	Land costs are currently uncertain and a lack of funding could put pressure on the planned engineering scope, resulting in constraints on growth in Aerotropolis.
Advantages	All reasonable growth is enabled and accommodated as a deliverable cost under this proposal.		Lower cost to developers and stronger incentive for value engineering	Lowest cost to developers and an incentive to try and reduce basin land costs through location and negotiation.

Source: Analysis of SIR Capex 2, RFI165/166, CIOP and Business Cases

The reductions that we have applied to the SIR need to account for the portfolio level efficiency adjustments that Sydney Water has applied to the above projects, which are around 10% for water growth in Period 1, and 9% for wastewater growth. The final negative adjustments we have applied to the projects in Section 4.10 are as shown below.

Table 4-12 – Net Period 1 Expenditure Adjustments Applied to SIR for RRWS and Aerotropolis/Mamre Rd

Project	Cost Attribute	Adjustment for upper scenario ($M)	Adjustment for lower scenario ($M)
RRWS	Gross saving before SWC portfolio adjustment	(828)	(875)
	Net saving taking account of SWC adjustment	**(745)**	**(788)**
Aerotropolis /Mamre Rd	Gross saving before SWC portfolio adjustment	(576)	(606)
	Net saving taking account of SWC adjustment	**(518)**	**(545)**

Source: AtkinsRéalis analysis

Other growth capex

For the remainder of the growth capex we cannot present such an 'additive' view because Sydney Water has applied the overarching program and portfolio level adjustments that cannot be attributed to individual projects within a given area. It is not possible, for example, to simply assume that the upper range forecast is equal to the Sydney Water proposals minus those expenditure items that are not strongly justified in the period, as the Sydney Water program level adjustments would inherently include some of that deferral. The remaining growth expenditure ranges have therefore been taken as follows:

1) The 'upper' scenario is based on the 7.9% to 12% savings beyond those assumed by Sydney Water, and reflects the 'top down' and 'bottom up' analysis of cost run rate and SHSF growth, as described earlier. Because there was some discrepancy between the figures provided to us in the presentation (see Section 4.5.6) and the Infrastructure Capital Investment Overview (ICIO) document, we have taken the lower bound of this range (7.9%) and applied it to the lower (ICIO) capex figure. Our upper range allowance therefore only carries a slightly increased level of risk to causing constraints on growth in comparison to the Sydney Water proposals.

2) The 'lower' scenario has been taken from our detailed analysis described in Section 4.5.6, where we estimate that further deferral of scheme costs would represent a stretch reduction of another 10%, resulting in a net allowance of $6.38Bn.

This lower bound can either reflect a scenario where growth is delayed by 12 months from the SHSF, or other scenarios that lead to deferral of cost, such as delays to procurement and delivery that could result from the size and relative complexity of the capital program, and the supply chain constraints within NSW (see Section 4.10.3 below).

Our lower scenario therefore reflects a range of factors (i.e. slower growth or program delays) that could serve to reduce costs to customers.

Table 4-13 – Expenditure range for growth (excluding Aerotropolis and RRWS)

	Sydney Water proposal	Not strongly justified this period	Upper range	Lower range
Approach	Figure taken from the ICIO. Based on 'high confidence' growth forecasts in the near term, with allowances for strategic enablers of growth outside of the high confidence areas.	Various strategic schemes linked to later growth (i.e. schemes to address constraints that arise after 2029) and the difference between the Sydney Water high confidence growth rate and the SHSF growth forecast.	Rate of spend 10% lower than the ICIO figure	10% 'stretch' reduction beyond the Upper range scenario, driven by an average 12 months deferral of costs.
Expenditure (pre-efficiency challenge)	$8,325M	9% of cost, nominally separated into $298M specific schemes + $474M further growth deferral[31]	$7,575M	$6,441M

[31] Because of the way that Sydney Water has applied a 'top down' program level adjustment to its business cases, our analysis has had to be carried out 'in the round' to evaluate how much stretch beyond this top down adjustment we think should be made to reach our upper scenario. Our adjustments were evaluated from the Business Cases before the 'top down' Sydney Water program adjustment, and include specific scheme deferrals due to a lack of strong justification, potential deferrals due to lower growth rates and specific delivery efficiencies beyond those assumed by Sydney Water in their second level of 'top down' 'portfolio' adjustments (which are contained separately in the SIR). Therefore, although we have shown the level of specific scheme adjustments in the table, in reality the 'further growth deferral' is effectively just a balancing figure that reconciles the total difference between our 'in the round' analysis of reasonable growth requirements and the Sydney Water program level adjustments. The low growth scenario then incorporates the difference this scenario, which assumes SHSF growth and our assumed lower growth rate.

	Sydney Water proposal	Not strongly justified this period	Upper range	Lower range
Risks		Some risk of localised constraints on growth of Sydney Water is not able to adapt and change its investment to meet ‘hotspots’ of growth.	Some risk of localised constraints on growth of Sydney Water is not able to adapt and change its investment to meet ‘hotspots’ of growth. Some potential for inefficient expenditure, particularly on strategic connections.	Potentially a constraint on housing growth, and would require careful management of key strategic assets, as flows could be marginally greater than the nominal estimates of capacity.
Advantages	Very low risk of Sydney Water being a constraint on growth, even if it is higher than SHSF in the near term.	N/A	Sydney Water unlikely to be a constraint on housing growth at a regional level	Minimum bill impact. Strategic schemes can be optimised depending on where growth occurs.

Source: Analysis of Sydney Water Infrastructure Capital Investment Overview

(Note – all figures are taken from or equivalent to those presented in the Sydney Water Infrastructure Capital Investment Overview– see below for the translation to impacts on the SIR)

The figures presented above are consistent with the Sydney Water Infrastructure Capital Investment Overview (ICIO), rather than the SIR. This is because the top down program level adjustments are only visible in that report, and what we have effectively done in the table above is examined the reasonable stretch beyond that ‘top down’ adjustment.

In order to generate the final capex adjustments we have calculated the absolute differences in the above table as percentage impacts and then applied these to the SIR tables. We have split out the delivery efficiency numbers from the scope deferral numbers as required for our SIR adjustments. A summary of the calculations used in the SIR tables is provided in Table 4-14 below.

Table 4-14 – Growth Expenditure (net of Mamre/Aerotropolis and RRWS) Adjustments Made to the SIR

Adjustment	Percentage Impact on SWC Figures Quoted in the ICIO report	SIR Total Period 1 Capex (water $M)	Cost Adjustment (Period 1) (water $M)	SIR Total Period 1 Capex (wastewater $M)	Cost Adjustment (Period 1) (wastewater $M)
Total Adjustment for Upper Scenario	9%	4,069	(367)	5,952	(536)
Allocated to scope	*8%*	*4,069*	*(326)*	*5,952*	*(477)*
Allocated to efficiency (beyond SWC portfolio adjustment)	*2%*	*4,069*	*(61)*	*5,952*	*(89)*
Gross adjustment for Lower Scenario	23%	4,069	(936)	5,952	(1,369)
Allocated to 'other adjustments ' (change from upper to lower growth)	*14%*	*4,069*	*(569)*	*5,952*	*(833)*

Source: AtkinsRéalis analysis. Note figures may not sum due to rounding

4.5.8 Infrastructure Contributions

The costs shown above represent the gross expenditure planned in the submission. We understand that infrastructure contributions were re-introduced in FY25 (at 25% of the allowance) and are to increase to 100% of the allowance from FY27 onwards to help fund growth. There are two major sources of these contributions:

1) Developer contributions for individual development areas, intended to offset water and wastewater servicing costs.

2) Contributions to Mamre and Aerotropolis stormwater management.

The existing assumed relative contributions from growth other than Mamre/Aerotropolis are provided in Table 4-15 below.

Table 4-15 – Expected Infrastructure Contributions, Excluding Mamre Rd/Aerotropolis ($M)

FY	Wastewater	Water
26	$94	$32
27	$185	$68
28	$189	$67
29	$209	$112
30	$201	$168
Total P1	**$878**	**$447**

Source: Analysis of RFI165

This equates to around 14% of growth capex. These figures will change if the scenarios proposed within this chapter are adopted for the price review. Although the alternate growth capex scenarios in chapter 4 would only have an effect on revenue from Infrastructure contributions from 1 January 2029 onwards, or the final 18 months of the determination. This is because the individual charges have already been registered with IPART and are not due to be updated until the end of calendar year 2028. There is no obligation to update the prices based on the outcomes of the retail price determination.

For Aerotropolis/Mamre Road, the basic principle is one of cost recovery from developers. Currently the proposed costs are equivalent to the IPART submission, and do not reflect the updated figures presented in Section 4.5.7. Given the Sydney Water proposed reductions in cost and our associated upper range scenario that is only 60% of the IPART submission, we would anticipate that the cost per hectare for Aerotropolis would logically be expected to reduce by around 40%.

It should be noted that developers will also be carrying out ‘on lot’ connections and flood runoff retention works, but these are not reflected in the Sydney Water capex proposals, so do not need to be considered in the IPART assessment.

4.6 Renewals

4.6.1 Overview

Sydney Water’s price proposal incorporates a 55% real terms increase in renewals capex, amounting to a total program of $5,508M. The business makes the point that this increase is driven by assets coming to the end of life for the first time, saying[32]:

> *Significant portions of our assets are coming to end of service life, with potential to move to more burdensome operational and capital states, or other risks to be realised if not addressed.*
>
> *Many assets reaching end of life are doing so for the first time, and require more complex renewal (e.g. obsolescence, escalating expectations for reliability & safety, heritage requirements).*

It makes the point that reliable assets and performance are key in the context of growth.

Wastewater renewals capex is the largest component of both historical and proposed expenditure followed by water. Stormwater renewals are projected to increase in the next period. All corporate capex are categorised as renewals and are examined separately in Section 4.7.

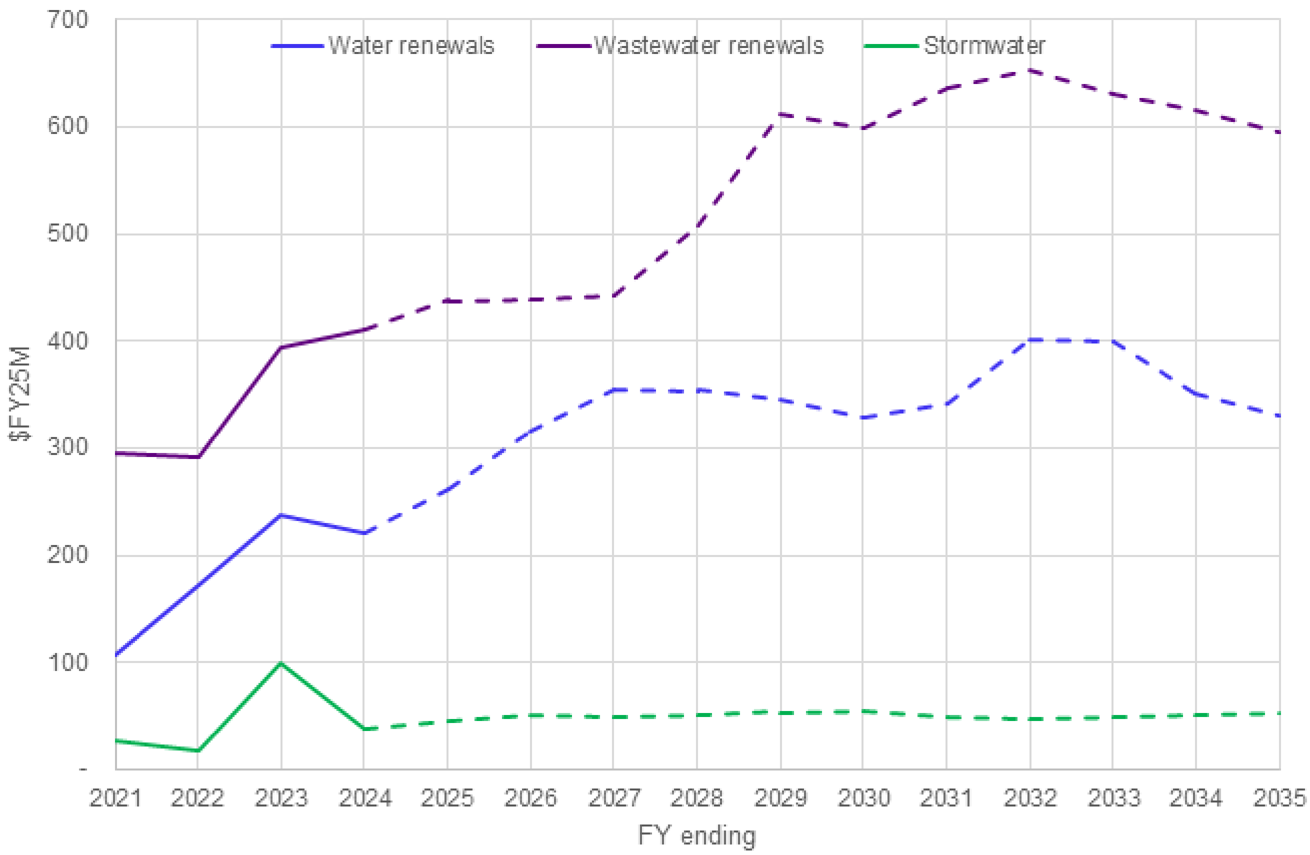
[32] Sydney Water presentation 3C

Table 4-16 – Comparison of historical and projected renewals by service ($FY25M p.a.)

Category	FY21 to 24 average (actuals)	FY24 actuals	FY25 forecast	FY26-30 projection	Difference from FY21 to 24 actuals	
Wastewater	347	410	438	520	172	50%
Water	184	220	261	340	155	84%
Corporate	134	145	207	189	55	41%
Stormwater	46	39	46	52	7	14%
Total	**712**	**814**	**952**	**1,102**	**390**	**55%**

Source: Analysis of AIR/SIR

Figure 4-19 – Proposed renewals by service



Source: Analysis of AIR/SIR

The largest ten programs or initiatives (i.e. those >$200M) listed in the SIR make up $4.639M or 84% of the proposed renewals expenditure in FY26-30[33]. These are:

- Wastewater Treatment Plant Renewals: $1,250M;
- Critical Sewer: $1,116M;

[33] Note that these and all other program costs do not take account of the effects of portfolio adjustments which are applied as a separate stand-alone line in the submission

- Water Filtration Plant Renewals: $545M;
- Water Reservoir Renewals: $305M;
- Water Metering: $292M;
- Stormwater Renewals: $248M;
- Critical Watermain Renewals: $240M;
- Workplace Accom. Program – Operational: $234M (covered under Corporate capex below);
- Reticulation Watermains Renewals: $207M;
- Reticulation Sewer: $203M.

We review all of these except watermains and reticulation sewers below.

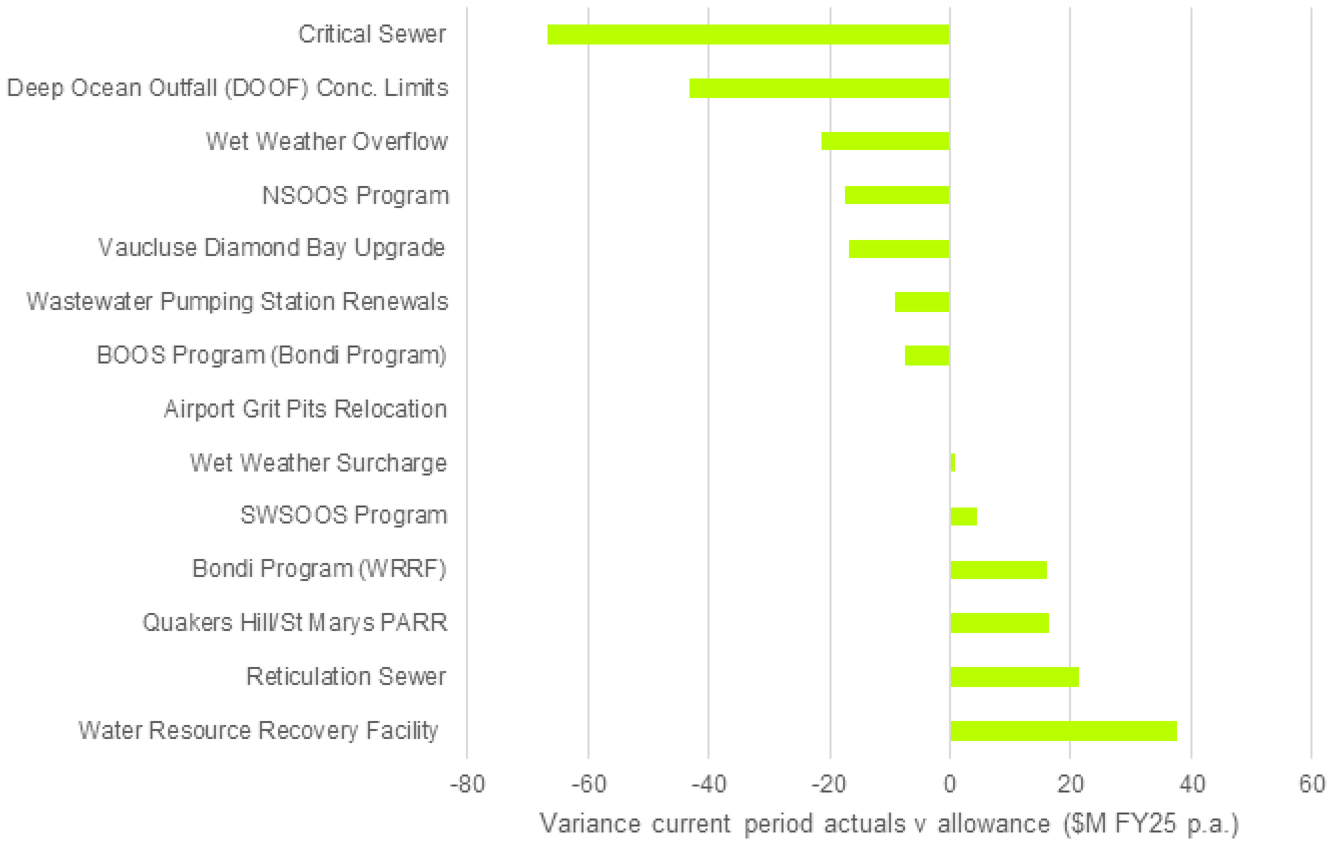
The business has applied a $270M (9%) portfolio reduction to its proposed wastewater renewals program, reducing it from $2,869M to $2,598M. It has also applied a $152M (8%) downward adjustment to water renewals, reducing it from $1,852M to $1,700M. No adjustment has been applied to stormwater or corporate renewals.

We have discussed the business's approach to asset management, risk and renewals in Section 2.3.2 and performance across a number of metrics in Section 3. In the following sections we discuss proposed renewals expenditure by service and corporate costs.

4.6.2 Wastewater

As highlighted in Sydney Water's assessment of the variance in the 2020 Determination period, summarised in Section 4.2, delays in critical sewer renewals and NSOOS, and successful negotiation of the DOOF program have led to underspend in some areas, partially offset by increases in water resource recovery facility renewals for example. Overall this led to spend $84M or 18% below the allowance.

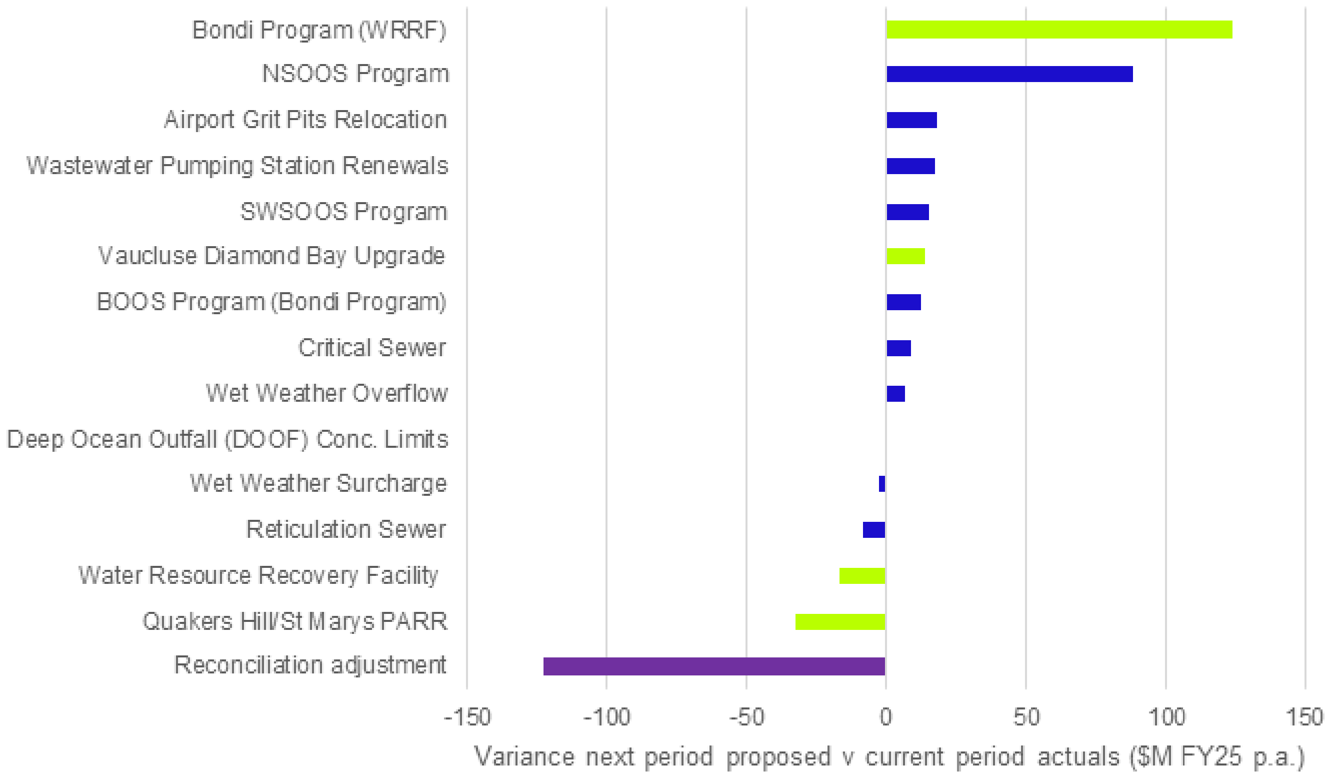
Figure 4-20 – Variance between wastewater renewals allowance and expenditure in the 2020 Determination period



Source: Analysis of RFI96

The business has proposed a significant increase in expenditure for the FY26 to FY30 period, $172Mp.a. or 50% higher than wastewater renewals spend in FY20 to FY24 (after adjustments). The increase is mainly driven by two programs: Bondi WRRF and NSOOS as can be seen below. These two programs are examined below.

Figure 4-21 – Difference between proposed and 2020 Determination period WW renewals spend by program/initiative



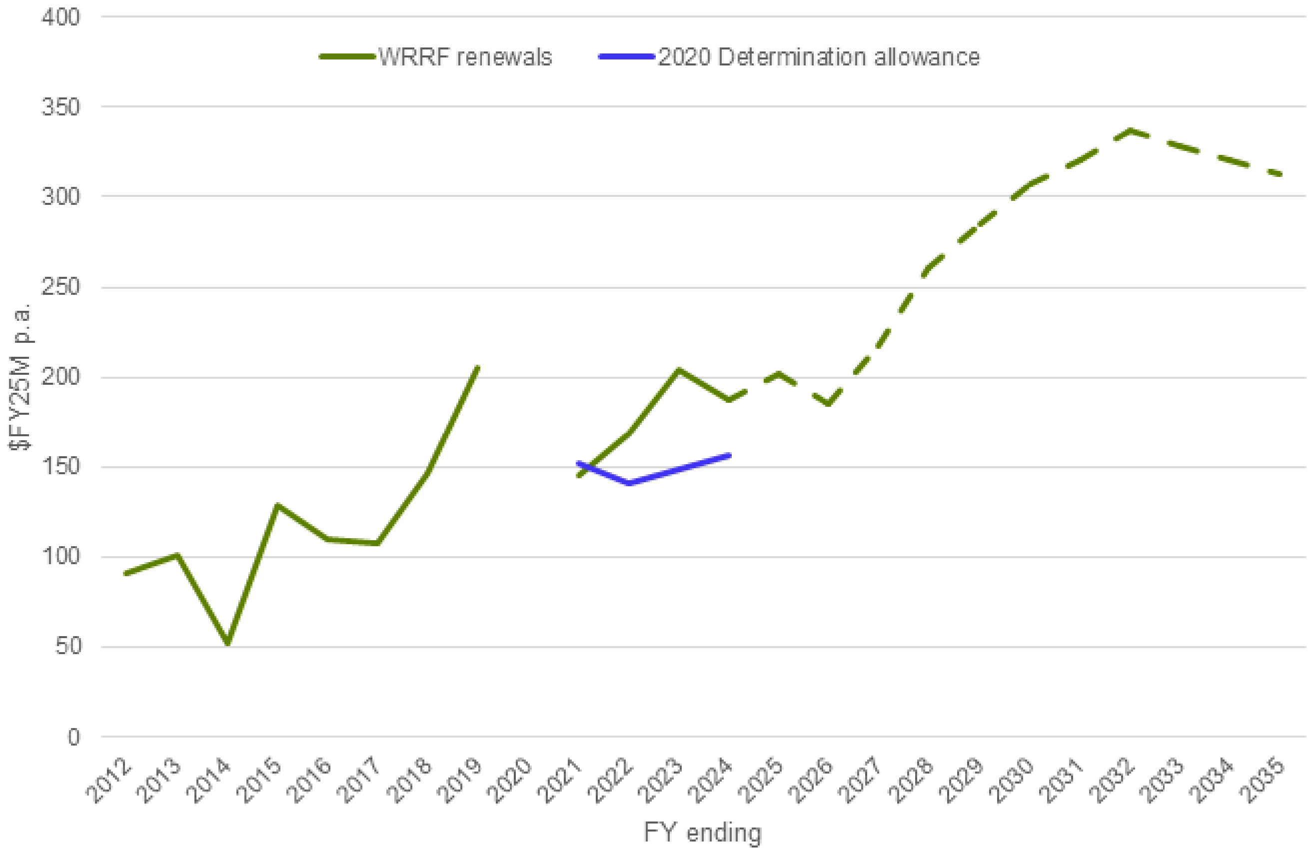
NB: blue=network. Green=facilities.
NB2: 'reconciliation adjustment' is the difference between the expenditure by program/initiative in RFI96 and the total wastewater renewals expenditure in the SIR. It is assumed to represent the net effects of the adjustments applied by the business between the derivation of the costs in RFI96 and the SIR submission. The proposed expenditure by program/initiative does not incorporate the effects of these adjustments[34].
Source: Analysis of RFI96

4.6.2.1 WRRF renewals

Sydney Water has spent more than the assumptions in the 2020 Determination allowance and is proposing to increase expenditure further especially in the period after 2026 largely driven by increased expenditure on the Bondi Program which is discussed in further detail below.

[34] Sydney Water has provided a summary of program adjustments in 'RFI 138, 139, 140 and 143'. However, it is hard to fully map the adjustments to programs/initiatives as some of them are called 'other' or 'level 2 filtering'. The difference between RFI 96 renewals expenditure figures and SIR Capex renewals is more than just the portfolio adjustment (as can be seen by the scale of the reconciliation adjustment) but not as big as the program adjustments. We have therefore used the reconciliation adjustment to reconcile the two data sets and allow us to present expenditure at program/initiative level as well as in aggregate.

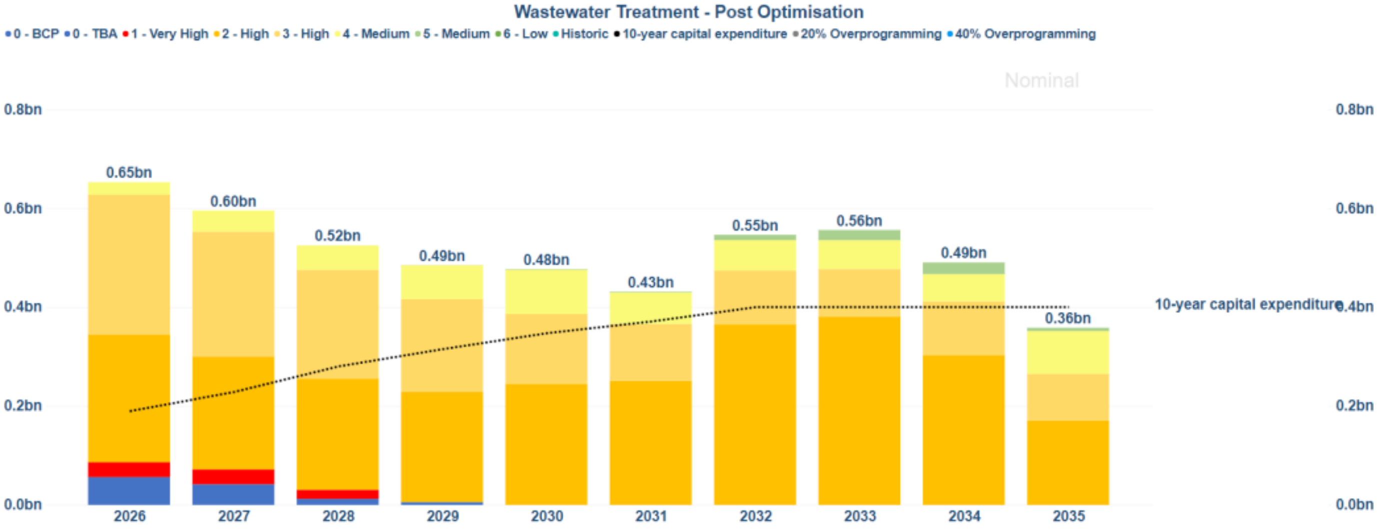
Figure 4-22 – WRRF renewals expenditure



Source: analysis of RFI96 and 2020 AIRSIR.
NB: expenditure from FY25 onwards is purely based on the RFI96 expenditure figures and does not incorporate the effects of the reconciliation adjustment which has not been allocated to renewals types.
NB2: FY12 to FY19 figures are based on all 'existing mandatory standards' spend on WWTPs. We do not have this information for FY20

The business has used the process outlined in Section 2.3.2 to assess the current and future risk of its assets and derive an unconstrained needs investment. It has then applied adjustments, judging that *"The unconstrained need across our entire asset base exceeds what we and the market can achieve within the 2025-26 to 2029-30 period"*. For WRRF the proposed expenditure appears to be approximately sufficient to renew all 'very high' and 'high 2' assets in Period 1.

Figure 4-23 – WRRF asset risk levels and renewals expenditure



Source: Figure 3, Water Resource Recovery Facility Renewals Program Investment Plan 2025.

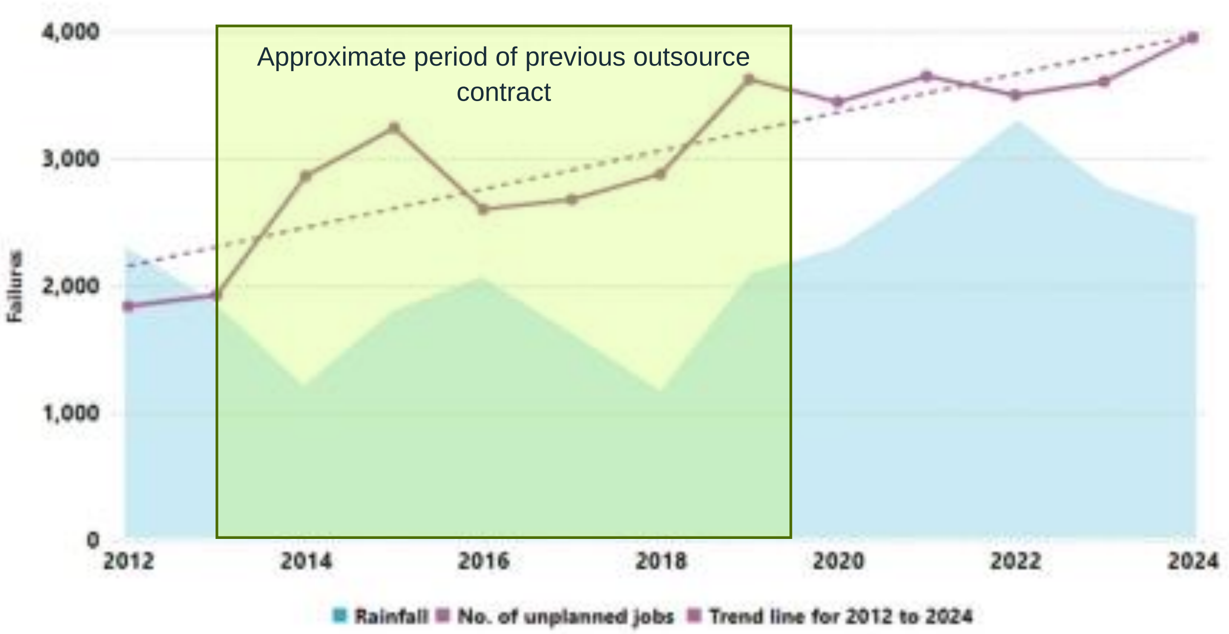
We have commented on the potential challenges with the risk based approach in Section 2.3.2 (e.g. lack of clear decision criterion, appropriateness of the scores and applicability to renewals).

The business has provided a summary of unplanned jobs (assumed to be reactive work orders) by year as reproduced below. This suggests that there was an increase from FY13 to FY15 (at the start of the outsourced maintenance contract), then a step up from FY18 to FY19. After FY19 job numbers are more stable with an increase in FY24. We note the business's explanation that the increase in FY19 failures was due to the outsourced maintenance provider not performing planned maintenance as the contract was coming to an end[35].

However, we note that these are 'raw' numbers (i.e. they don't take account of number of assets over time especially as assets such as co-digestion plants are installed and become older) and an increase in reactive work orders can sometimes be the result of a change in policy or approach (e.g. a switch from a proactive to reactive approach or classification/data capture changes).

[35] Sydney Water RFI 79, 84, 98, 99, 100, 103, 130, 135, 141, 142, 199

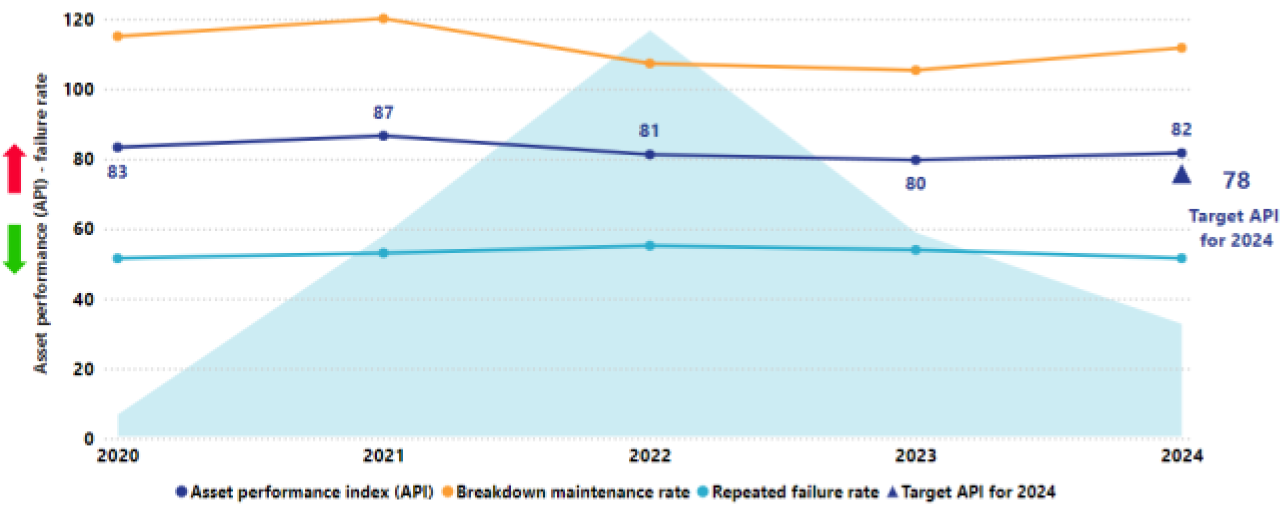
Figure 4-24 – WRRF unplanned jobs by year



Source: Figure 5, RFI 79, 84, 98, 99, 100, 103, 130, 135, 141, 142, 199

The 2024 State of the Assets report classifies WRRF asset performance as stable in FY22, FY23, and FY24[36]. This is supported by breakdown maintenance rate and repeat failures as shown below.

Figure 4-25 – WRRF asset performance

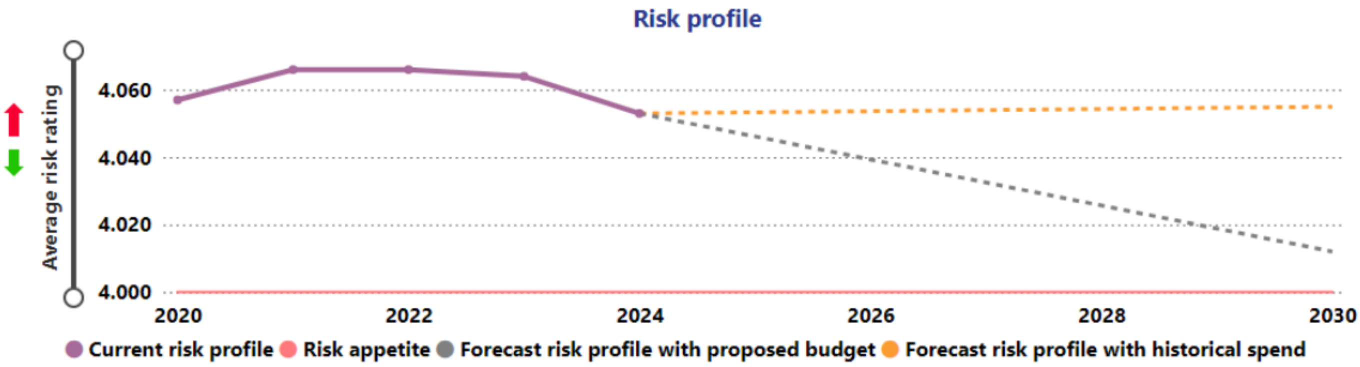


Source: State of the Assets Report FY24

The business has provided a projection of improving risk with the proposed budget:

[36] Ref: Table 7 of State of the Assets Report FY24

Figure 4-26 – Sydney Water's projected improvement in risk profile for WRRFs



Source: Figure 20, State of the Assets Report FY2024

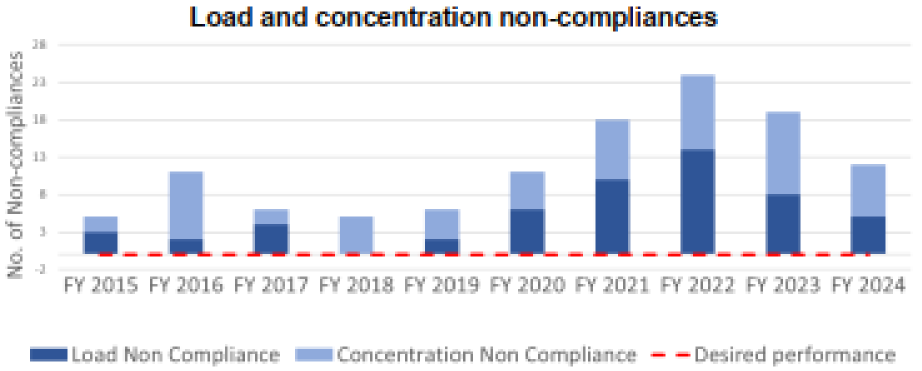
The WRRF Investment Plan states that the condition of assets is considered as "deteriorated" stating:

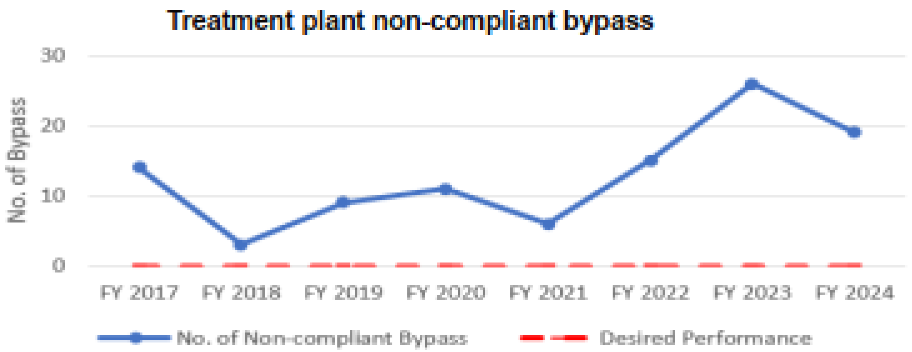
> *Condition of water resource recovery facilities is continued to be rated as red in 2023-24 as the asset performance has slightly declined and programs need to be fast tracked to manage the deterioration. The modelling and condition assessment have shown that an increasing number of assets are approaching the end of their useful lives*

We acknowledge that the plan states that overall asset performance of the WRRFs declined slightly in FY24. However, the explanation given for the WRRF asset condition red category is confusing given that Table 7 of the State of the Assets Report FY24 indicates performance is 'stable' and a single and slight year-on-year decline is not normally taken as indicative of deterioration, especially when performance is better or the same as four years ago.

Sydney Water has highlighted the impacts of recent wet years on the performance of its wastewater system. In its presentation of the WRRF renewals program the business highlighted performance against two metrics. These suggest that the recent wet years have increased non-compliances.

Figure 4-27 – WRRF compliance trends for two parameters





Source: Sydney Water presentation 3H

We note that the source of the 'desired performance' line on these graphs is unknown, does not appear to align with the business's own targets set out in Table 12 of the water resource recovery facility program investment plan of 12 and 13 events respectively.

It explained that *"frequent upgrades are needed due to growth and capacity limitations, aging infrastructure, and new effluent limits*".

In terms of relevant key system performance metrics we note[37]:

- Load and concentration limit non-compliances: were at 12 in FY24 which is in line with the business's own target. The State of the Assets Report highlights the importance of plant optimisation and upgrades as well as regulatory responses to extreme wet weather periods.
- Treatment Plant Non-Compliant Bypass: these were at 19 in FY24 and classed as having an 'improving' five year trend (albeit this is difficult to reconcile with the graph above, unless it is a weather-corrected trend). Of these events there were *'a small number of asset failure related non-compliant bypasses'*.
- Dry Weather overflow (code 'L1.3'): at 246 was well within the business's own target of 270 or below.

[37] Based on the text and tables in Section 3.2 of the Water Resource Recovery Facility Renewals Program Investment Plan

In summary we note:

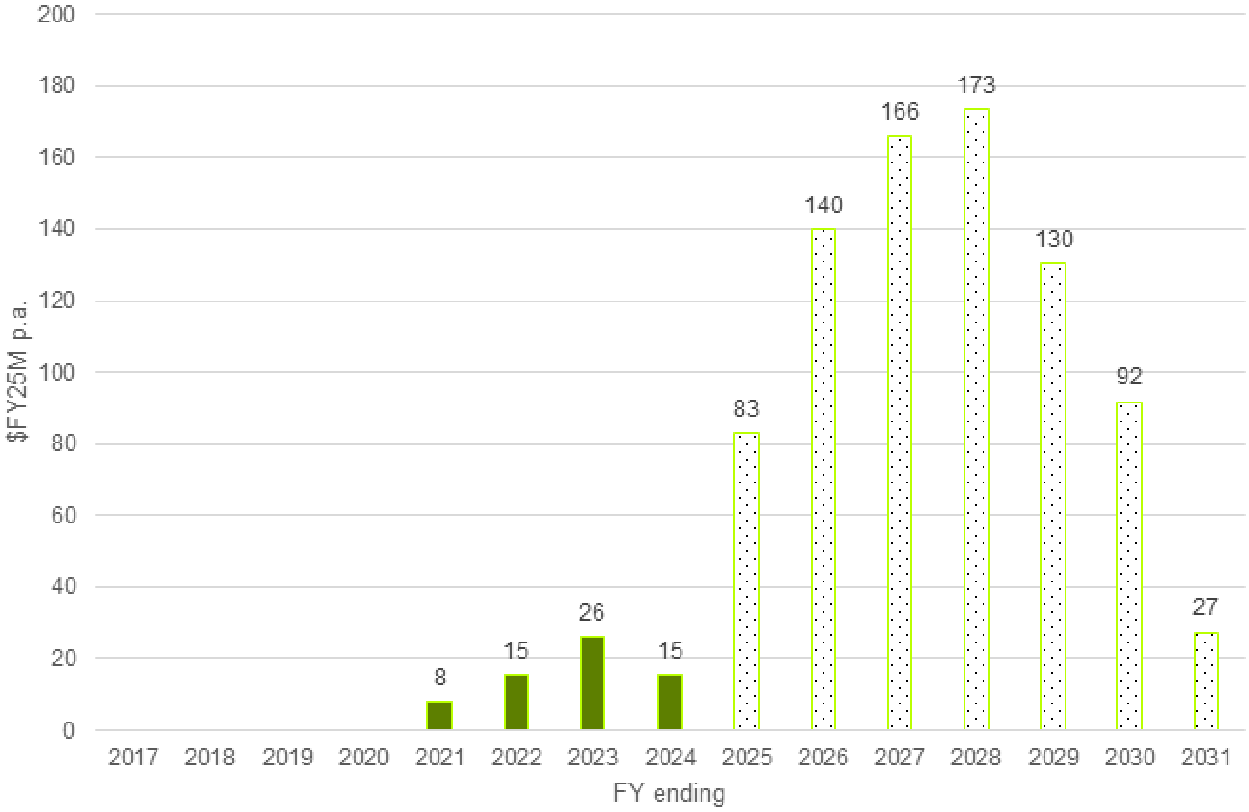
- The business is proposing a significant step up in WWRF renewals expenditure especially from FY27 on.
- At a WRRF portfolio level the justification for the proposed level of expenditure "post optimisation" has not been made. Some level of risk is inherent in a wastewater system (and any asset system) and, as discussed in Section 2, it is not clear why the business has chosen this particular level. The justification that the current level of risk is too high and for customers paying more to reduce this risk has not been made.
- There does appear to be an increase in the number of unplanned jobs being carried out compared to the pre 2019 period. However, we have limited confidence in the meaningfulness of the data given the effects of significant changes such as outsourcing and subsequent in-housing, the broadly stable situation since 2019 and the breakdown maintenance rate, asset performance index and repeated failure rates in FY23 and FY24 being the same as or better than FY20 and 21 for example.
- The business has stated that some of the issues it faces require upgrades due to growth and capacity limitations. It is not wholly clear how strongly linked its service performance challenges are to asset condition and performance (i.e. renewals) rather than capacity and growth.

We consider the specifics of the Bondi WRRF program below.

Bondi WRRF program

Expenditure of $701M is included in the pricing proposal (i.e. FY26 to FY30) for the wastewater treatment component of the Bondi renewals program. It makes up the majority (56%) of the proposed WRRF renewals program ($1,255M) and a large share (30%) of overall wastewater renewals ($2,365M).

Figure 4-28 – Proposed Bondi WRRF renewals expenditure



Source: Analysis of RFI96

NB: expenditure from FY25 onwards is purely based on the RFI96 expenditure figures and does not incorporate the effects of the reconciliation adjustment which has not been allocated to renewals types.

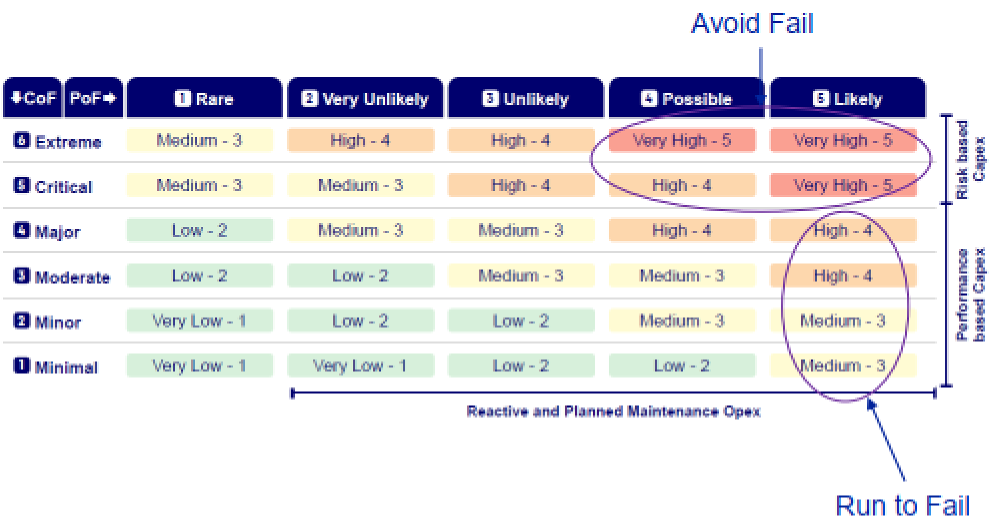
Whilst these are the totals included against this program line, in its presentation about the program, the business has also quoted an 'adjusted' expenditure taking account of its proposed portfolio adjustments, of $473M. It has also presented a more recent "project forecast" estimate (dated September 2024) of $514M.

Sydney Water has provided a download of its asset data (description, age, PoF, risk and Process CoF for example) for Bondi WRRF. The breakdown is summarised in Table 4-17. This suggests that 60% of all assets are assumed to have the highest possible consequence of failure (score 6 or 'extreme') and a further 27% have the second highest consequence of failure. This means that, unless they are classified as having a probability of failure of less than 1 in 10 years, most of the assets at Bondi WRRF may fall into the business's list of assets which should be replaced (i.e. backlog) due to having both probability of failure and risk scores of 4 or 5 (see matrix below).

Given that even some new or nearly new assets may have a PoF of 4 or higher[38] this does not appear to be a reasonable decision criterion for determining the scale of a renewals program. **If it is correct that so many assets have an extreme CoF and therefore high risk score then renewal (leaving CoF unchanged) may not be the best solution, but rather alternative actions to reduce the consequences of failure** (e.g. additional redundancy, operational measures, response preparedness, elimination of single points of failure, etc).

As a result of these classifications the vast majority of Bondi WRRF's assets (78%) have been given one of the two highest risk scores (4 and 5).

Figure 4-29 – Sydney Water's Risk Matrix scoring



↓CoF PoF→	1 Rare	2 Very Unlikely	3 Unlikely	4 Possible	5 Likely
6 Extreme	Medium - 3	High - 4	High - 4	Very High - 5	Very High - 5
5 Critical	Medium - 3	Medium - 3	High - 4	High - 4	Very High - 5
4 Major	Low - 2	Medium - 3	Medium - 3	High - 4	High - 4
3 Moderate	Low - 2	Low - 2	Medium - 3	Medium - 3	High - 4
2 Minor	Very Low - 1	Low - 2	Low - 2	Medium - 3	Medium - 3
1 Minimal	Very Low - 1	Very Low - 1	Low - 2	Low - 2	Medium - 3

Source: Sydney Water presentation 2E

We have not reviewed all of these assets and do not know them well. However, we note that from a brief glance at the asset data it is not immediately clear why assets such as 29 silencers[39] (out of 33) have the highest possible CoF (6 i.e. extreme), and all but four have the highest risk scores of 5 (very high) or 4 (high). It is not clear what extreme risk silencers would relate to.

[38] Noting that 18% of the assets assigned the highest risk and probability of failure scores (i.e. 4 or 5) at Bondi WRRF are ten years old or less.

[39] Typically devices used to reduce the noise generated by equipment such as pumps and blowers

It is also not clear why a deodorising pump for tanker outloading or four butterfly valves from the raw sludge storage tank to the outloading area or co-generation gensets[40] would have CoFs of 5 and the highest possible risk scores of 4 or 5. We do not know the assets well but **are generally surprised by how many high risk scores (seemingly driven partly by the high process CoF scores) there are.** Having such high numbers in the highest classifications suggests that **the classifications may not be useful in distinguishing the assets which most urgently need attention from others.**

Table 4-17 – Number of assets at Bondi WRRF by consequence of failure

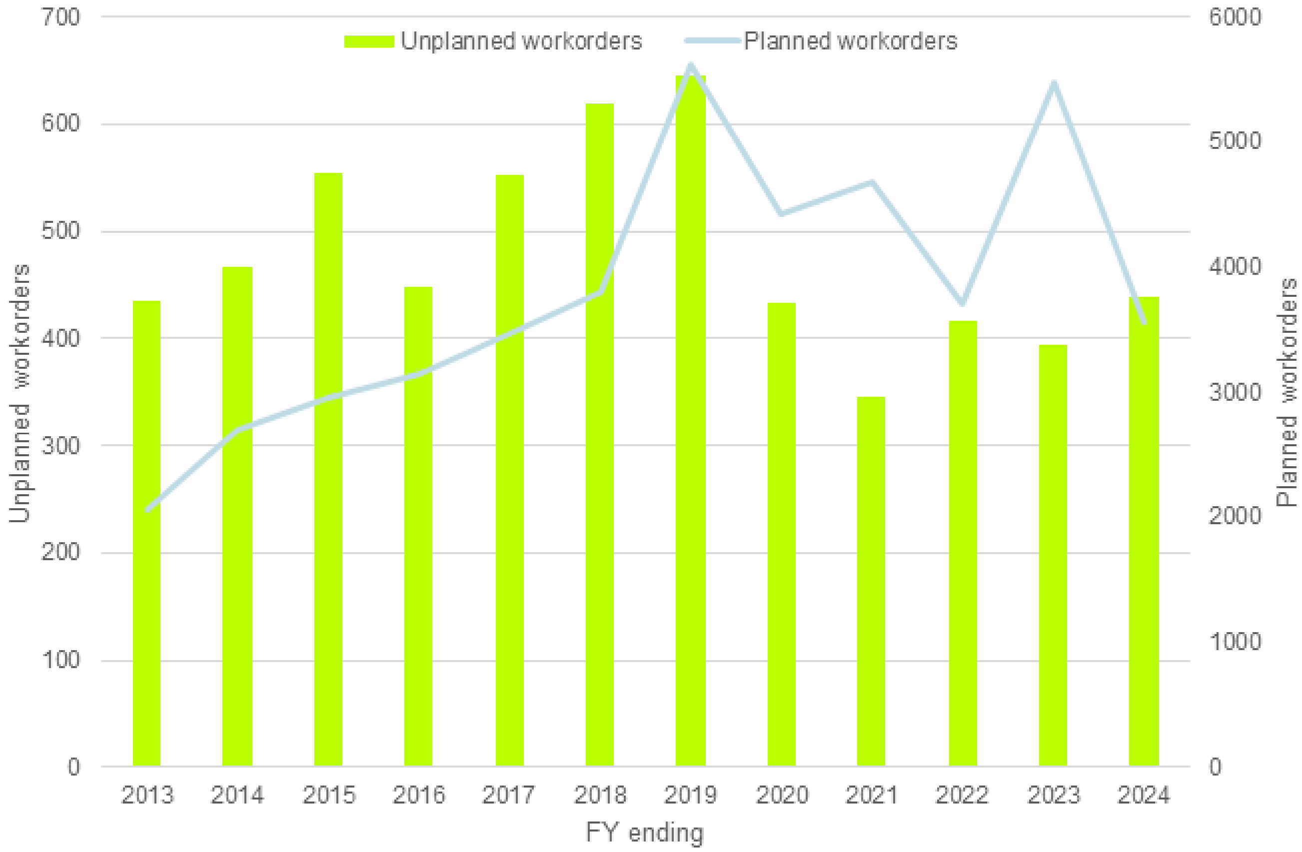
CoF score	Number of assets	Percentage of assets
6	5274	60%
5	2414	27%
4	1105	13%
3	1	0%
2	0	0%
1	1	0%
Total	**8795**	

Source: Analysis of RFI 103.1. Note the CoF information provided is labelled as "process" consequence of failure, which Sydney Water uses to identify and assess assets in their broader system context as stated in its document "250312 Attachment 1 - Draft Sydney Water Expenditure Review Fact and Confidentiality Check".

The business has also provided a download of all workorders since 2013. These are not immediately indicative of a facility seeing increasing unplanned workorders. Rather, there seems to have been a reduction since FY19 even whilst planned activities have not increased over the same period.

[40] Assets such as "Valve - Butterfly - No.1, From Raw Sludge Storage Tank to Outloading Area" and "Co-Generation Genset Package Group 1"

Figure 4-30 – Bondi WRRF workorder trends

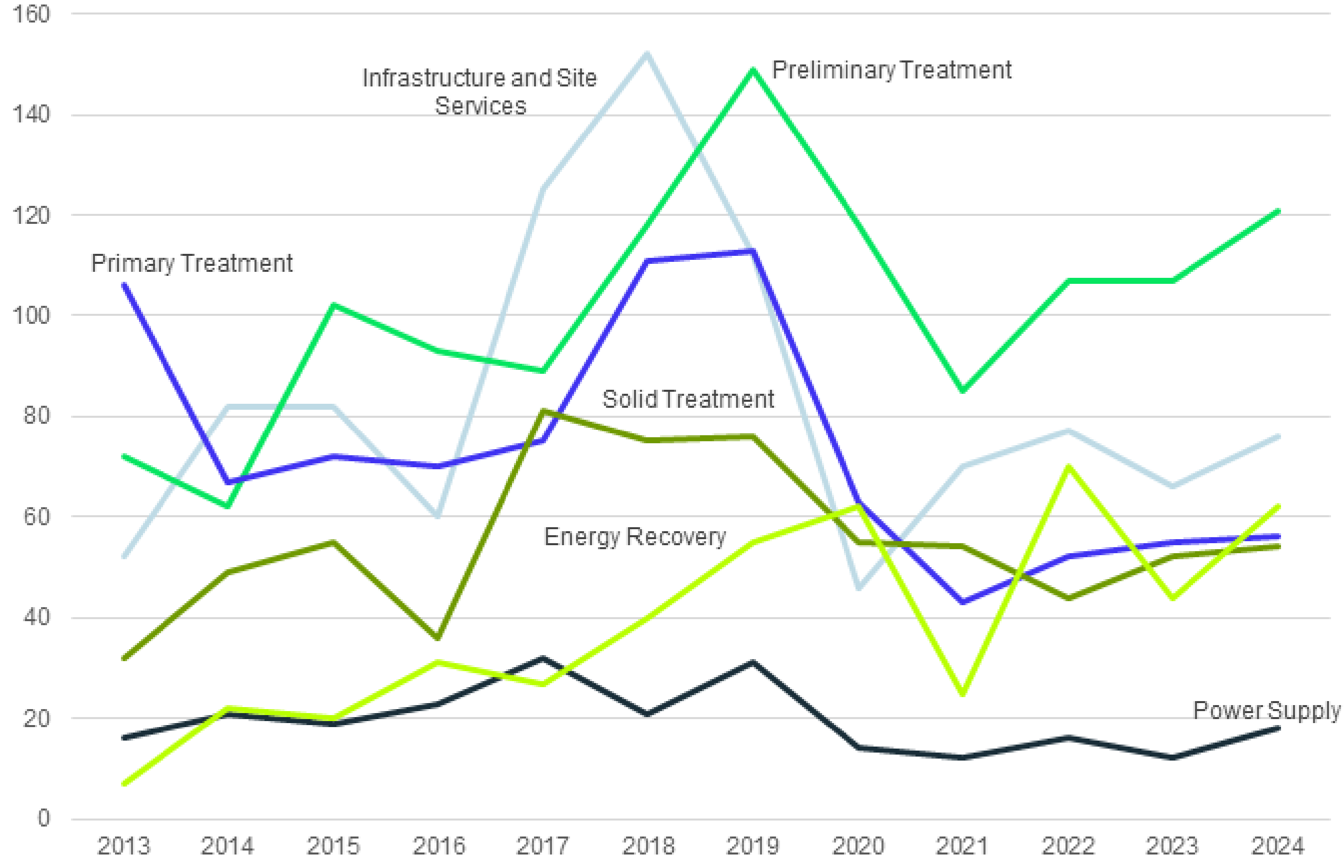


Source: Analysis of RFI 246

This suggests that unplanned workorders have not obviously been on an increasing trend and are lower than at any time before 2020. This is not supportive of a significant deterioration in asset condition and performance.

Looking at the process units having unplanned workorders suggests that preliminary treatment and 'infrastructure and site services' are the process units requiring most unplanned maintenance. It is difficult to discern a clear deterioration or improvement in any of these process units from this data.

Figure 4-31 – Bondi WRRF work order trends by process unit



Source: Analysis of RFI 246. NB: graph only shows process units with >20 unplanned work orders per annum.

Bondi WRRF has capacity to service flows until about 2046. However, the business considers that:

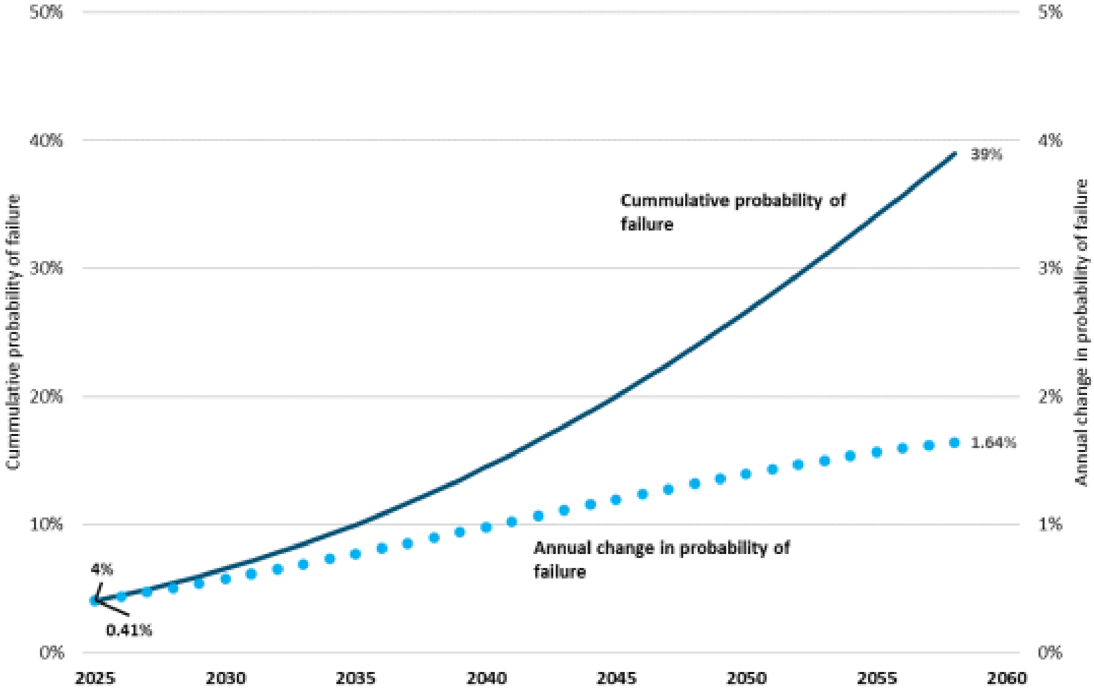
> *the facility and treatment process equipment is aged and unreliable. In particular, existing equipment is obsolete impacting on redundancy due to limited spare parts, having reached the end of its design life, and do not comply with current operational and other standards*[41]

Sydney Water sets out a number of issues related to equipment life (equipment having exceeded design life and geotechnical works not at current standards), structural deterioration and obsolescence.

It projects the probability of failure of the WRRF (appearing to be based on cliff-face discharge) increasing over time as follows.

[41] Bondi Wastewater System Reliability Investment Program: Program Business Case, May 2024

Figure 4-32 – Sydney Water's estimated probability of failure of Bondi WRRF

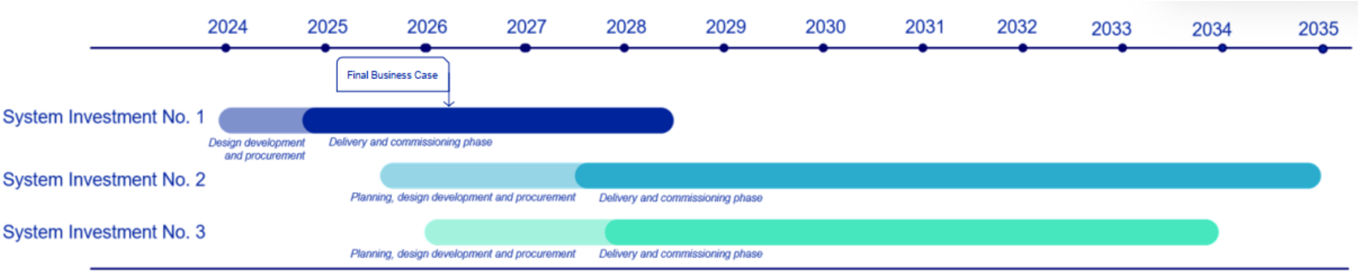


Source: Bondi Wastewater System Reliability Investment Program: Program Business Case, May 2024

The business has carried out an options appraisal for the whole Bondi system (network and treatment works), including a cost-benefit analysis and multi-criteria assessment of shortlisted options (upgrade existing, total system upgrade, partial system upgrade and new system) and concluded that upgrade of existing assets is the preferred option once uncertainty is taken into account.

The business has identified three "system investments" across both the network and WRRF as follows:

Figure 4-33 – Bondi WRRF proposed investments



System Investment No. 1	Program of work includes:
	• rehabilitation of BOOS Section 2
	• renewal and upgrade works at Bondi WRRF, including
	  o accommodation building refurbishment and upgrades
	  o refurbish and renewal of Ben Buckler vent stack and Eastern Safe Haven
	  o upgrade smoke management and gas detection systems, gas compressors, service pipework (compressed air, treated effluent, supernatant), industrial water pumps for RDTs
	  o install new emergency generators
	  o refurbish and upgrade isolation penstocks and stopboards
	  o refurbish and upgrade ocean outfall pumps (OOPS) and OOPS heat exchangers
	  o upgrade OOPS roof cavern
	  o upgrade of ventilation system (short-term works)
	  o upgrade of electrical equipment (short-term works)
	  o remediate and upgrade civil, mechanical, structural and geotechnical structures (short-term works)
	  o remediate and upgrade effluent channel and cliff-face bypass channel

System Investment No. 2	Program of work includes:
	• renewal and upgrade works at Bondi WRRF, including
	  o upgrade of inlet works screenings and grit handling and collection systems
	  o upgrade of ventilation system (fresh-air and foul-air) and install new odour control facility
	  o upgrade of solids collection and treatment systems (digester upgrade and mixing, sludge dewatering and out-loading systems)
	  o upgrade of low-voltage and high-voltage electrical equipment (balance of works)
	  o upgrade of SCADA control system
	  o remediate and upgrade civil, mechanical, structural and geotechnical structures (balance of works)
	  o upgrade of plant wide services and amenity around the site
	  o remove redundant materials and equipment (include pipework, steelwork, equipment, electrical works etc.)

System Investment No. 3	Program of work includes: • rehabilitation of the BOOS Section 1 and 3 • new wastewater pumping station and rising main to consolidate SP0001 and SP0002 • new rising main to enable transfer part wastewater flows from Bondi wastewater system to adjoining Malabar wastewater system

Source: Bondi Wastewater System Reliability Investment Program: Program Business Case, May 2024

It considers System Investment No 1 to be a ‘no regret’ package of work. At interview we were told that some of the work is already underway (e.g. the rock bolts).

Based on the range of costs presented, and the lack of detailed description of the scope of works envisaged for the amount (after portfolio adjustment) in the price proposal, it appears that the scope of the program is relatively fluid at this stage.

The proposed program is large but does not appear to be well defined yet. Whilst the asset performance data made available to us is not obviously supportive of a very significant program of renewals, we recognise that this is a key WRRF with many significant risks attached to it and likely does need a program of renewals.

However, the logic behind the pace, prioritisation, scale and choice of assets to be renewed has not been presented in a clear, justified and robust way. The options considered are very strategic at this stage and it is likely that the program will benefit from further consideration of the best ways to mitigate the system, rather than just asset, risks (i.e. consideration not just of renewals, but other capital or operational measures).

We also note that this is a key facility and significant works will be challenging to undertake in a complex high risk live operating environment. As such we consider it likely that works will take longer to undertake than currently assumed.

At present, we are not persuaded that this is a fully mature program whose scope and scale of expenditure is well understood and justified. We are persuaded that there are significant risks associated with failure at Bondi WRRF. However, as mentioned in Section 2.3.2, **we consider that the business would benefit from a more holistic approach than asset/renewals driven programs to identify (or demonstrate that renewals are) the optimal way to mitigate these significant risks. Our brief scan of some of the asset risk categorisations also**

suggests that there is room for improvement in this area especially as regards their use in deriving a renewals program.

We consider it likely much of the expenditure will take place later than proposed because of the complexity of the operating environment and the evolving scope. We also consider that the business has not made the case that the issues at Bondi are sufficiently unique to consider it as separate to our overall view of WRRF renewals presented above.

In summary we note:

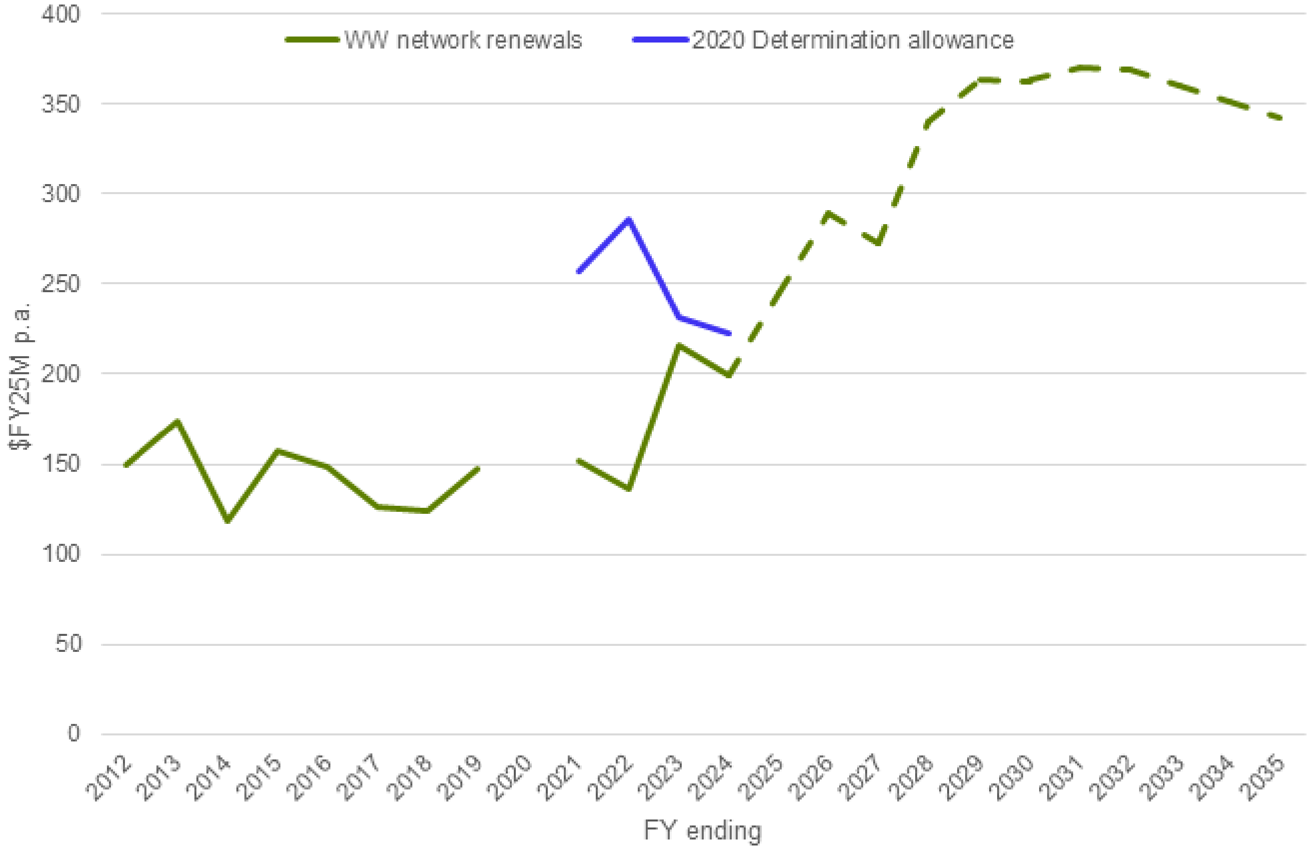
- **The business is proposing a very large renewals program at Bondi WWRF.**
- **We are persuaded that there are significant risks associated with failure at the facility. However, we are not persuaded that the business has demonstrated that its proposed renewals are the best ways to address these risks and that this is a fully mature program whose scope and scale of expenditure is well understood and justified.**
- **There is no obvious concerning trend in unplanned work orders and we have concerns about the robustness of the risk classifications applied.**
- **It is likely that significant works will be challenging to undertake in a complex high risk live operating environment leading to delays beyond those reflected in Sydney Water adjustments.**
- **We do not consider that the business has justified that the proposed renewals program is justified or the best approach to dealing with the risks at Bondi WRRF in the coming Determination period.**

4.6.2.2 Wastewater network

Unlike WRRF renewals, Sydney Water has spent significantly less than its allowance for wastewater network renewals as can be seen in Figure 4-34 below and in the negative variances for critical sewer, wet weather overflow, the NSOOS and BOOS and pumping station renewals.

The business is proposing an increase in expenditure compared to the 2020 Determination period, especially driven by increased expenditure on the NSOOS program but also increases in pumping station renewals and other critical sewers such as the SWSOOS and BOOS.

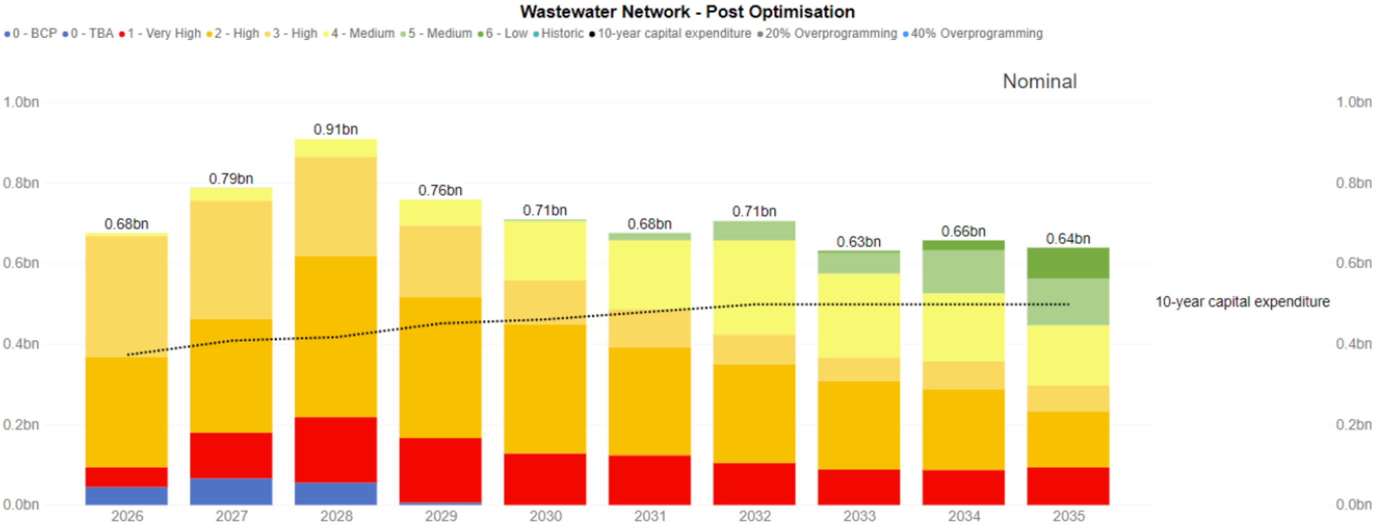
Figure 4-34 – Wastewater network renewals expenditure



Source: analysis of RFI96 and 2020 AIRSIR
NB: expenditure from FY25 onwards is purely based on the RFI96 expenditure figures and does not incorporate the effects of the reconciliation adjustment which has not been allocated to renewals types.
NB2: FY12 to 19 figures are based on all 'existing mandatory standards' spend on non-WWTP assets. We do not have this information for FY20

As with WRRFs the business has used the process outlined in Section 2.3.2 to assess the current and future risk of its assets and derive an unconstrained needs investment to which it has then applied adjustments. For the wastewater network the proposed expenditure appears to be sufficient to renew all 'very high' and most 'high 2' assets in the period to FY30.

Figure 4-35 – Wastewater network asset risk levels and renewals expenditure

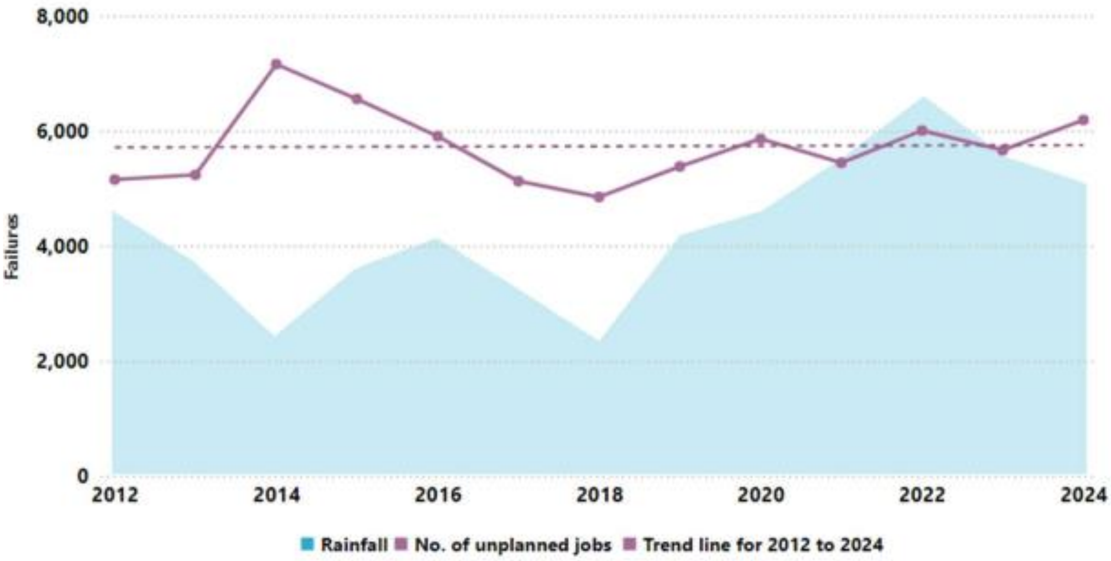


Source: Figure 3, Wastewater Network Renewals Program Investment Plan 2025.

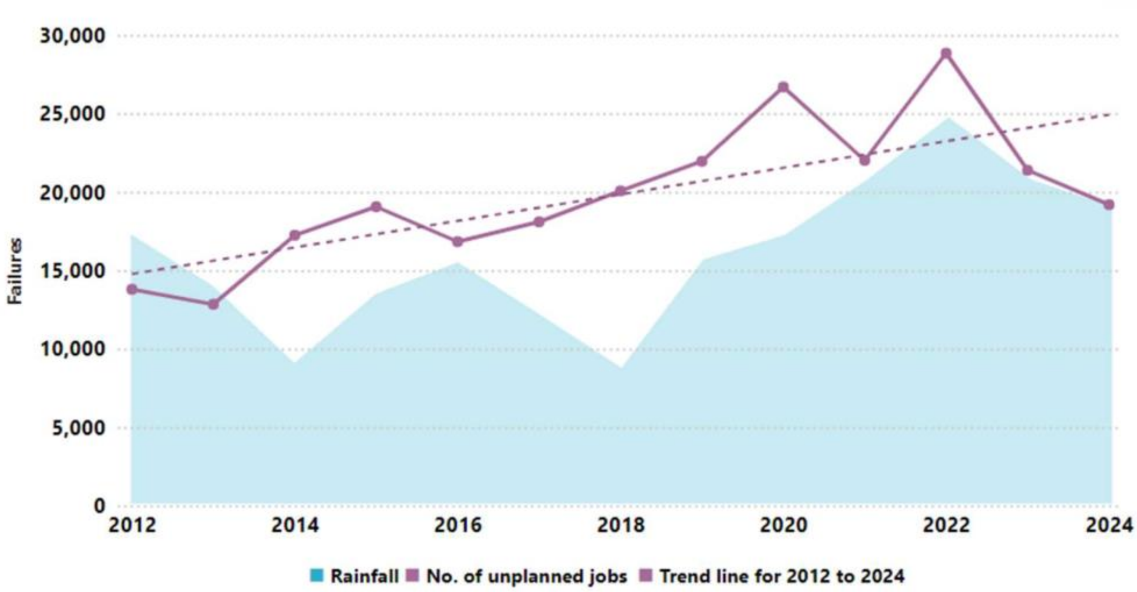
The business has provided a summary of unplanned jobs (assumed to be reactive work orders) by year for different network assets as reproduced below. This suggests broadly stable asset failures for pumping stations and critical gravity trunk mains and possibly an increase in failures for reticulation mains albeit with reductions in FY23 and 24. As above, we note that these are 'raw' numbers and may be affected by changes in policy or approach.

Figure 4-36 – Wastewater network unplanned jobs by year

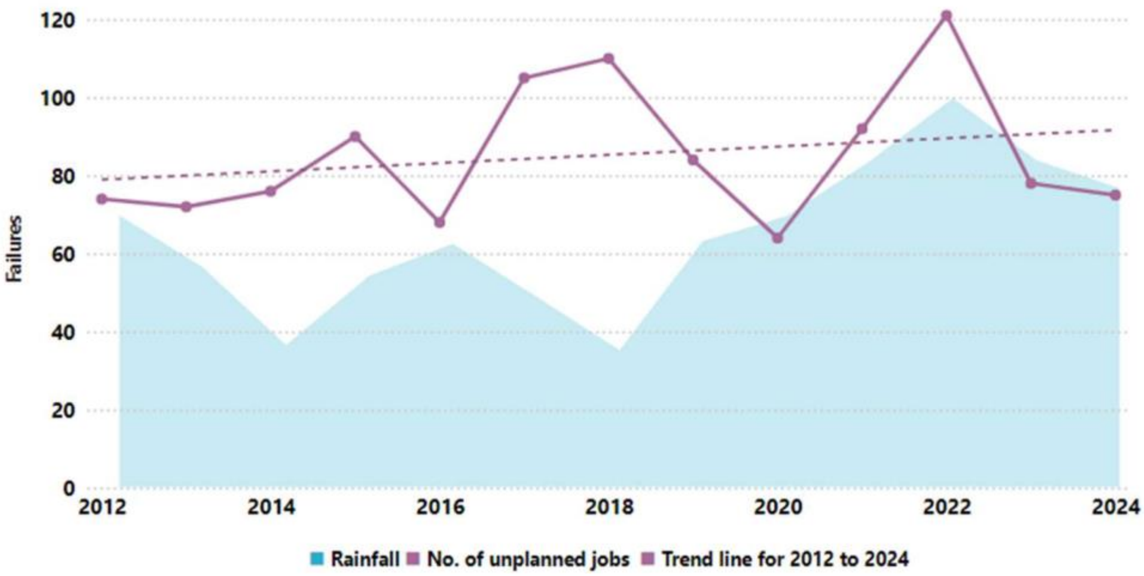
Pumping stations:



Gravity reticulation mains



Gravity trunk mains (critical)



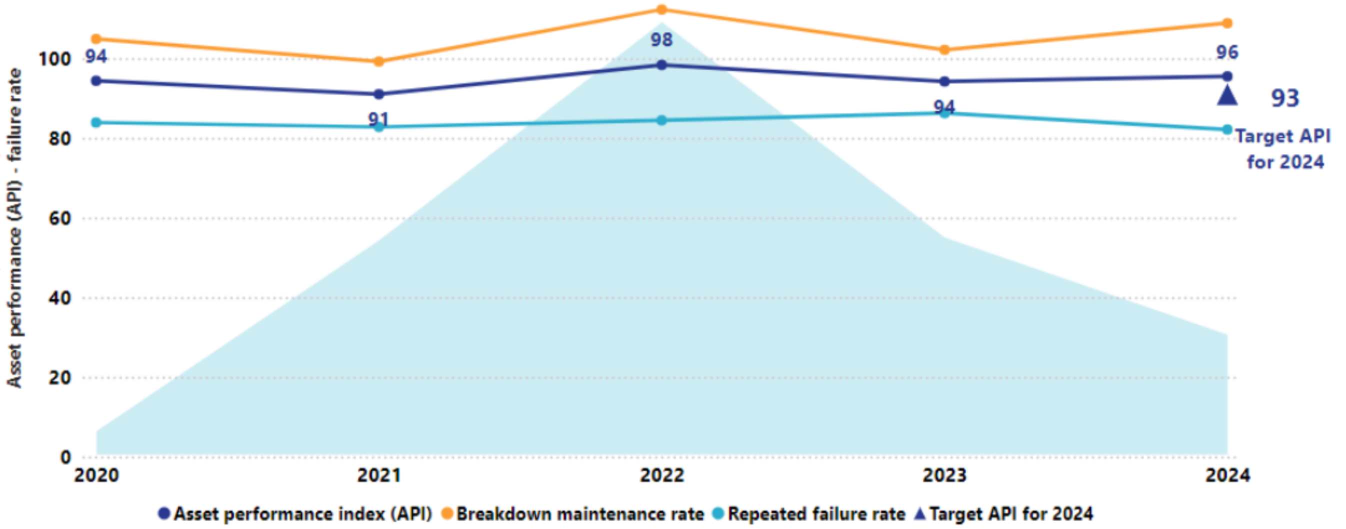
Source: Figures 6-8 in RFI 79, 84, 98, 99, 100, 103, 130, 135, 141, 142, 199

The 2024 State of the Assets report classifies wastewater network assets' performance as improving in FY22, FY23, and FY24 except for pressure mains (improving in FY22 and FY23, stable in FY24) and pumping stations which it classifies as stable on the five year trend[42]. This is supported by breakdown maintenance rate and repeat failure trends as shown below.

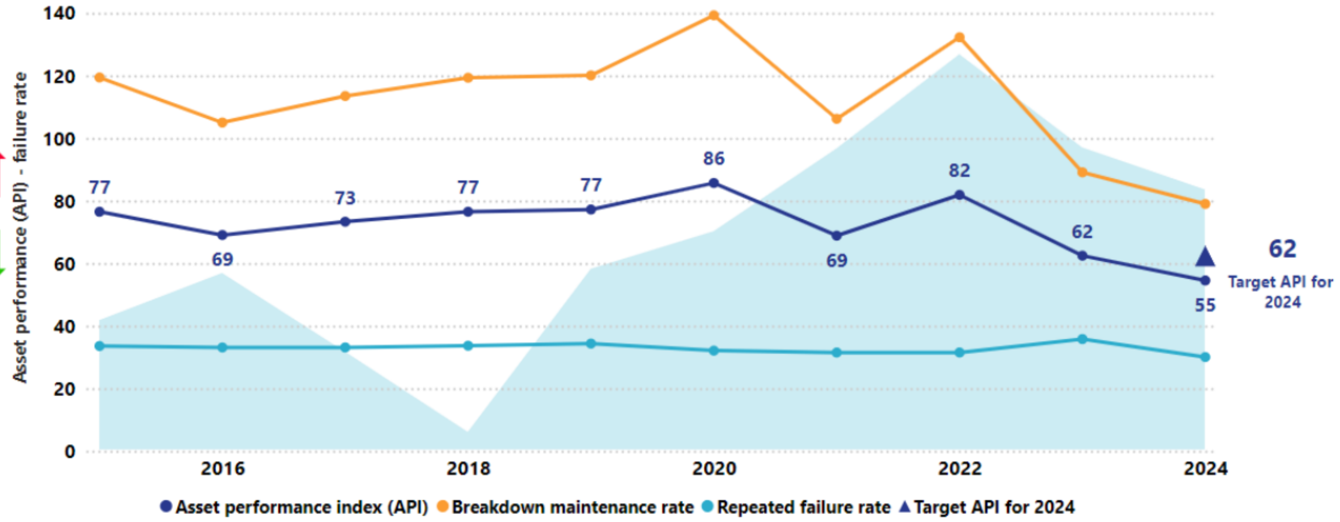
Figure 4-37 – Wastewater network asset performance

Network facilities (pumping stations, chemical dosing, OCU)

[42] Ref: Table 7 of State of the Assets Report FY24



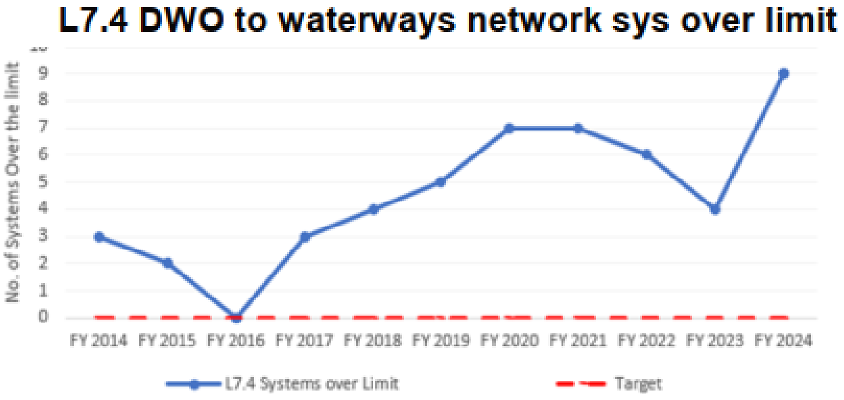
Mains (pressure, trunk and reticulation)

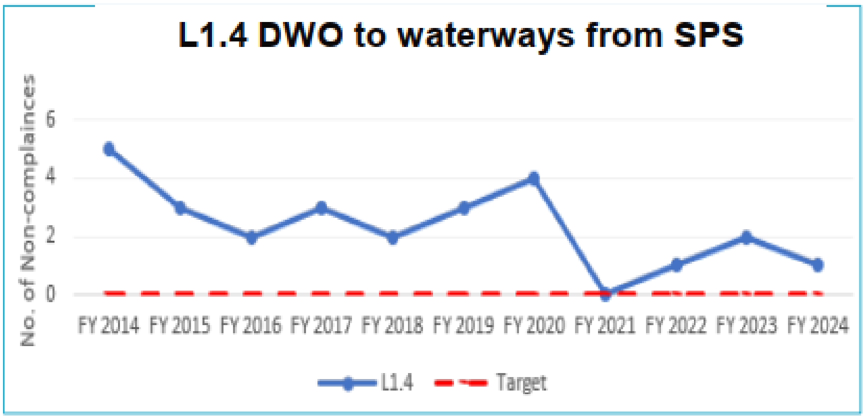


Source: State of the Assets Report FY24

Sydney Water has provided a time series of system performance including the two parameters set out below. We note that these point in opposite directions, with one on an apparent worsening trend and the other improving.

Figure 4-38 – Water network compliance trends for two parameters





Source: Sydney Water presentation 4E

The business makes the point that desilting and rehabilitation of critical trunk sewers is required[43]:

> *Heavy rains in the current period combined with market resource constraints have delayed desilting and remediation work on four of our critical trunk sewers (Southwestern Suburbs Ocean Outfall Sewer (SWSOOS), Northern Suburbs Ocean Outfall Sewer (NSOOS), Bondi Ocean Outfall Sewer (BOOS) and the North Georges River Submain (NGRS)) putting them at an unacceptably high risk of failure. To avoid significant public health and environmental risks because of a potential collapse, urgent de-silting and rehabilitation works are required.*

We review the case for the largest proposed critical sewer investment, NSOOS, below.

For wastewater pumping stations, the business makes the case that an increase in expenditure is required:

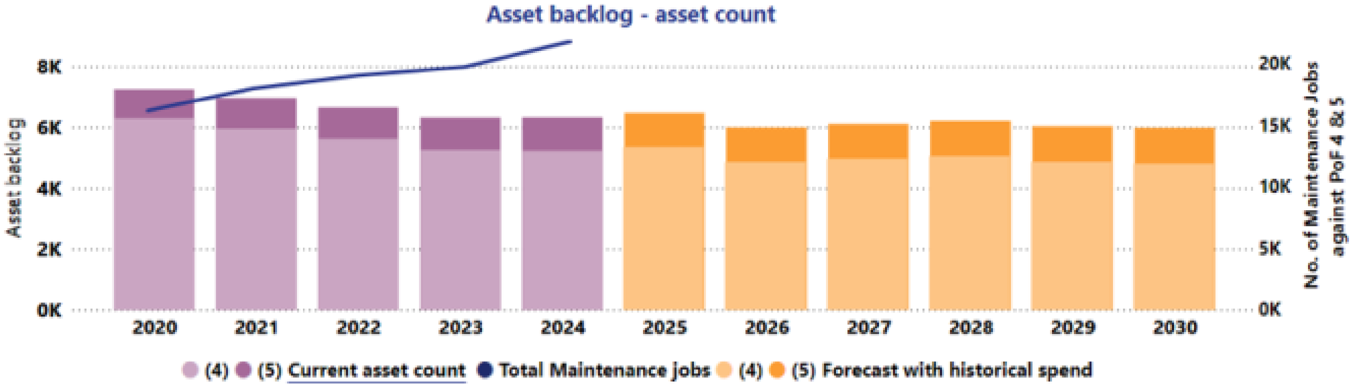
> *Due to the sustained price escalation across the industry, the increase in backlog of works and the need to update wastewater pumping station components to meet modern needs and standards, a higher investment than in the 2020-24 period is required in Period 1*

However, as can be seen in Figure 4-39 below the business's own projections for network facilities (of which pumping stations are an important part) suggests that the backlog has been reducing and will continue at this lower level under historical levels of expenditure. Figure 4-40 suggests instead that the business expects risk levels to reduce with its proposed budget. **We consider that the justification for the increase in wastewater pumping**

[43] Wastewater Network Renewals- Program Investment Plan

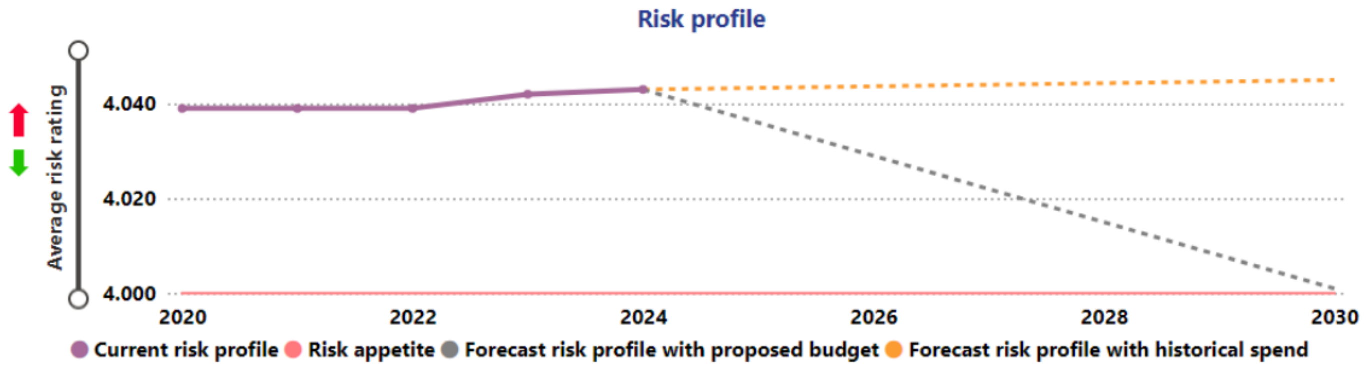
station renewals has not been clearly and robustly made. The business has not made the case that the current level of risk is too high or that customers should pay to reduce it.**

Figure 4-39 – Wastewater network facilities asset backlog projections



Source: Sydney Water Presentation 4E

Figure 4-40 – Sydney Water's projected improvement in wastewater network facilities risk profile



Source: Figure 21, State of the Assets Report FY2024

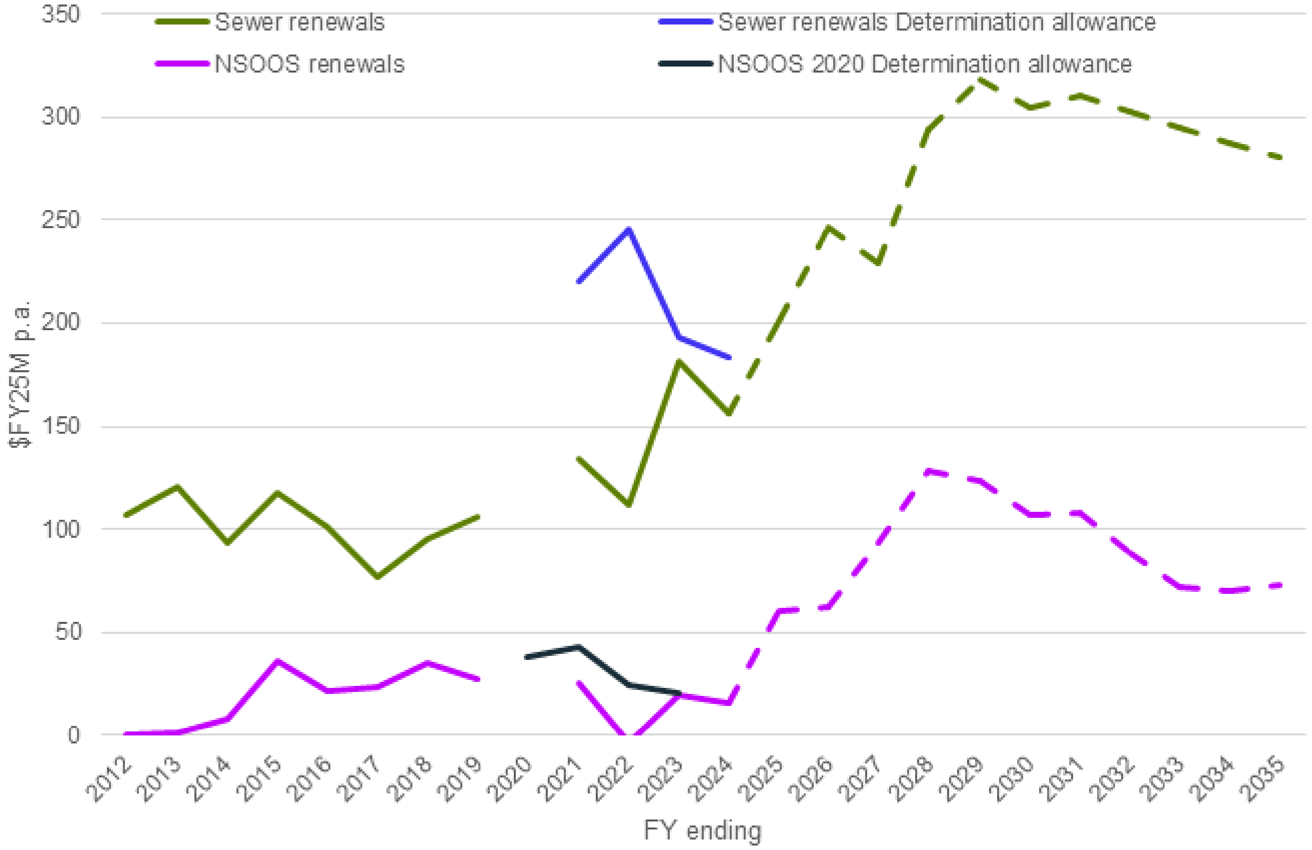
In summary we note:

- The business is proposing a step up in wastewater networks renewals expenditure especially from FY27 on.
- Asset performance is largely stable and the business's own projections for network facilities suggests that the backlog has been reducing and will continue at this lower level if historical levels of expenditure continue.
- The justification for the proposed level of expenditure has not been made. Some level of risk is inherent in a wastewater system (and any asset system) and it is not clear why the business has chosen this particular level. The justification that the current level of risk is too high and for customers paying more to reduce this risk has not been made.

NSOOS

Sydney Water is proposing to spend $514M on NSOOS and $1393M on sewer renewals[44] in FY26 to FY30 (both before portfolio adjustments). The proposed spend represents a significant increase in expenditure compared to historical levels of expenditure.

Figure 4-41 – NSOOS and sewer renewals



Source: analysis of RFI96 and 2020 AIRSIR.

NB: expenditure from FY25 onwards is purely based on the RFI96 expenditure figures and does not incorporate the effects of the reconciliation adjustment which has not been allocated to renewals types.

We reviewed historical and proposed expenditure on NSOOS in the 2020 review. We concluded that the expenditure had been prudent and efficient, recognising the condition and criticality of the asset, the complexity of works and Sydney Water's procurement approach.

The business explains the lower spend in the 2020 Determination period in terms of wet weather saying[45]:

> *The significant wet weather events of Period 0 have resulted in delays to program. The NSOOS is unique in Sydney due to its depth below ground. While the other major trunk mains are often less than 15 metres below ground, the NSOOS reaches depths of 100 metres at points and is one of, if not the deepest, ocean outfall sewers in the world. As such, workers are required to descend significant heights to reach the sewer to conduct work. Accessing the sewer during wet weather is highly dangerous. Flows in the sewer also*

[44] i.e. wastewater network excluding wastewater pumping station renewals.
[45] Wastewater Network Renewals- Program Investment Plan

become larger and faster during wet weather, putting even specialist-trained workers at risk if they are caught in the flows as there is no way to perform a rescue operation at that depth. As a result, work must be paused on the NSOOS in wet weather conditions

NSOOS is a critical asset and parts of it are in poor condition. As such we continue to consider that renewals work on the NSOOS is prudent and is likely to continue over many years. The two key questions are therefore (1) what lengths of the sewer need to be renewed/rehabilitated and (2) at what speed (length or spend per annum).

We do not have a clear view on (1) based on the information provided to us but given the length of the sewer, its condition and complexity of the work we consider it unlikely that all prudent work will be completed in the FY26 to 30 period. On (2), the rate of spend, we **note how challenging it is to deliver the works in such a deep sewer and consider that an average rate of spend similar to that achieved in the highest historical years is a sensible assumption, especially given that any wet weather or other incident** would be likely to reduce the ability to deliver. We discuss the wider view below.

4.6.2.3 Our view

Sydney Water has proposed a significant increase in expenditure mainly associated with the WRRF renewals program, critical sewers such as the NSOOS and the wastewater network more generally.

WRRF renewals

We consider that the business has not justified that current levels of asset risk are too high and that customers should pay to increase expenditure and reduce risk. Figure 4-26 suggests that maintaining expenditure at historical levels would lead to stable risk levels. It is also likely to be challenging to deliver significant upgrades on live plants.

Our approach to defining the upper and lower range for WRRF renewals is set out below.

Table 4-18 – Expenditure range for WRRF renewals

	Sydney Water proposal	Not strongly justified this period	Upper range	Lower range
Approach	Initial identification of unconstrained backlog removal adjusted to reflect affordability and deliverability	Asking customers to pay to reduce risk.	Approximate levels achieved in high spend years (e.g. FY19 and 23)	Average expenditure in FY21 to 24
Expenditure (based on SIR Capex 2a) (pre-efficiency challenge)	$1,250M from FY26 to FY30 or $250M p.a.	n/a	$205M p.a.	$176M p.a.
Risks	Live WRRFs are complex environments in which to deliver major renewals programs. This often leads to delays and higher costs.		WRRFs are significant risk assets Not all risks are visible from asset risk assessments and performance data. Reactive workorders have been on the increase in the long term.	As per upper range but with no reduction in risk delivered in period
Advantages	Reductions in risk associated with asset failure at WRRFs		Greater than average historical spend should reduce risk of significant events at key WRRFs The business has demonstrated it can deliver at this scale before.	Aligns with the business's projection that risk will remain stable at historical renewals levels of spend

Source: Analysis of RFI96

Wastewater network (excluding critical sewers)

The business has proposed an increase in expenditure including increased expenditure on pumping station renewals.

We consider that the justification for the increase in wastewater pumping station renewals has not been clearly and robustly made. The business's own projections for network facilities (of which pumping stations are an important part) suggests that the backlog has been reducing and will continue to do so under historical levels of expenditure.

The SIR Capex 2 has a separate line for wastewater pumping stations but not other network facilities. For this reason the adjustment below has been applied to wastewater pumping stations only.

Our approach to defining the upper and lower range is set out below.

Table 4-19 – Expenditure range for wastewater pumping stations

	Sydney Water proposal	Not strongly justified this period	Upper range	Lower range
Approach	Initial identification of unconstrained backlog removal adjusted to reflect affordability and deliverability	Asking customers to pay to reduce risk.	Average spend in FY21 to 24	Average expenditure in FY21 to 22 (lower spend years) given that the business expects that average historical spend would reduce backlog for facilities for e.g.
Expenditure (based on SIR Capex 2a) (pre-efficiency challenge)	$140M from FY26 to FY30 or $28M p.a.	n/a	$30M p.a.	$21M p.a.
Risks	n/a		DWOs have been increasing. Not all risks are visible from asset risk assessments and performance data.	As per upper range but with no reduction in risk delivered in period This is only an estimate. It is hard to know what the appropriate level of renewals is to maintain stable risk
Advantages	Significant reductions in risk associated with asset failure Relatively straightforward to deliver.		Average historical spend should reduce risk The business has demonstrated it can deliver at this scale before.	A reduction aligns with the business's projection that risk for network facilities will improve at historical renewals $s

Source: Analysis of RFI96

Critical sewers

The business has proposed an increase in expenditure on critical sewers driven by increased expenditure on the NSOOS program and other critical sewers such as the SWSOOS and BOOS. We note how challenging it is to deliver the works in critical sewers and set out below a potential upper and lower range.

Table 4-20 – Expenditure range for critical sewers

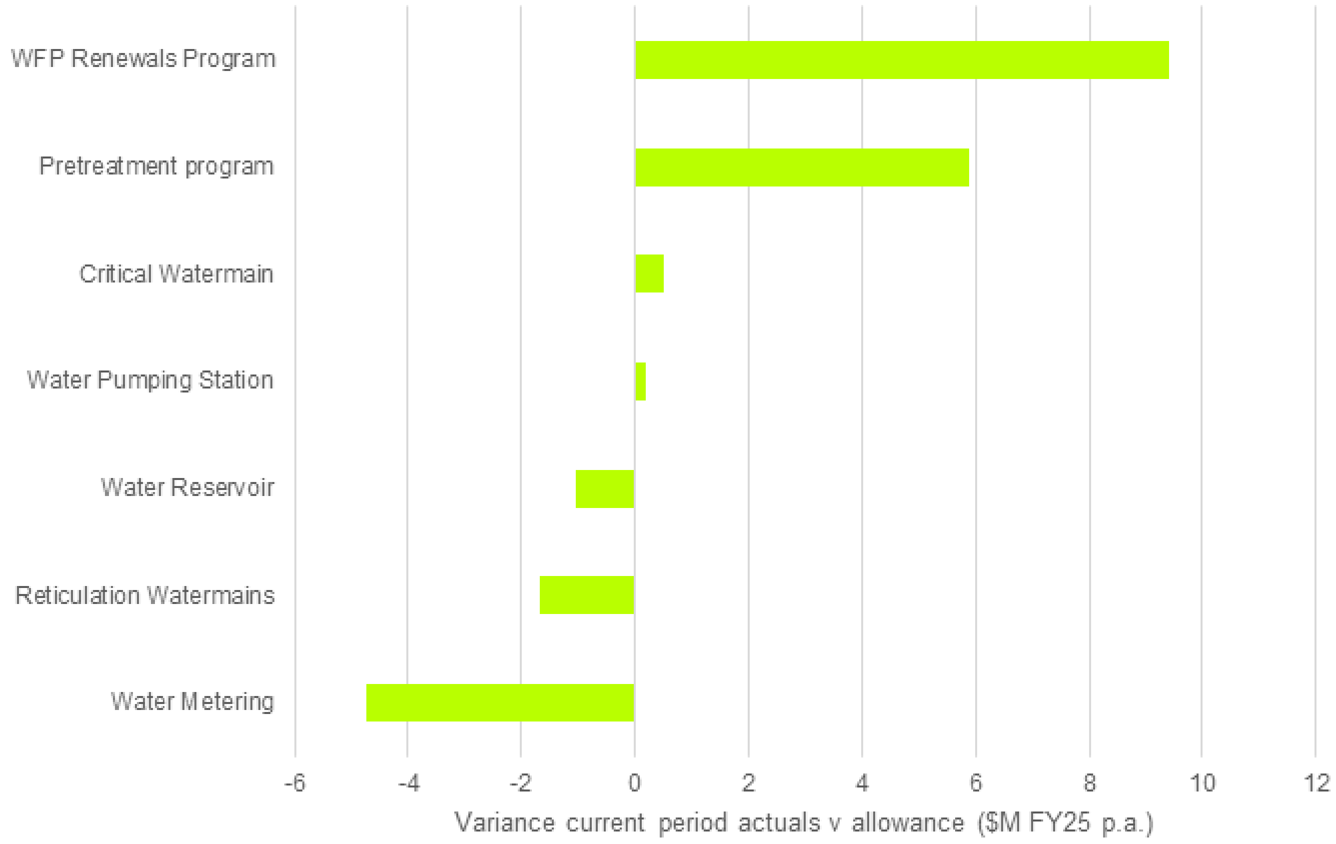
	Sydney Water proposal	Not strongly justified this period	Upper range	Lower range
Approach	Planners assumptions for lengths of sewer to be renewed in different packages.	Rate of delivery is optimistic	Approximate maximum yearly spend in FY20 to 24 period	Average expenditure in FY21 to 24
Expenditure (based on SIR Capex 2a) (pre-efficiency challenge)	$1,115M from FY26 to FY30 or $223M p.a.	n/a	$100M p.a.	$80M p.a.
Risks	Live critical sewers are challenging environments in which to deliver renewals and requires specialist resources. This often leads to delays as seen in recent years.		Parts of the critical sewers are in poor condition with failure risk.	As per upper range but with fewer risks mitigated
Advantages	These are by definition critical assets and parts are in poor condition. Works proposed are considered prudent.		The business has demonstrated it can deliver at this scale before.	No significant advantages beyond customer bills

Source: Analysis of RFI96

4.6.3 Water

Sydney Water spent 5% or $34M more than the 2020 Determination allowance mainly as a result of higher expenditure on water filtration plant (WFP) renewals and the pre-treatment program outweighing lower spend on water metering.

Figure 4-42 - Variance between water renewals allowance and expenditure in the 2020 Determination period

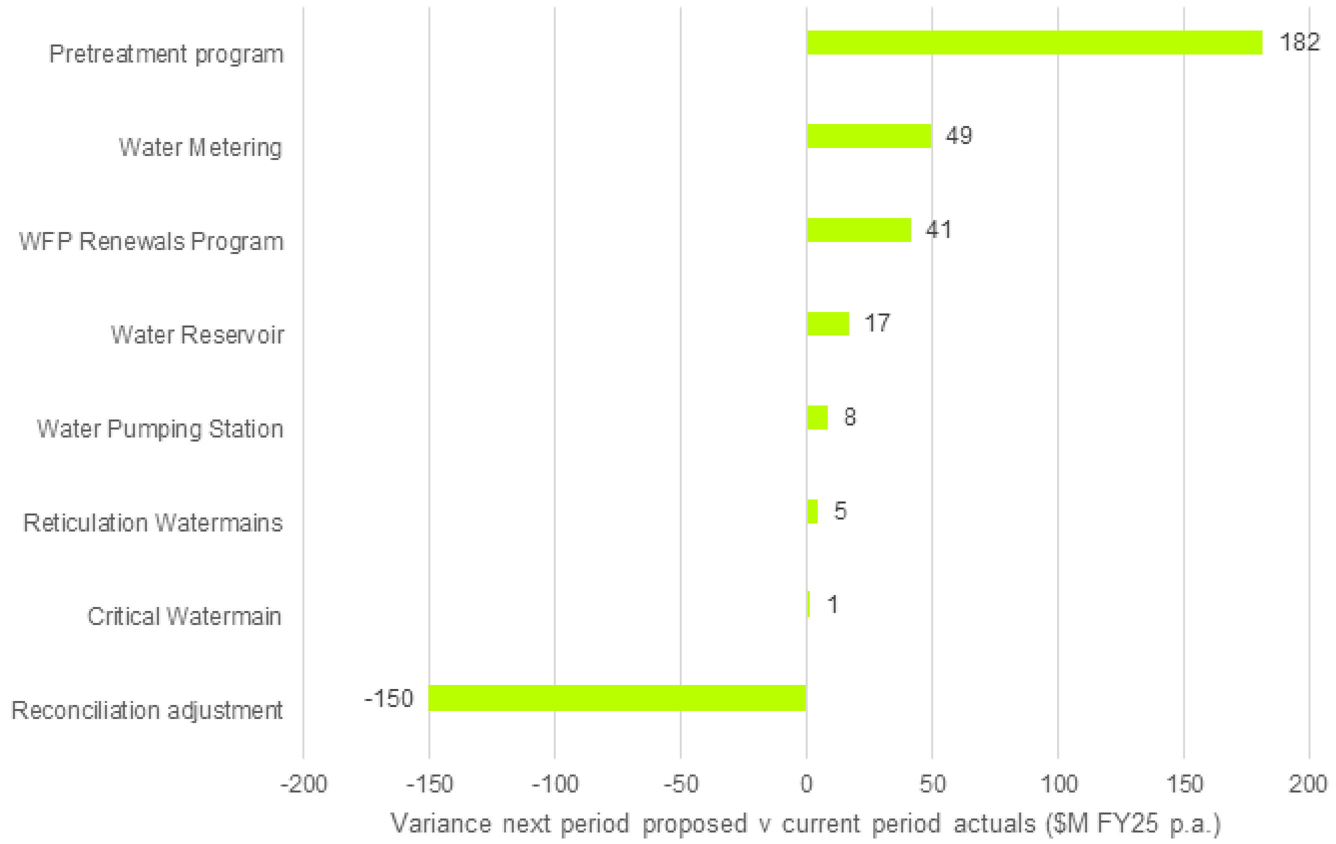


Source: Analysis of RFI96

The business has proposed a significant increase in expenditure for the FY26 to 30 period, $155Mp.a. or 84% higher than water renewals spend in FY20 to 24 (after adjustments). The increase is mainly driven by a very significant increase in the pretreatment program with water metering, WFP renewals and to a lesser extent water reservoirs also adding significantly to it as can be seen below. These four programs are examined in Sections 4.6.3.1, 4.6.3.2 and 4.6.3.3.

The proposed Prospect Pretreatment project is categorised as a 'compliance' project in SIR Capex 2. We have reviewed the project in this renewals section (under Section 4.6.3.2) for consistency given that the rest of the pretreatment program has been classified as renewals and also noting that that is how it has been treated in RFI 96.

Figure 4-43 - Difference between proposed and 2020 Determination period water renewals spend by program/initiative

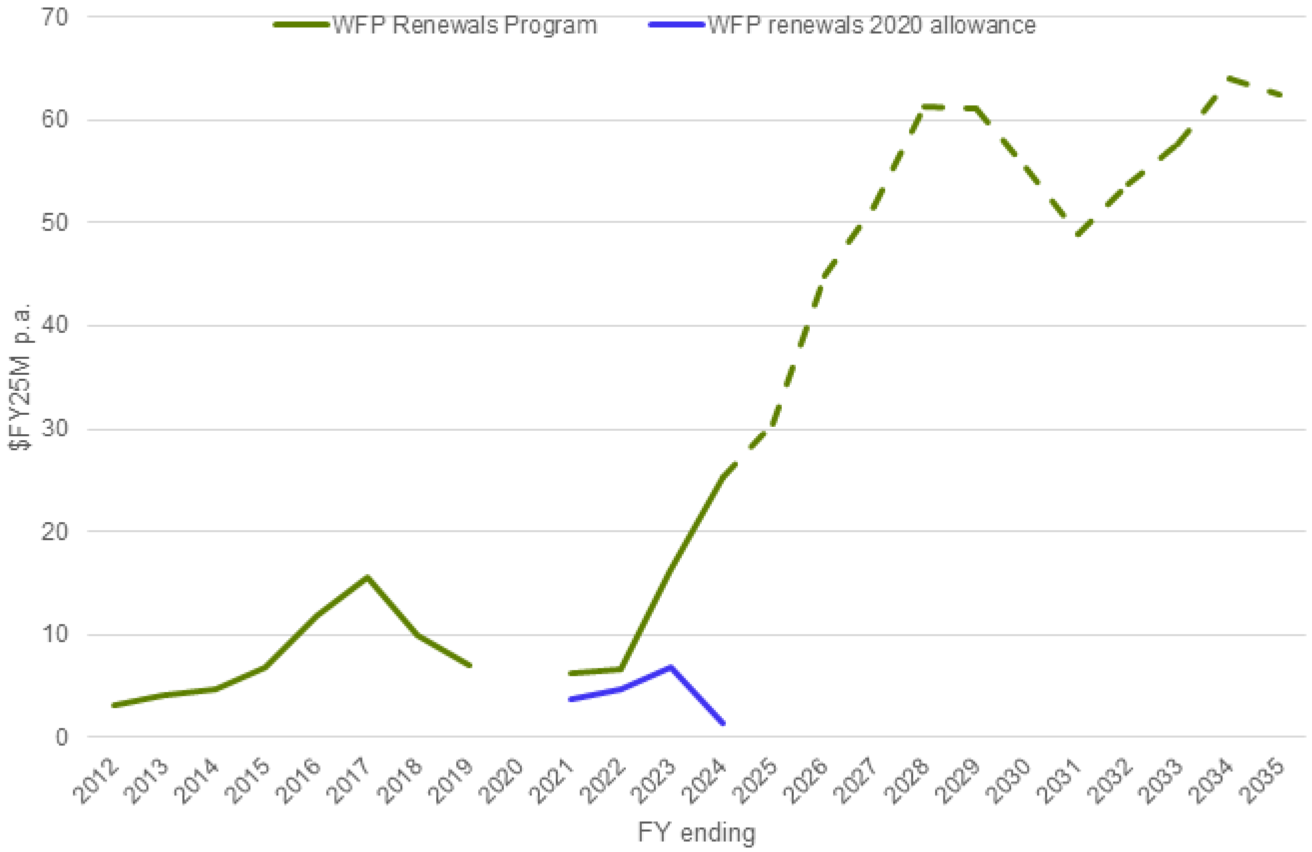


Source: Analysis of RFI96 and AIRSIR
NB: 'reconciliation adjustment' is the difference between the expenditure by program/initiative in RFI96 and the total water renewals expenditure in the SIR. It is assumed to represent the net effects of the adjustments applied by the business between the derivation of the costs in RFI96 and the SIR submission. The proposed expenditure by program/initiative does not incorporate the effects of these adjustments.
NB2: because this graph is based on RFI 96, Prospect Pretreatment is included in this category as a Renewal program. Noting that, in the SIR it is classified as 'compliance'.

4.6.3.1 WFP general renewals

Sydney Water has spent more than the assumptions in the 2020 Determination allowance and is proposing to significantly increase expenditure further.

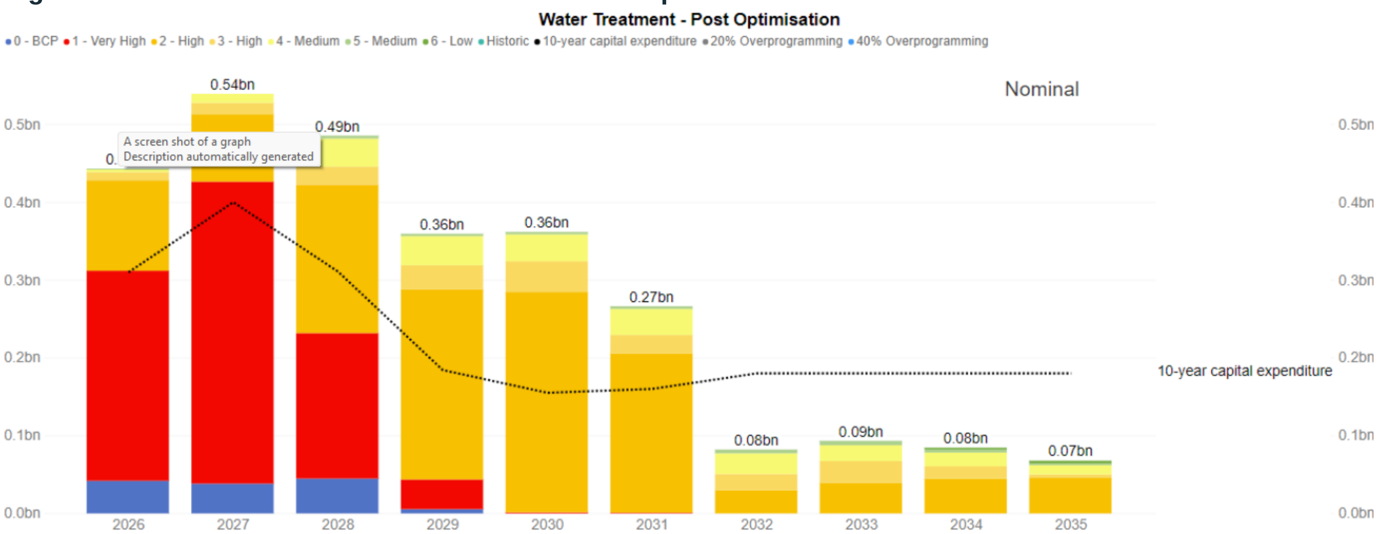
Figure 4-44 – WFP renewals expenditure



Source: analysis of RFI96 and 2020 AIRSIR.
NB: expenditure from FY25 onwards is purely based on the RFI96 expenditure figures and does not incorporate the effects of the reconciliation adjustment which has not been allocated to renewals types.

The business has used the process outlined in Section 2.3.2 to assess the current and future risk of its assets and derive an unconstrained needs investment to which it has then applied project/program and portfolio adjustments. For WFPs the proposed expenditure appears to be sufficient to renew all 'very high' assets and a reasonable number of 'high 2' assets in the period to FY30.

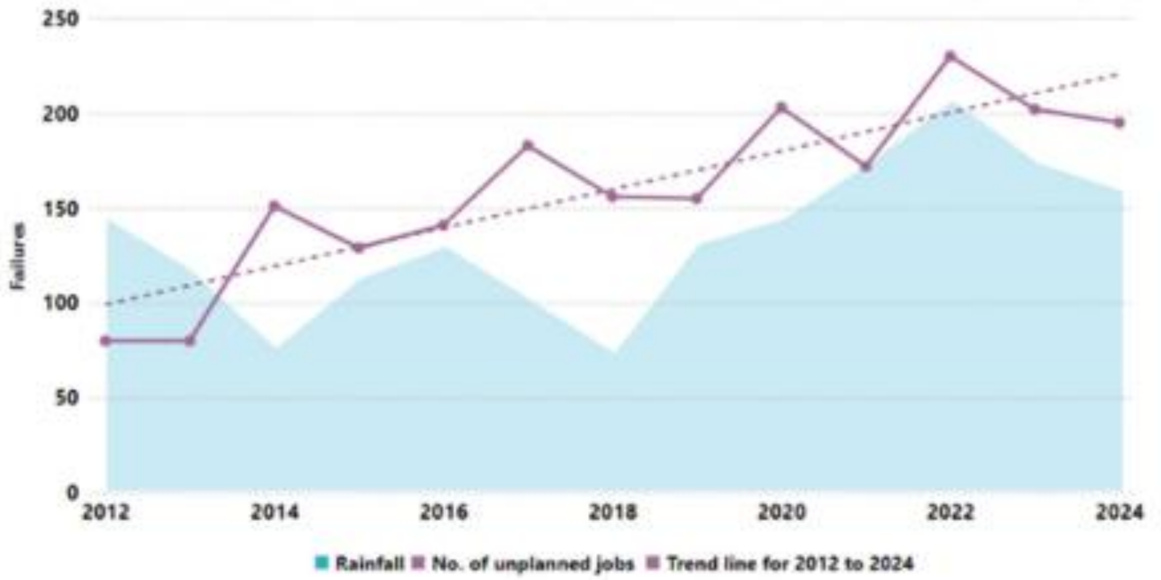
Figure 4-45 – WFP asset risk levels and renewals expenditure



Source: Figure 3, Water Filtration Plan Renewals Program Investment Plan 2025.

The business has provided a summary of unplanned jobs (assumed to be reactive workorders) by year for WFPs reproduced below. This suggests generally increasing unplanned jobs over time. This is perhaps not surprising over these timescales given that many of the WFPs were built in the second half of the 1990s so had relatively new assets in the 2010s. We also note that these are 'raw' numbers and may be affected by changes in policy or approach as well as any system changes or upgrades.

Figure 4-46 – WFPs unplanned jobs by year

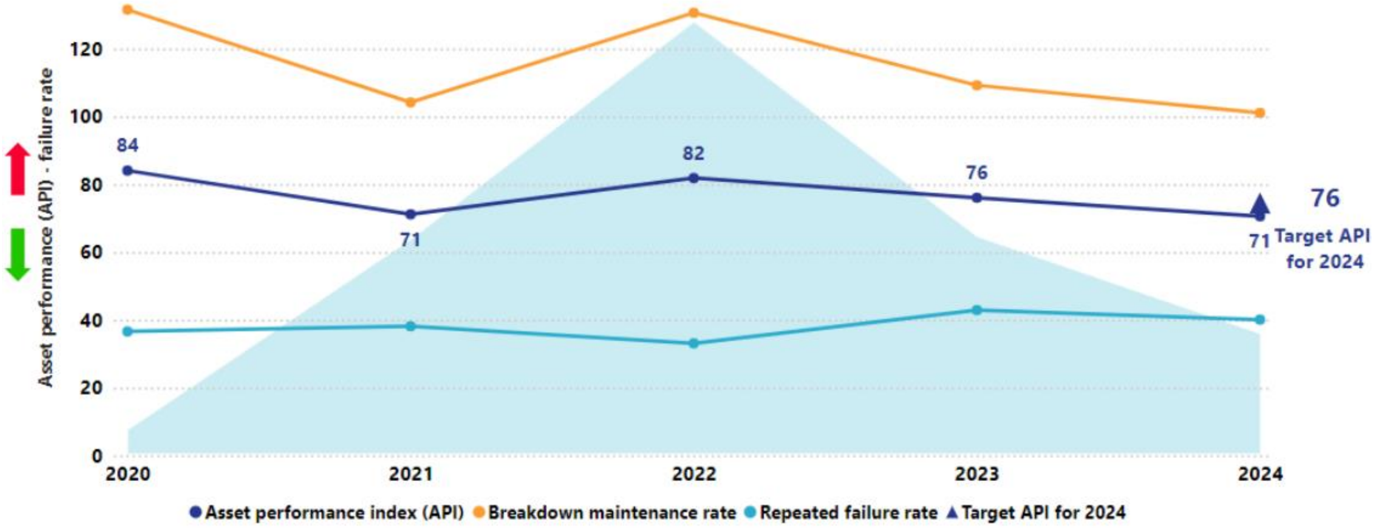


Source: RFIs 79, 99 & 100

The 2024 State of the Assets report classifies WFP assets' performance as improving in FY24 with an improving five year trend, having previously declined in FY22 and remained stable in FY23[46]. This is supported by breakdown maintenance and asset performance index data as shown below, although we note that this is just for Sydney Water operated plants.

[46] Ref: Table 7 of State of the Assets Report FY24

Figure 4-47 – WFP asset performance



Source: Figure 3, State of the Assets Report FY24

In terms of system performance the information provided suggests good compliance with the compliance requirements despite the adverse raw water quality conditions as can been seen below.

Figure 4-48 – WFP system performance

Performance Measure	FY22	FY23	FY24	5 Year Trend
Water				
Adherence to Australian Drinking Water Guidelines (ADWG)	■	■	■	≈
Water Continuity Standard - Properties affected by unplanned interruptions (>5hrs) in a financial year	■	■	■	↓
Water Pressure Standard - Properties affected by more than 12 pressure failures in a financial year	■	■	■	≈

Source: State of the Assets Report FY2024

The business's case for increased general WFP renewals appears to largely relate to the age of assets, stating[47]:

> *A large part of our asset base is reaching end of life and requires investment to renew or remediate failed, end of life, or high risk assets…. Our condition-based asset management practices have enabled many assets to operate far beyond their original design life, optimising costs to customers and efficiency of operations. Where assets pass their expected end of life while still performing within risk tolerances, we keep them in service to optimise costs for customers. Many assets are now reaching a point where they can no longer be efficiently kept in service or present a risk to customer services or our regulatory requirements due to their condition or performance. This has increased the forecast volume of renewals proposed for Period 1*

It presents the following backlog projections and profile of assets reaching end of life.

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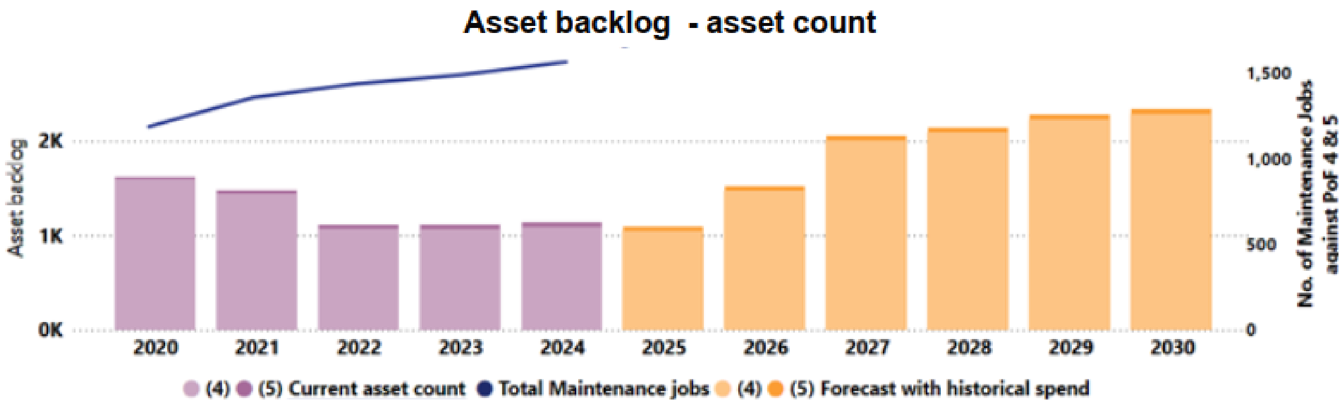
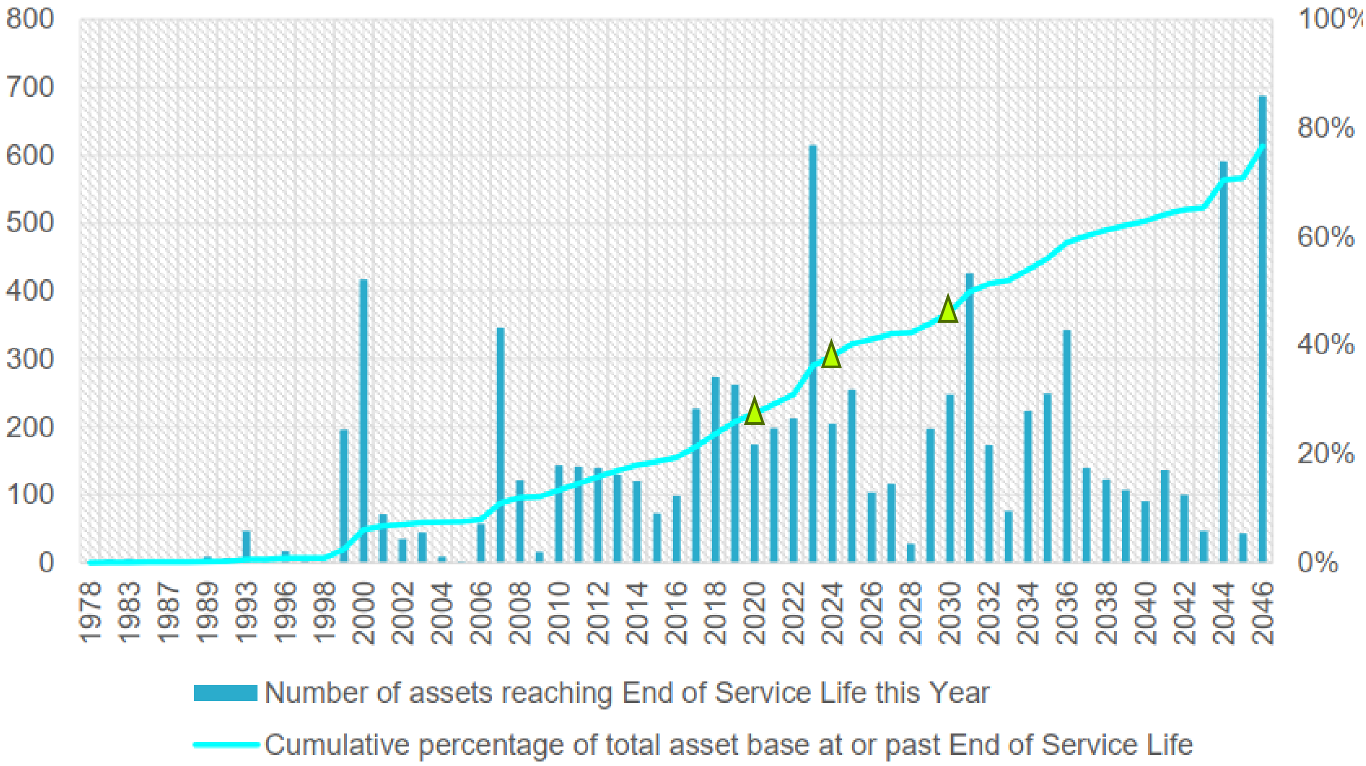
[47] Water Filtration Plant Renewals - Program Investment Plan

Figure 4-49 –WFP asset backlog projections



Source: Sydney Water Presentation 4N

Figure 4-50 – Sydney Water's projected profile of assets reaching end of life

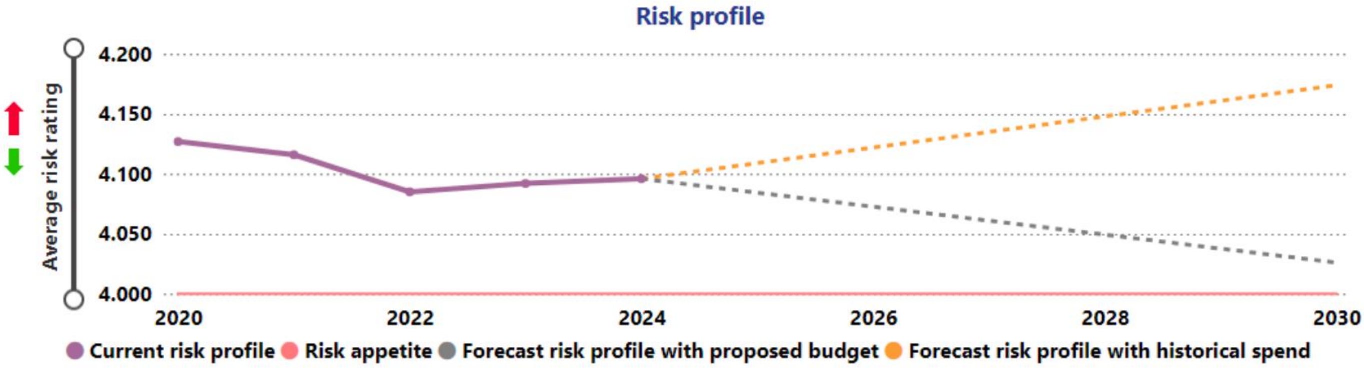


Source: Figure 14, Water Filtration Plan Renewals Program Investment Plan 2025.

NB: we have added the green triangles to indicate the start and end of the 2020 Determination period and the end of the next price period.

The business has also provided a projection of improving risk with the proposed budget:

Figure 4-51 – Sydney Water's projected improvement in risk profile



Source: Figure 17, State of the Assets Report FY2024

Whilst we agree and can see that more assets are likely to need replacement or refurbishment than in the early 2000s, we are not wholly convinced that the full amount of expenditure proposed is required:

- The asset backlog has been reducing and asset and system performance appear to be stable or improving in recent years. As can be seen in the figure above, the business is proposing to reduce risk (i.e. an improvement as opposed to stable risk). As set out in Section 2.3.2 if a business proposes to ask its customers to pay more to improve its asset performance/risk levels, we expect this to have strong customer support and justification in the form of a cost-benefit analysis or similar. This has not been provided to us. Instead the business has chosen a level of expenditure based on an unclear decision-making process.
- Asset lives are not generally a reliable basis for projecting renewals needs given that they are generally hypothetical with limited empirical or asset-specific tailoring. That said, the gradient of the cumulative 'assets at or past end of service life' in the FY26 to 30 period actually appears to be less steep than in the 2020 Determination period. If the asset lives are accurate this suggests that fewer assets will be coming to the end of their lives and (theoretically at least) need to be renewed in the coming period.

4.6.3.2 Pretreatment program

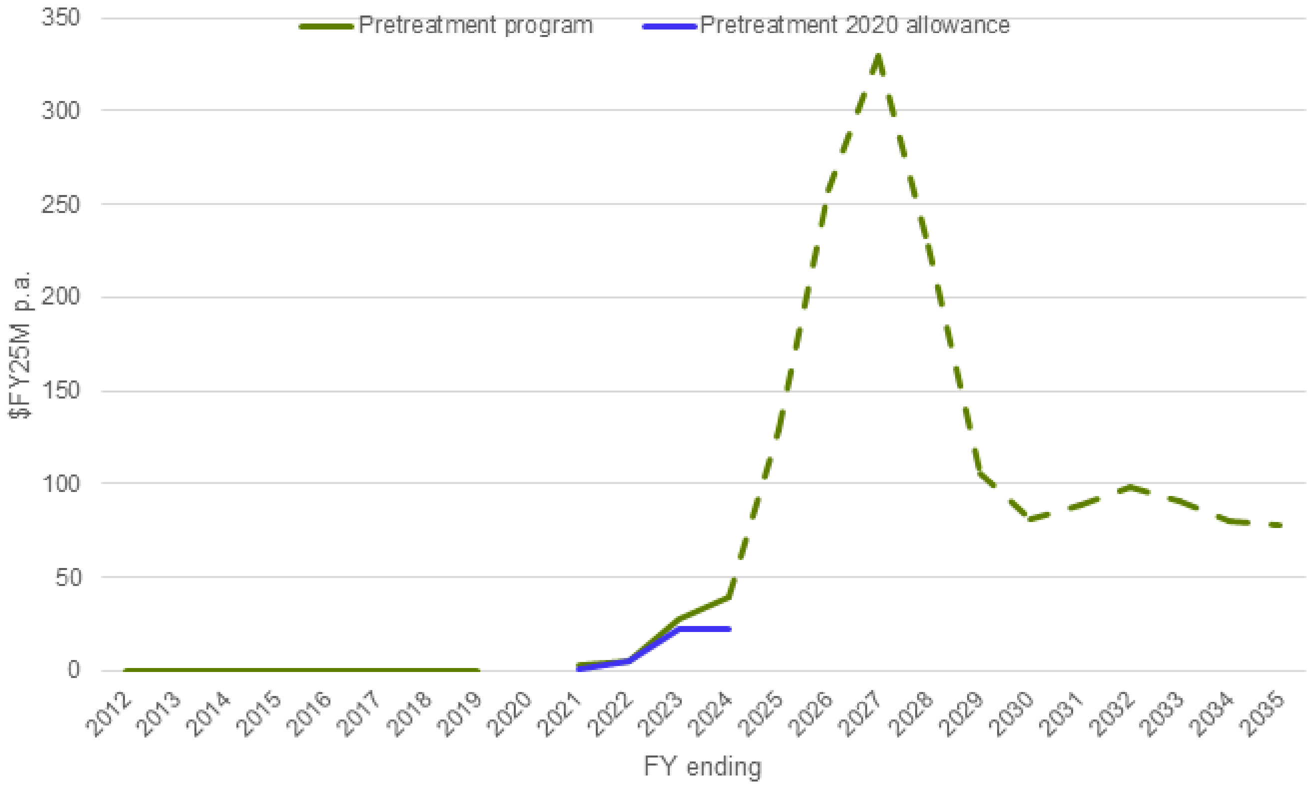
Most of Sydney Water's WFPs are conventional works without significant pre-treatment. Raw water quality was adversely affected following the bushfires in 2020 and subsequent heavy rains in 2021 and early 2022. As a result, since 2022 there have been a number of periods where WFPs have operated at reduced capacity as summarised by the business.

> *since 2022 there have been several periods at our WFP where we have been forced to operate under reduced capacity conditions for extended periods. We have met customer demands during challenging circumstances between 2020 to 2025 by drawing down on limited network storage and by using 'spare' capacity in our processes intended for planned growth. This means that as growth occurs, the risk of not being able to produce enough quality drinking water increases.*[48]

Sydney Water proposes a large program of works to bring in an additional stage of treatment to remove more of the contaminants from the raw water, with more than $1Bn capex proposed between FY25 and 31.

[48] Source: Water Filtration Plan Renewals Program Investment Plan 2025

Figure 4-52 – Pretreatment program expenditure



Source: analysis of RFI96 and 2020 AIRSIR.

NB: expenditure from FY25 onwards is purely based on the RFI96 expenditure figures and does not incorporate the effects of the reconciliation adjustment which has not been allocated to renewals types.

The works are understood to be proposed for eight WFPs[49]:

- Construction phase: Nepean WFP;
- Procurement phase: Prospect WFP;
- Planning & design phase: Cascade, Orchard Hills, Warragamba WFPs;
- Planning phase: Illawarra, Woronora and Macarthur WFP. Although Macarthur's investment is understood to be under 'growth'.

The costs are broken down for some of these works in Table 4-21 below. Prospect WFP is the most expensive of the works listed although we note that 'other' which presumably covers Warragamba, Illawarra and Woronora WFPs is a more significant cost line.

Table 4-21 – Pretreatment program by site ($FY25M p.a.)

	2025	2026	2027	2028	2029	2030	2031	FY25 to 31 Total
Prospect WFP Pretreatment	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

[49] Source: Water Filtration Plant Renewals Program Investment Plan 2025

	2025	2026	2027	2028	2029	2030	2031	FY25 to 31 Total
Orchard Hills WFP Pretreatment	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Nepean WFP upgrades and Pretreatment	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Cascade WFP Pretreatment	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Other – Pretreatment	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Pre Treatment Adjustment	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total (with adjustment)	**130**	**258**	**329**	**227**	**106**	**82**	**89**	**1,220**

Source: Analysis of RFI 96

The Nepean WFP Upgrade was initially proposed to be completed in the 2020 Determination period. The program will add pre-treatment and increased filtration capacity, including an additional 20Mld sidestream treatment process to allow production of 33 Ml/d from the site, as well as carrying out renewals of a significant portion of the existing WFP. The pretreatment capability costs are projected to be [redacted] or 30% of the remaining [redacted] costs from FY26 on.

Sydney Water explains that there have been delays due to turbidity after the 2020 rainfall event being different to the initial design, [redacted][50]. This means that the project is expected to have taken at least eight years to deliver (noting that we don't have expenditure data for FY20).

Table 4-22 – Nepean WFP Upgrade Spend Profile ($FY25M p.a.)

2021	2022	2023	2024	2025	2026	2027	2028	Total
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Source: RFI 96

We have reviewed the case for the Prospect pretreatment project as set out below.

Prospect pretreatment

Prospect WFP is the main source of drinking water for the Prospect Water System, supplying more than 80% of Greater Sydney's water needs. The proposed project includes the proposed design and build of a new Pre-Treatment Plant, undertaking flood mitigation works and upgrades to the Prospect WFP.

[50] Source: Water Filtration Plan Renewals Program Investment Plan 2025

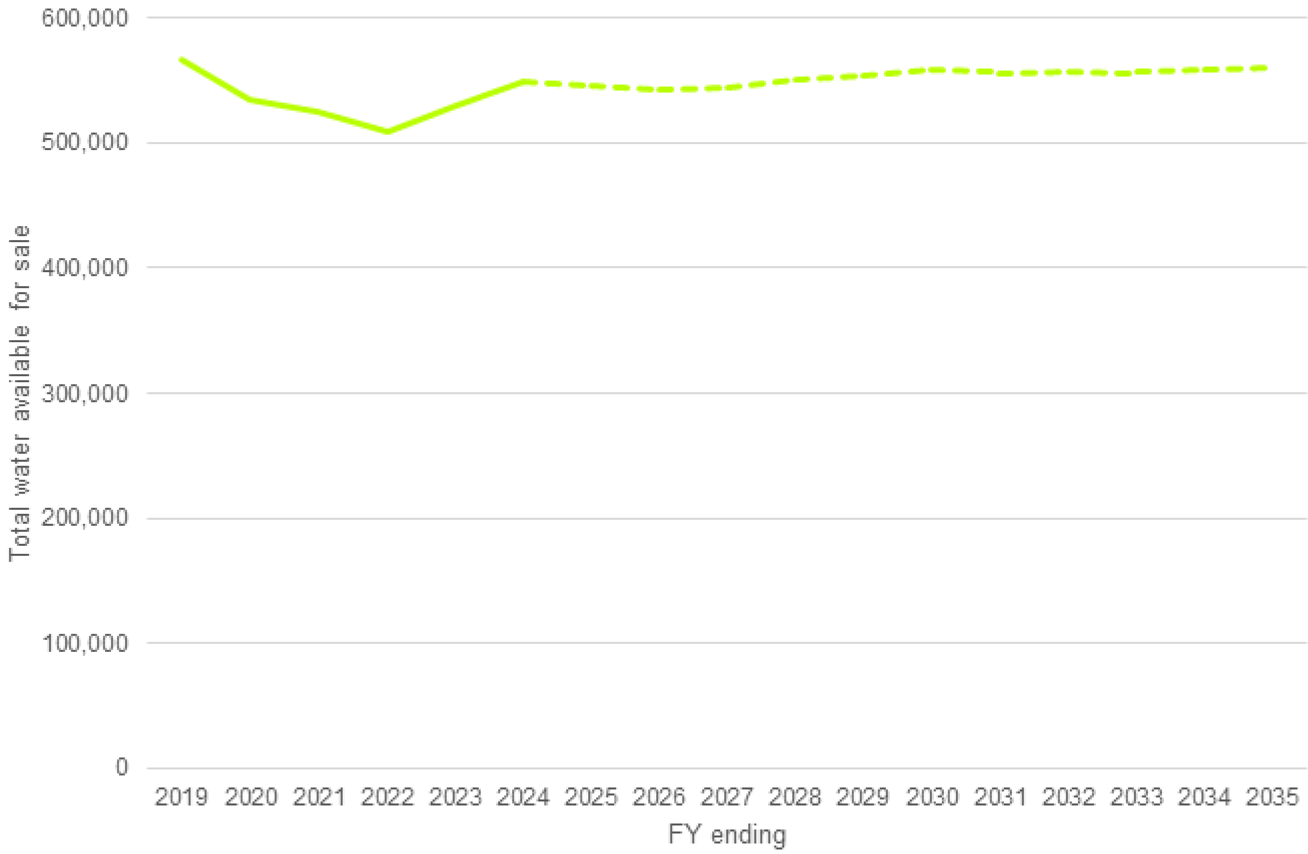
Sydney Water makes the case that the project is prompted by the following factors:

- Increased risk of flooding at Prospect WFP due to changes to the Australian Drinking Water Guidelines (ADWG), with more stringent requirements for turbidity. If individual filters exceed turbidity specifications, filters are taken offline and go through backwash cleaning. While filters are offline, Prospect WFP has limited ability to reduce or divert incoming raw water supply to Prospect WFP, increasing the risk of flooding.
- Expected population growth. *"Given the anticipated population growth and the current state of the plant, extended periods where Prospect WFP is required to produce drinking water beyond its warranted capacity are expected to be increasingly frequent in the future".*
- Increasing frequency of poor raw quality events is impacting capability, quality and supply. As part of this it also highlights the risks of disinfection byproducts with higher organic matter.

We note that Sydney Water's business case does not actually make the direct case that raw water quality events are more likely in future, but does address the potential for adverse water quality events to occur.

On the point about growth as a driver, whilst we understand that Greater Sydney's population is expected to increase, **Sydney Water's own projections do not incorporate large increases in volumes of water supplied,** presumably due to measures such as greater use of PRW, loss reduction and water conservation. As can be seen below, the business's projections for water volumes in FY35 is only 1.8% higher than in FY24 and is actually 1.3% below the level in FY19.

Figure 4-53 – Total volumes of water supply (not a significant increase)



Source: analysis of AIRSIR, based on 'Total water available for sale to own customers' which includes customer consumption and losses.

Sydney Water has divided the project into three packages:

- Package 1: New Pre-Treatment Plant: the business has carried out options analysis. This was estimated to cost c$644M at P50 in the Full Business Case.[51]
- Package 2: [redacted]
- Package 3: [redacted]

It has carried out a multi criteria analysis of two options (upgrade of the WFP and new pre-treatment plant) compared to a 'base case'. It has then considered two sub-options for the sizing of the pre-treatment plant and selected the smaller "Option 2b" which consists of a new 500 Ml/d pre-treatment plant.

It has also carried out a cost-benefit analysis (CBA) for these sub-options. The benefits are based primarily on the reduced frequency of risk of boil water notices (BWNs). This finds that both options are cost-beneficial. We note that:

- The benefits are assessed based on three potential causes for triggering a BWN: (i) demand limitations of the existing plant, (ii) further deterioration in water quality and (iii) "equipment failures and operational error". Because the probability (21% in any given year) calculated for any single event causing a BWN were obviously too high in the base case[52], the CBA adopted the approach of assuming that two events had to happen together to trigger a BWN. This highlights the uncertainties in the probabilities applied in deriving the CBA.
- The number of customers affected by BWNs are assumed to increase by 56% (households) and 79% businesses over the next 30 years (presumably because of growth)[53]. This seems unlikely without significant expansion of the WFP as it will not have capacity to supply such a significant increase.
- The CBA adopts a 'high growth' rather than the 'expected growth scenario' for the analysis of benefits, which increases the risks of BWNs (in both the base case and pretreatment options).
- It appears (though not fully clear) that the assessment generally assumes that the pretreatment plant is available to operate at capacity when called to run (whereas in reality there may be challenges at start up)[54]. This assumption favours the case for constructing a pretreatment plant.
- It does not take account of the potential impacts of a future transfer of PRW to Prospect Reservoir which may help to mitigate catchment-linked water quality risks.
- The CBA is not in itself an assessment of the case for a pretreatment plant in its own right but rather a wider package of works including pretreatment. Change in the "Equipment failures and operational error" (i.e. the non-pretreatment focus) make up a significant part of the benefits but are mainly due to the (much cheaper) upgrade works rather than the pre-treatment plant (as indicated by the fact that the probability is the same for both sizes of pretreatment plant considered).

It concludes that the benefit-cost ratio of the preferred solution (at P50) is 2.13. We acknowledge that all assessments of this sort have to make assumptions. However, for the reasons set out above we consider the assumptions made lean to favouring the pretreatment plant.

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[51] In $FY24 see Table 18, Cost-Benefit Analysis: Prospect Water System - Full Business Case
[52] compared to the fact that no BWNs have been issued since 1998, see Section 3.5 of "Cost-Benefit Analysis: Prospect Water System - Full Business Case"
[53] Table 8, Cost-Benefit Analysis: Prospect Water System - Full Business Case
[54] Section 4.3.2 of the Boil Water Notice Likelihood Analysis

We do not consider that this whole project falls in the 'very well justified, clearly has to happen now' category. The case for proceeding with it is as follows:

- There are potential benefits - the last few years have shown the potential for raw water quality to deteriorate.
- The investment would help to build resilience for future adverse water quality events. If climate change makes these events more likely then it could be more useful in the longer run than historical precedent would suggest.

The case against making the full investment is:

- The plant and business has demonstrated that is has survived a very adverse event without the need for BWNs. The business's own projections of demand volumes do not support significantly increasing risk from growth.
- This is a high capex (and opex) project. The CBA makes a number of assumptions which lend a positive slant to the pretreatment plant and there is (inevitably) significant uncertainty in the probability of BWNs. We suspect the economic case is much more marginal. Although not presented in the CBA, it is possible that many of the BWN benefits could be realised by the lower cost upgrades (as opposed to pretreatment) included within the project.
- We at first assumed that there would be additional benefits of pretreatment related to future proofing against disinfection byproducts standards being tightened in future[55]. However, the Full Business Case makes that point that *"the project won't cater directly for future THM limits, consideration is given to potential expansion needs".* Which appears to be a very minor benefit.

We have included **the full project in the 'upper' range. This would provide greater resilience to future raw water quality events.**

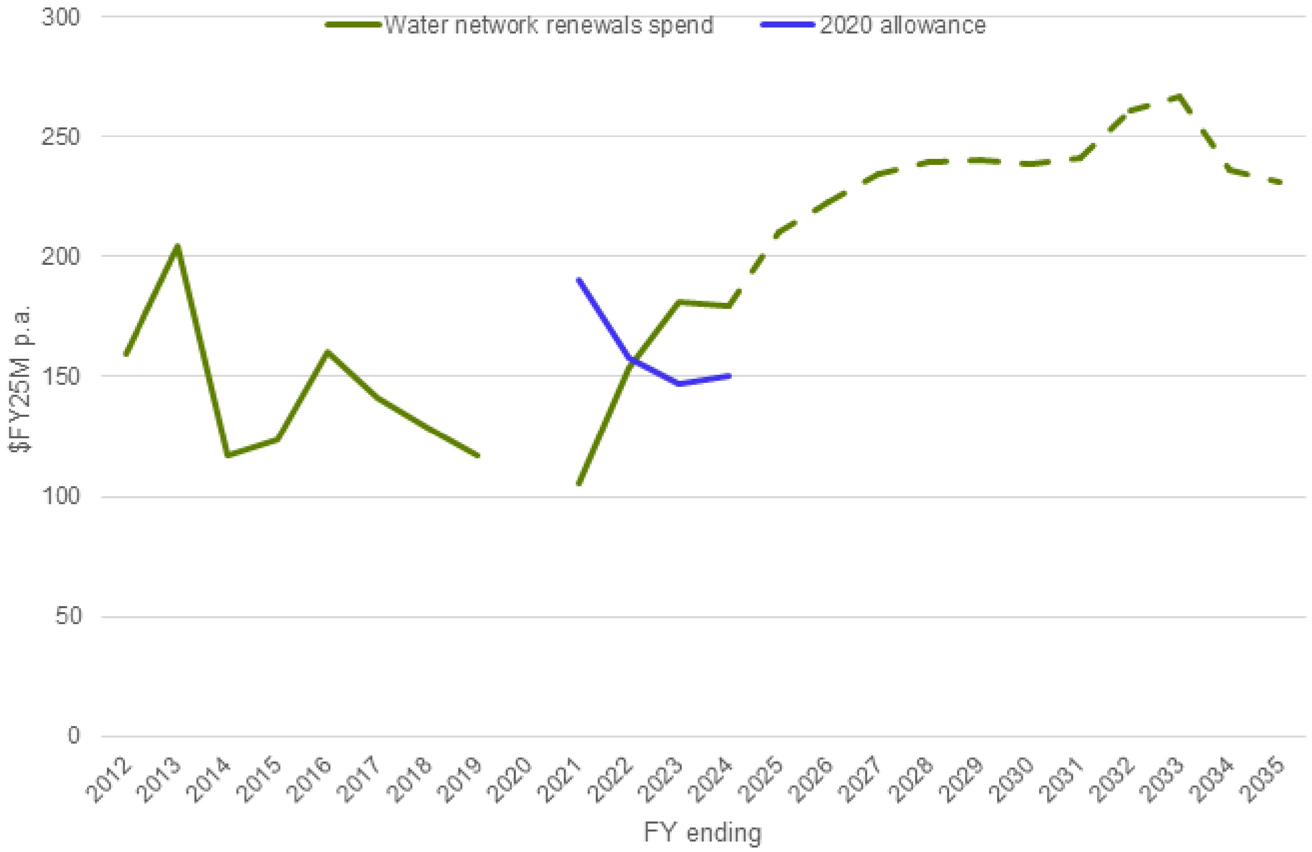
We have not made any specific allowance in the lower range, noting that the business has already demonstrated that it is capable of managing adverse water quality events.

4.6.3.3 Water Network overall (reservoir, critical water mains, retic water main, together, meters separate)

Expenditure on water network renewals in the 2020 Determination period was similar to the allowance (4% below) albeit more backended.

[55] Disinfection byproducts can be formed by the reaction of disinfectants react with organic matter

Figure 4-54 –Water network renewals expenditure

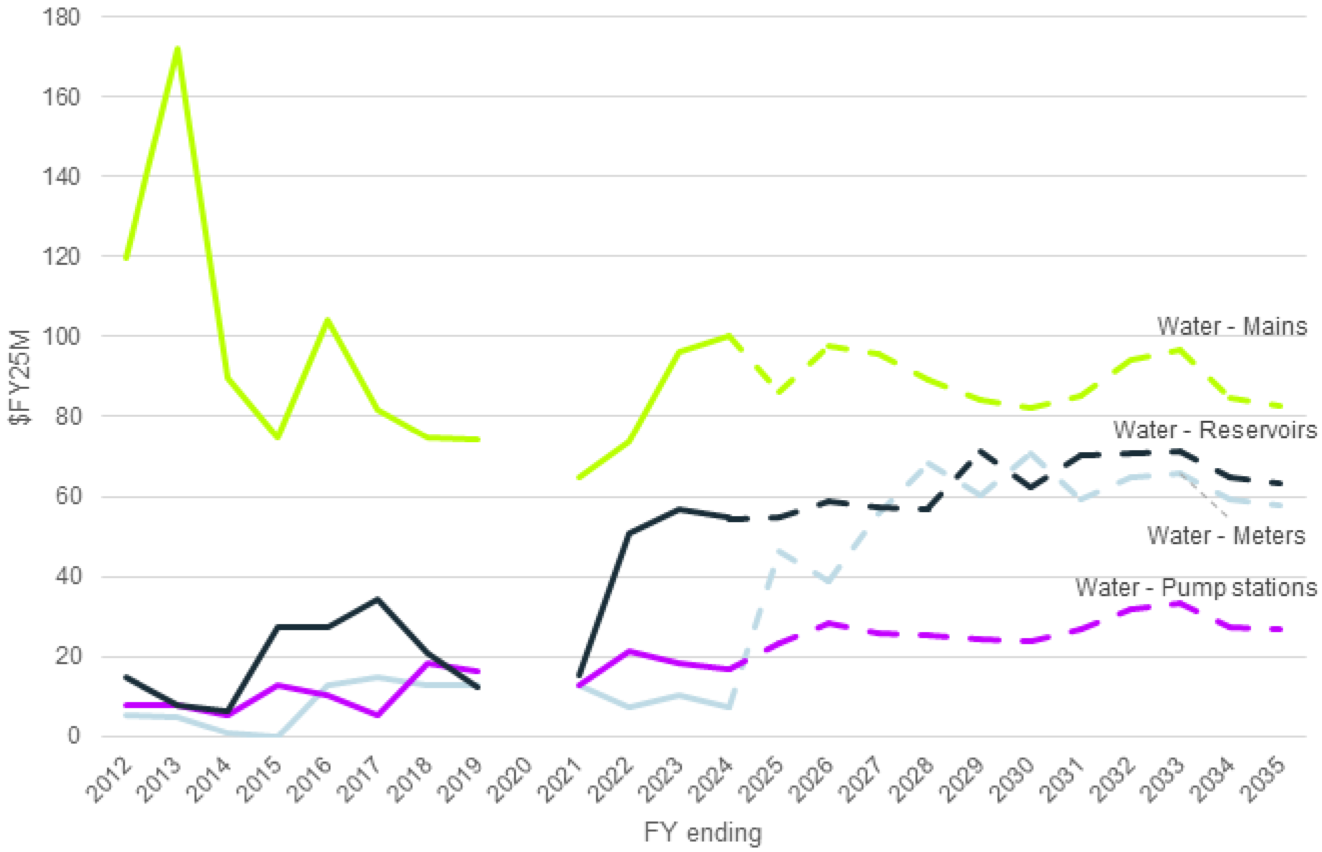


Source: analysis of RFI96 and 2020 AIRSIR

NB: expenditure from FY25 onwards is purely based on the RFI96 expenditure figures and does not incorporate the effects of the reconciliation adjustment which has not been allocated to renewals types.
NB2: FY12 to 19 figures are based on all 'existing mandatory standards' spend on non-WFP assets. We do not have this information for FY20.

The business has proposed increases in renewals for reservoirs and metering with a slight increase in pumping stations. Water mains renewals are proposed at a similar level or slightly lower than historical spend since FY14 (noting it was higher in FY12 and 13).

Figure 4-55 –Water network renewals expenditure by asset type



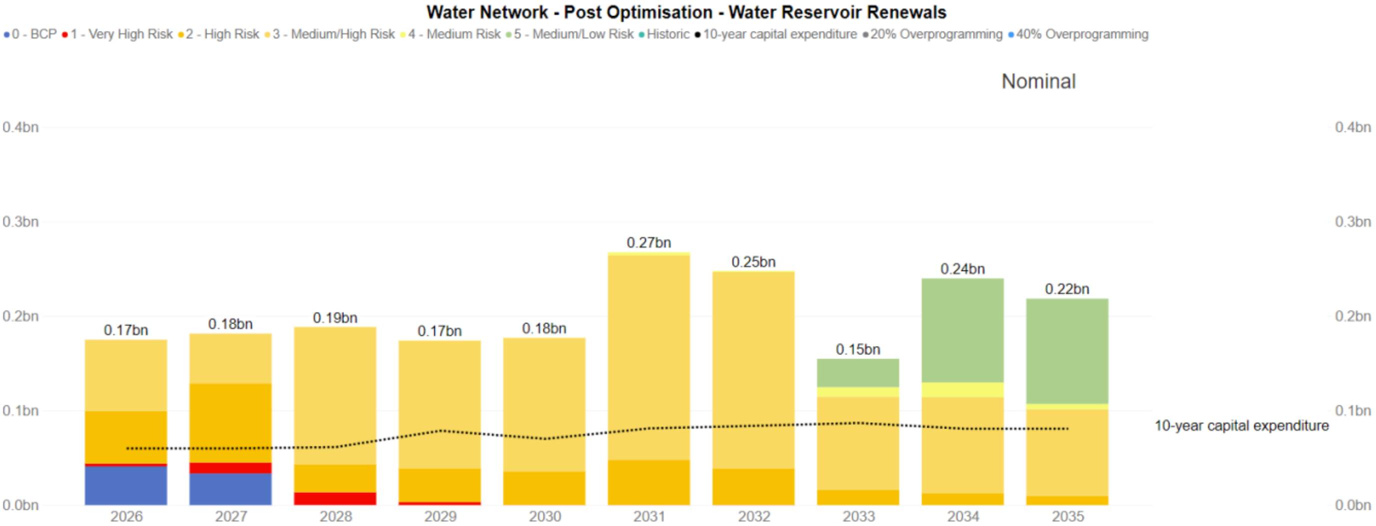
Source: analysis of RFI96 and 2020 AIRSIR
NB: expenditure from FY25 onwards is purely based on the RFI96 expenditure figures and does not incorporate the effects of the reconciliation adjustment which has not been allocated to renewals types.
NB2: FY12 to 19 figures are based on all 'existing mandatory standards' spend on non-WFP assets. We do not have this information for FY20.

We examine the proposed expenditure for the two biggest proposed increases, reservoirs and water metering, below.

Water reservoirs

The business has used the process outlined in Section 2.3.2 to assess the current and future risk of its assets and derive an unconstrained needs investment to which it has then applied adjustments. For water reservoirs the proposed expenditure appears to be approximately sufficient to renew all 'very high' and some 'high 2' assets in period to FY30.

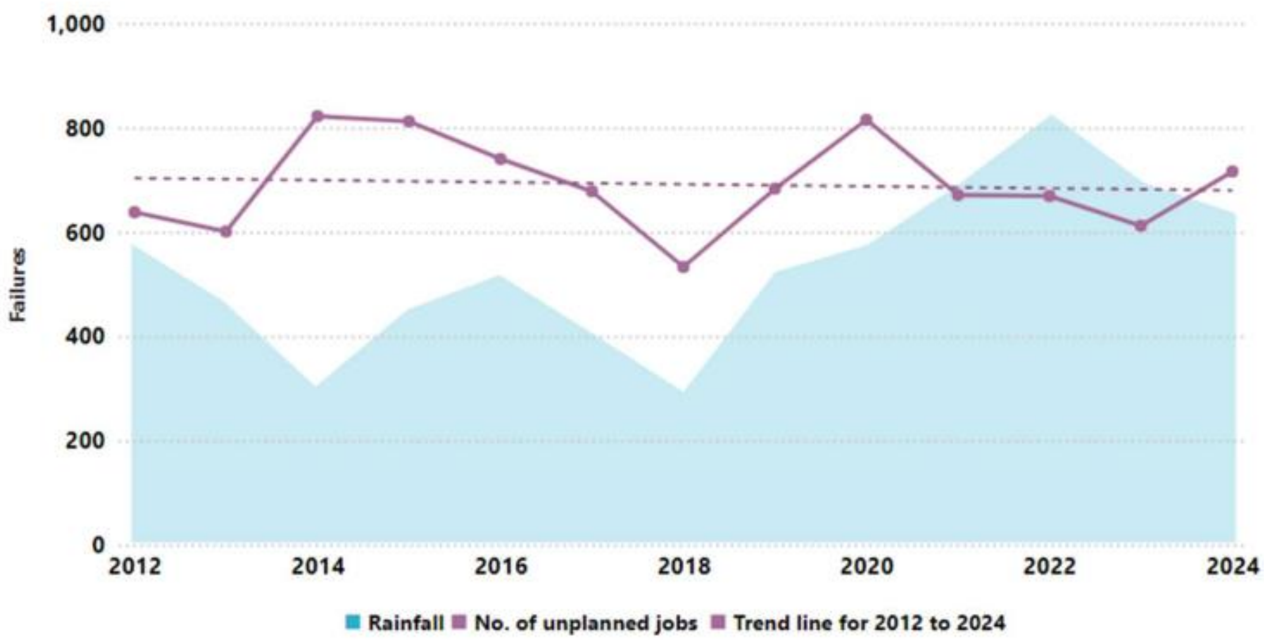
Figure 4-56 – Water reservoir asset risk levels and renewals expenditure



Source: Figure 20, Water Network Renewals Program Investment Plan 2025.

The business has provided a summary of unplanned jobs (assumed to be reactive work orders) by year as reproduced below. This suggests broadly stable asset failures.

Figure 4-57 – Water reservoir unplanned jobs by year

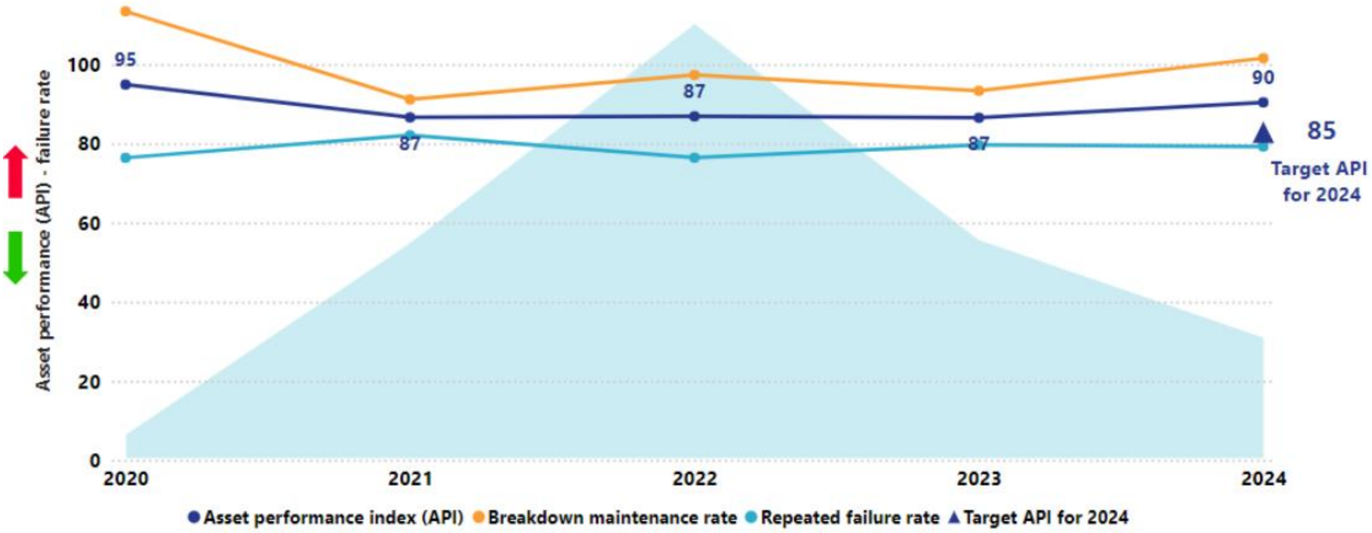


Source: Figure 4 in RFI 79, 84, 98, 99, 100, 103, 130, 135, 141, 142, 199

The 2024 State of the Assets report classifies water reservoir asset performance as stable in FY23 and 24 and improving on the five year trend[56]. This is supported by breakdown maintenance rate and repeat failure trends as shown below, noting that this is for reservoir and pumping station performance combined.

[56] Ref: Table 7 of State of the Assets Report FY24

Figure 4-58 – Water network facilities (reservoirs and pumping stations) asset performance



Source: State of the Assets Report FY24

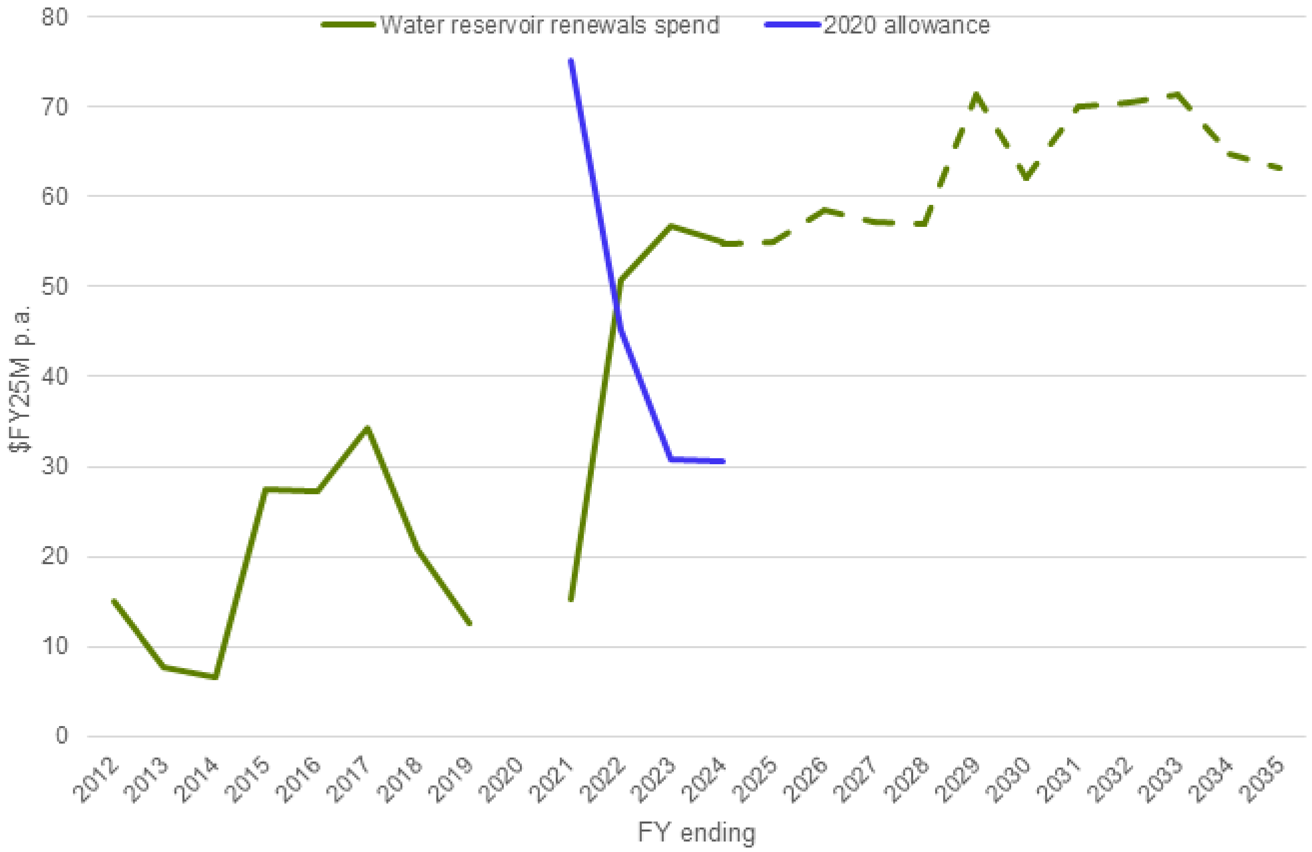
The program investment plan makes the point that reservoirs are critical for continuity of supply and for water quality. It makes the case that an increase in expenditure is required because of the weather in the 2020 period[57]:

> *The severe wet weather in the current period has led to an extensive backlog of both level 1 and 2 conditions assessments. Urgent renewals conducted to mitigate the impacts of weather conditions have led to planned works being deferred into Period 1. As such, there is a need for a 39% higher investment in reservoirs in Period 1, driven by the essential role they play in supplying safe, potable water to customers.*

The business did indeed spend less than the 2020 Determination allowance. However, it only spent $4M total or 2% less than the allowance with much of the spend happening at the end rather than start of the period.

[57] Water Network Renewals- Program Investment Plan

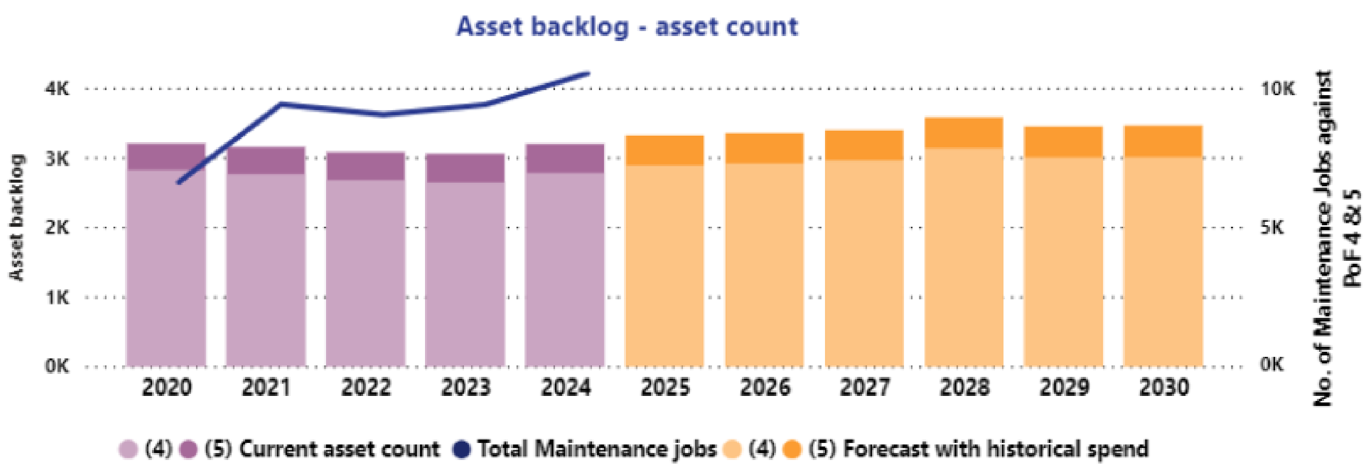
Figure 4-59 –Water reservoir renewals expenditure



Source: analysis of RFI96 and 2020 AIRSIR
NB: expenditure from FY25 onwards is purely based on the RFI96 expenditure figures and does not incorporate the effects of the reconciliation adjustment which has not been allocated to renewals types.
NB2: FY12 to 19 figures are based on all 'existing mandatory standards' spend on non-WFP assets. We do not have this information for FY20

The business's projections also suggest that the backlog reduced from FY20 to FY23 and will increase a little compared to FY24 at historical levels of expenditure as can be seen below.

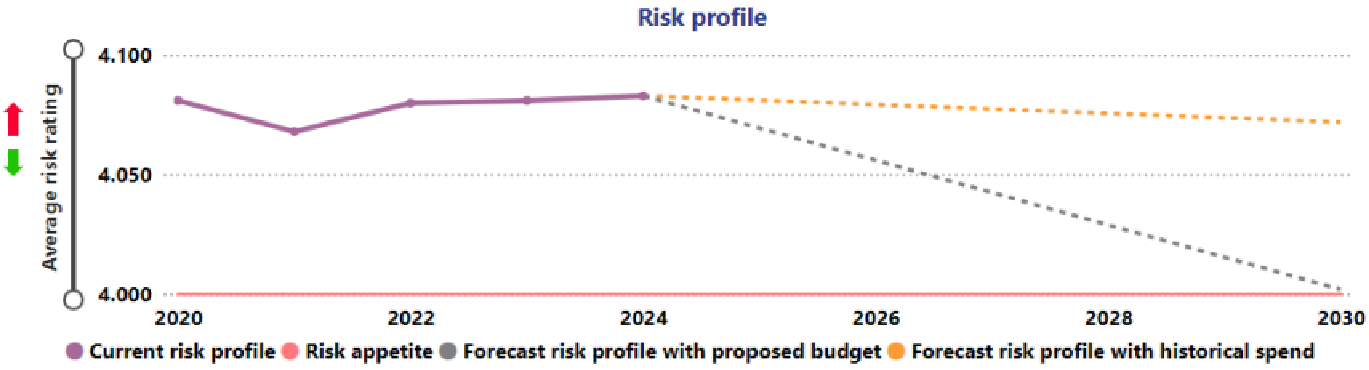
Figure 4-60 –Water reservoir asset backlog projections



Source: Sydney Water Presentation 4N

Based on the State of the Assets report the business expects risk levels for its water network facilities (reservoirs and pumping stations) to improve relative to current levels even with historical levels of spend as can be seen below.

Figure 4-61 – Sydney Water's projected improvement in water network facilities risk profile



Source: Figure 18, State of the Assets Report FY2024

We consider that the business has not made a strong case for an increase in expenditure for reservoirs compared to historical levels. Whilst it does project a small increase in backlog in future years, this has been roughly stable since FY20. Its projections suggest that risk levels will improve slightly if historical levels of expenditure are maintained. The business has not made the case that customers should pay more for reduced risk.

Water Metering

Sydney Water is proposing to spend $293M between FY26 and FY30 on customer meters and a further $307M in the following five years[58].

This proposed program is not about renewing existing assets on a like-for-like basis but rather a planned roll-out of digital smart meters with the wider benefits that these bring. The prime justification for the program is therefore a cost-benefit analysis (CBA) for its proposed shift to digital smart metering compared to a base case of like-for-like renewal.

Meter replacement has been on hold as this program has been under development. The project seeks to replace mechanical water meters with digital smart meters with >95% (1.6M meters) replaced by June 2035. It builds on trials in the Liverpool area between 2018 and 2023 and the initial production rollout between FY23 and FY24. A lot of thought has been put into roll out, the customer journey and delivery of the program.

At interview, the business presented a CBA whose benefits were focused on benefits to Sydney Water (e.g. revenue benefits). We asked that Sydney Water redo the analysis based on customer benefits only. This they did and summarised the assumptions and result in RFI 162. Based on the difference in total costs (totex) from FY26 to FY35 compared to like-for-like renewals, the revised analysis concluded that the program was only slightly cost-beneficial with additional totex of $289.6M compared to benefits over the same period of $290.1M. These costs and benefits are summarised below.

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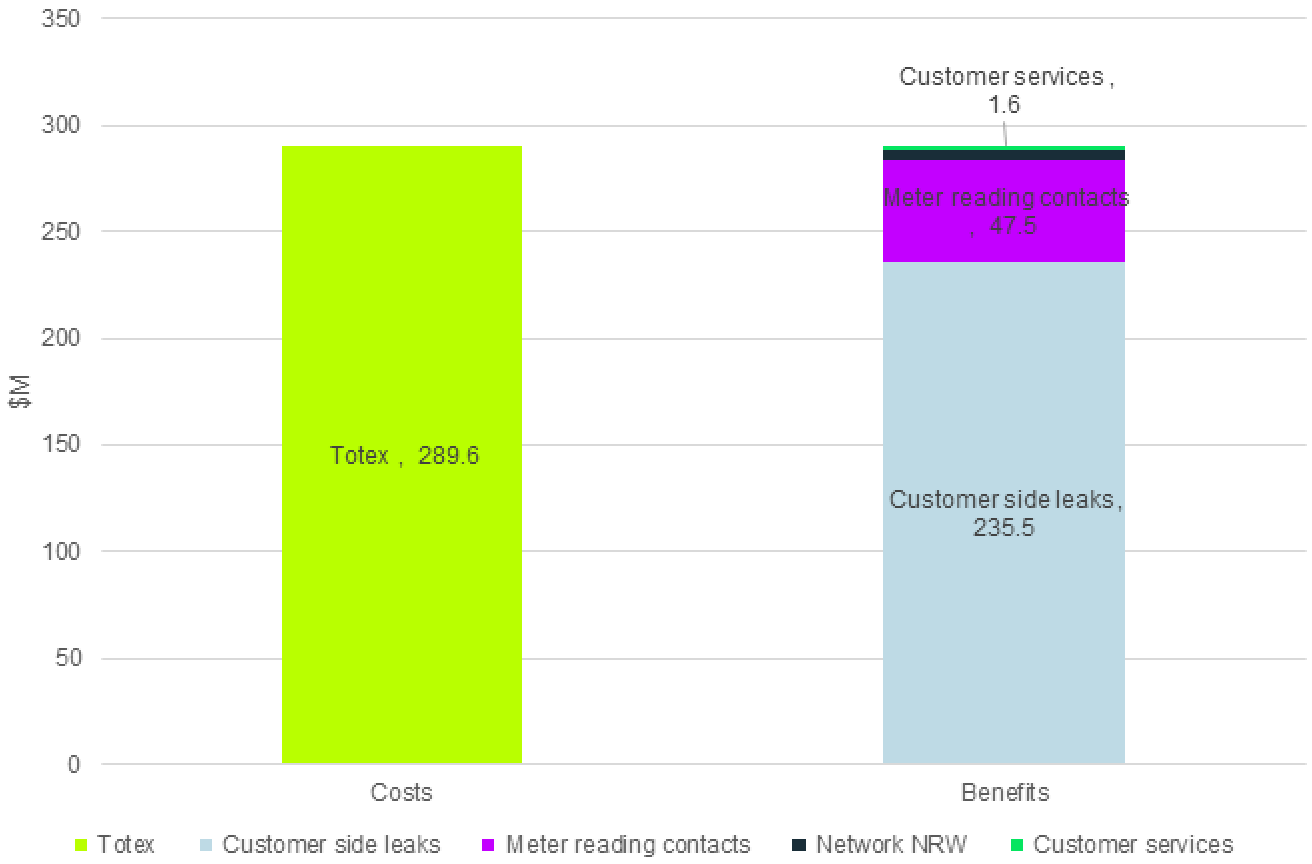
[58] Both from RFI96 and without any reconciliation adjustment

Figure 4-62 – Sydney Water's assessment of the costs and benefits of smart metring compared to like-for-like renewals



Source: Analysis of RFI162

We note that the robustness of the CBA is much improved since the initial version. It has not followed best practice in terms of setting out the longer term costs and benefits (including full lifecycle costs), using discounted values, ensuring that the benefits are fully captured in the pricing proposal and conducting sensitivity analysis.

At first glance it looks like an extremely marginal cost-benefit case for smart metering and interesting that in redoing a CBA benefits have been found which are just slightly greater than the costs being justified. However, **our view is more positive than this**. Both the costs and benefits have been derived based on a ten-year fixed window (to FY35). In reality the benefits should continue for much longer than this especially for the meters installed at the end of the ten year period. We would expect that extending the time horizon would add to the net benefit as benefits would be taken for lower costs with some initial costs not repeated or not needed until the end of the asset life.

We consider it likely that the program will be cost-beneficial for customers over the medium term. We have therefore **included it in the Upper range of expenditure**. Given that the smart metering element is not essential and could therefore be deferred we have identified it as a **potential service level adjustment of $218M for FY26 to 30 i.e. an expenditure level of $15Mp.a.**[59] or $75M in the FY26 to 30 period to allow for like-for-like renewals.

[59] Based on the assumption that expenditure will be slightly higher than the typical $13M p.a. meter renewal spend due to the lower level of renewals in FY22 to 24

We have considered the opex costs and benefits arising from the smart metering program in Section 3.4. We note that if the Tribunal decides to adopt the service level adjustment and not allow for the smart metering capex elements of the program the **opex will also need to be adjusted to remove both the opex costs and savings.**

4.6.3.4 Our view

Sydney Water has proposed a significant increase in expenditure mainly associated with the pretreatment program but also with water metering, WFP renewals and water network facilities such as reservoirs and pumping stations.

WFP general renewals

We are not convinced that the full amount of expenditure proposed is required. As with many other renewals programs Sydney Water has not made the case that asset risk is too high and customers should pay to reduce it.

Our approach to defining the upper and lower range for WFP general renewals is set out below.

Table 4-23 – Expenditure range for WFP general renewals

	Sydney Water proposal	Not strongly justified this period	Upper range	Lower range
Approach	Initial identification of unconstrained backlog removal adjusted to reflect affordability and deliverability	Asking customers to pay to reduce risk.	Highest annual spend level (FY24) which gives an uplift on historical spend levels to help to stabilise asset deterioration.	Historical average expenditure (based on FY21 to 24)
Expenditure (based on RFI96) (pre-efficiency challenge)	$274M from FY26 to FY30 or $55M p.a.	n/a	$25M p.a.	$14M p.a.
Risks	Large programs of renewals on live WFPs can be complex leading to delays.		This is only an estimate. It is hard to know what the appropriate level of renewals is to maintain stable risk. Not all risks are visible from asset risk assessments and performance data.	Risk position of assets may deteriorate over time based on the business's modelling
Advantages	Reductions in risk associated with asset failure at WFPs		Greater than average historical spend should reduce asset-associated risk. The business has demonstrated it can deliver at this scale before.	No significant advantages beyond customer bills

Source: Analysis of RFI96

Pretreatment

We reviewed the largest of the proposed pretreatment projects (Prospect) and found that, whilst there are potential benefits for future adverse water quality events, the project does not fall into the 'very well justified, clearly has to happen now' category.

We note the delays in implementing the Nepean WFP upgrade project and the challenges in securing resources for that project. **We consider it unlikely that it would be prudent and efficient for the business to deliver all of the pretreatment projects listed in parallel rather than carrying out the works that (a) are demonstrably within the capability of its supply chain and (b) allow the business to learn lessons as it goes and roll out in the program in an iterative, continually improving and staged way.**

This view also appears to be partly reflected in the business's SIR through the adjustments it has applied. Whilst it has provided a list of many pretreatment projects it plans to undertake in the program business case and RFI96, it has included $734M in SIR Capex 2a for FY25 to FY30 for 'Nepean Water Filtration Plant' ($170M) and 'Water Filtration Plant Renewals' ($564M). This last line appears to include both WFP general renewals (discussed above) and the pretreatment capex for all plants except for Prospect (under a separate line as it is classified as 'Compliance' not renewals). Netting off the general WFP renewals spend from RFI96 ($305M) in entirety as it does not have an associated adjustment, suggests that SIR Capex 2 incorporates the following capex for pretreatment for FY25 to FY30:

- $170M for Nepean WFP (includes some upgrades);
- $697M for Prospect WFP;
- $259M of unspecified pretreatment capex (inferred).

Given our view that a staged approach makes sense, from both a delivery capability and lessons-learned perspective, we have assumed in the 'upper range' that the business delivers the ongoing Nepean WFP program and the Prospect and Orchard Hills projects. For the 'lower range' we have assumed it only delivers the Nepean WFP program given that there is no fixed statutory deadline or similar.

Our approach to defining the upper and lower range for the pretreatment program is set out below.

Table 4-24 – Expenditure range for pretreatment

	Sydney Water proposal	Not strongly justified this period	Upper range	Lower range
Approach	Large program derived then subject to very significant adjustments (remaining scope unclear)	Unclear what the remaining unspecified pretreatment capex relates to	Assumes that Orchard Hills would be the other prioritised facility	Just the ongoing Nepean WFP program deferring/reappraising the case for the other facilities.
Expenditure (pre-efficiency challenge)	FY25 to FY30 totals: Prospect: $697M (compliance) Nepean: $170M Other: $259M	n/a	Prospect: $697M (compliance) Nepean: $170M Orchard Hills: $222M	Nepean: $170M
Risks	Pretreatment is designed to deal with specified parameters. Future water quality incidents may differ from assumptions. Working on live operational facilities		As per Sydney Water proposal. Omission of Cascade WFP may increase risk in the Upper Blue Mountains Delivery of improvements at three facilities in parallel could be challenging Less learning from experience than doing the works sequentially.	Does not improve preparedness for future adverse raw water quality events The likelihood of these events may increase with climate change.
Advantages	Improves ability to deal with future adverse water quality events		As per Sydney Water proposal.	Opportunity to learn from the Nepean WFP program before wider roll out.

Source: Analysis of AIR/SIR and RFI96. NB: these figures include Prospect pretreatment which is classified as 'compliance' in SIR Capex 2 not renewals

Water reservoirs

The business has proposed an increase in expenditure especially focused on water reservoirs.

We consider that the business has not made a strong case for an increase in expenditure for reservoirs compared to historical levels. Sydney Water's projections suggest that risk levels will improve slightly if historical levels of expenditure are maintained. The business has not made the case that the asset risk is too high and that customers should pay more to reduce it.

Table 4-25 – Expenditure range for water reservoirs

	Sydney Water proposal	Not strongly justified this period	Upper range	Lower range
Approach	Initial identification of unconstrained backlog removal adjusted to reflect affordability and deliverability	Asking customers to pay to reduce risk.	Average spend in FY21 to 24	Upper range minus 20% to account for the projection that risk will reduce at historical levels of spend
Expenditure (pre-efficiency challenge)	$305M from FY26 to FY30 or $61M p.a.	n/a	$44M p.a.	$36M p.a.
Risks	n/a		Not all risks are visible from asset risk assessments and performance data. This may especially be the case with civil structures which make up a significant part of reservoirs	As per upper range but with no reduction in risk delivered in period The 20% reduction is only a top down estimate. It is hard to know what the appropriate level of renewals is to maintain stable risk
Advantages	Reductions in risk associated with asset failure		According to Sydney Water's projections risk will reduce at historical spend levels	Customer bills

Source: Analysis of AIR/SIR and RFI96

Water meters

The business has proposed a significant program of replacement of current 'dumb' meters with smart meters. As set out in Section 4.6.3.3, we consider it likely that the program will be cost-beneficial for customers over the medium term and have included it in the Upper range of expenditure. Given that the smart metering element is not essential and could therefore be deferred we have identified it as a potential service level adjustment leading to an expenditure level of $15M p.a. or $75M in the FY26 to 30 period to allow for like-for-like renewals. This approach is set out below.

Table 4-26 – Expenditure range for water meters

	Sydney Water proposal	Not strongly justified this period	Upper range	Lower range
Approach	Coherent plan for roll out of smart metering	n/a	No change- likely cost beneficial for customers	Estimate of the straightforward meter renewals (no smart elements)
Expenditure (pre-efficiency challenge)	$292M from FY26 to FY30 or $58M p.a.	n/a	No change	$15M p.a.
Risks	Technology deployment and customer journey are keys to success and may delay implementation, increase costs or achievement of objectives		As per the proposal	Customers do not receive the benefits from the program
Advantages	The company has identified significant potential benefits, many of which we have reflected in opex.		As per the proposal	No significant advantages beyond customer bills this period

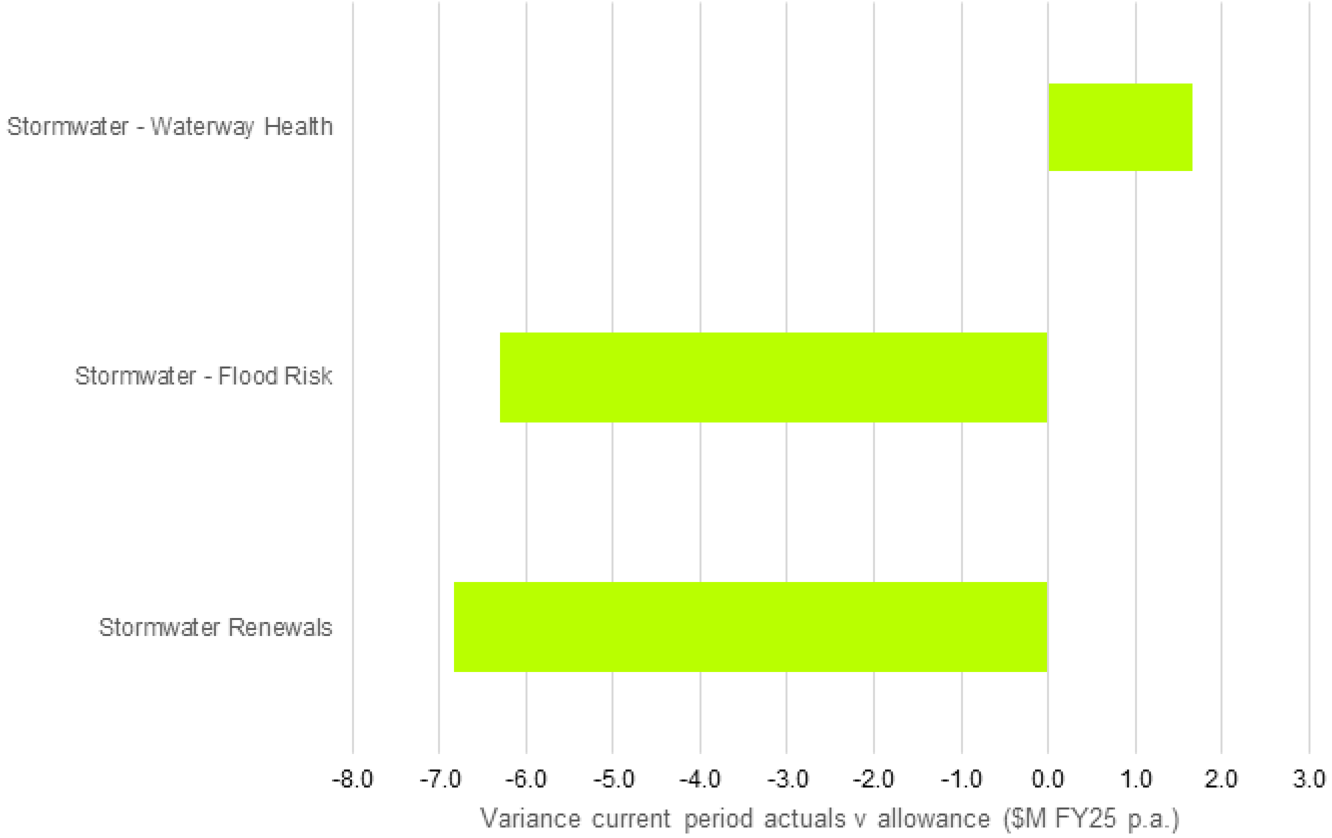
Source: Analysis of AIR/SIR

4.6.4 Stormwater renewals

This section looks at Sydney Water's proposed stormwater renewals expenditure. Some of the documents seen (e.g. RFI 96 and the stormwater program investment plan) class 'waterway health' as an improvement driver. However, only $3M or 1% of FY26 to FY30 stormwater capex in SIR Capex 2 has been allocated to improvement with all of the rest treated as renewals. We treat the SIR as the single point of truth for reconciling differences. We have therefore reviewed all significant proposed stormwater expenditure, including waterway health, as if it is renewals expenditure in this section.

Sydney Water spent less than its allowance for stormwater renewals as can be seen in the negative variances for stormwater renewals and flood risk below.

Figure 4-63 - Variance between stormwater renewals allowance and expenditure in the 2020 Determination period

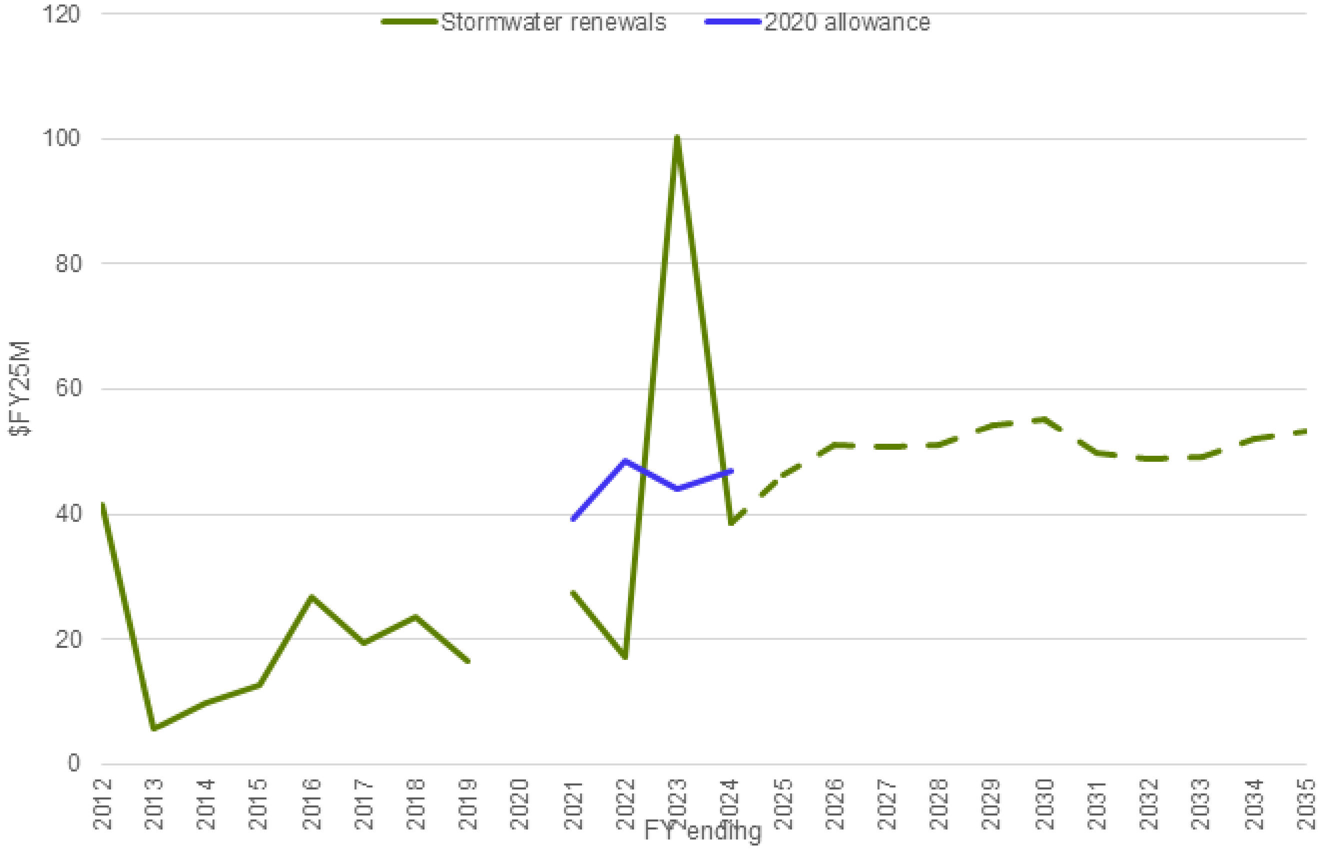


Source: Analysis of RFI96[60]

The business is proposing an increase in expenditure compared to the 2020 Determination period as shown below.

[60] Note that whilst RFI96 refers to waterway health as ‘improvements’ rather than ‘renewals’ SIR Capex 2 appears to treat this cost as renewals so we examine it here.

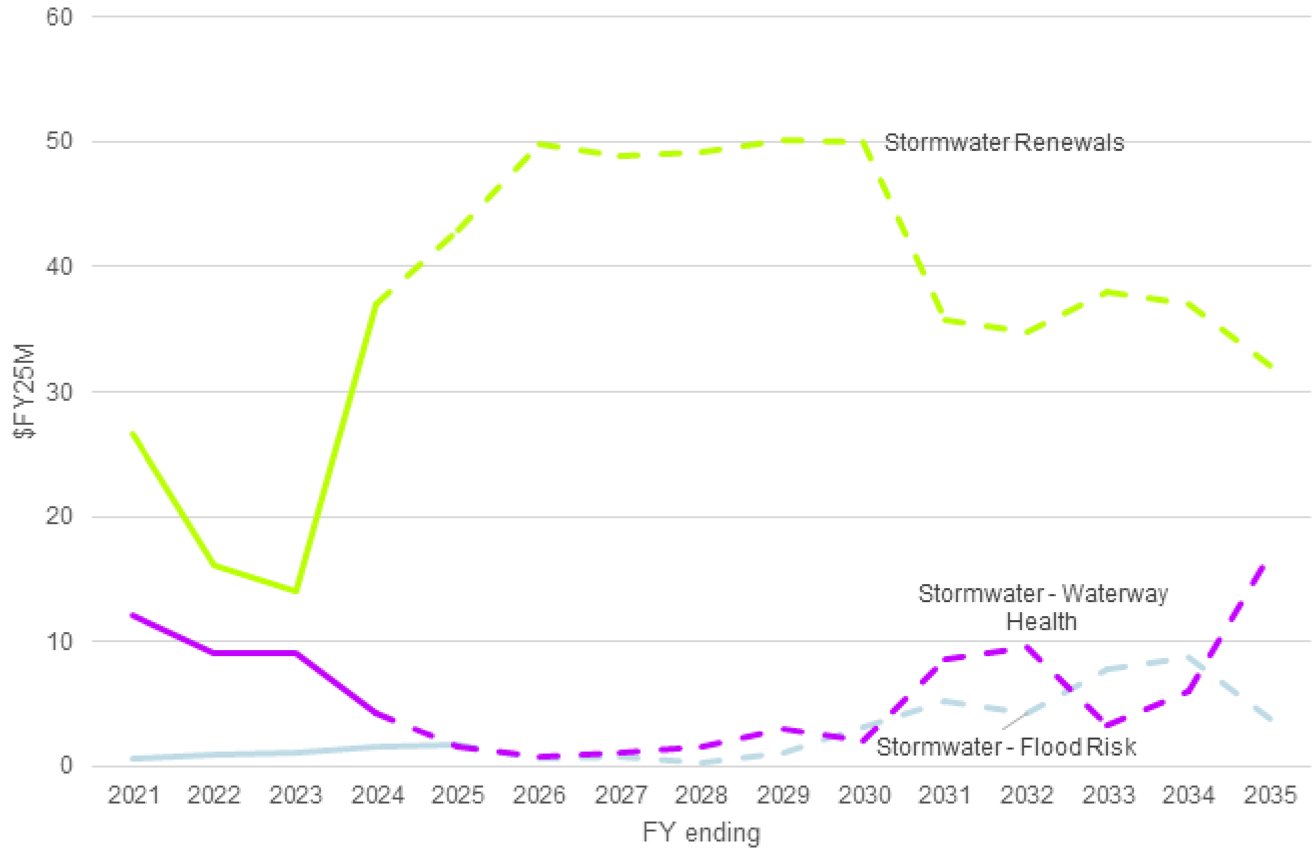
Figure 4-64 – Stormwater renewals expenditure



Source: analysis of 2020 AIRSIR
NB2: FY12 to 19 figures are based on all 'existing mandatory standards' spend. We do not have this information for FY20

The increase appears to be largely driven by increased expenditure on general stormwater renewals with a reduction in waterway health and small change in flood risk.

Figure 4-65 –Stormwater renewals expenditure by initiative



Source: analysis of RFI96 (historicals) and AIRSIR (projections)
NB: expenditure from FY25 onwards is purely based on the RFI96 expenditure figures and does not incorporate the effects of the reconciliation adjustment which has not been allocated to renewals types.

The business has carried out a similar exercise to that outlined in Section 2.3.2 to assess the current and future risk of its assets albeit presented differently as seen below. The proposed expenditure is sufficient to mean that there are no assets expected to be at 'very high' risk at the end of FY30 and fewer assets classed as 'high' risk assets.

Figure 4-66 – Current and proposed future stormwater asset risk levels

Current State (FY2026) by Asset Length (m)

	Rare	Very Unlikely	Unlikely	Possible	Likely	Very Likely
Extreme	-	-	-	-	-	-
Critical	-	-	-	-	-	-
Major	-	176,025	34,368	27,083	28,933	284
Moderate	-	68,187	8,996	2,899	4,992	820
Minor	-	6,542	629	504	844	1,673
Minimal	-	1,641	180	73	290	530

Future State (FY2030) by Asset Length (m)

	Rare	Very Unlikely	Unlikely	Possible	Likely	Very Likely
Extreme	-	-	-	-	-	-
Critical	-	-	-	-	-	-
Major	-	189,776	34,368	24,768	17,782	-
Moderate	-	69,353	8,996	2,558	4,261	726
Minor	-	6,744	629	357	844	1,618
Minimal	-	1,711	180	73	282	468

Source: Presentation 5C

The 2024 State of the Assets report provides less information on stormwater than for wastewater and water. However, it classifies stormwater asset condition as green in FY22, 23 and 24 for all asset types (gravity, naturalised channels and wetlands)[61].

Figure 4-67 – Stormwater asset condition

Product	Class	Baseline Feb 2020 (Baseline)	Jun 2022	Jun 2023	Jun 24
	Recycled Water Meters	■	■	■	■
Stormwater	Gravity channels	■	■	■	■
	Naturalised channels	■	■	■	■
	Wetlands	■	■	■	■

Source: State of the Assets Report FY2024

The business makes the point that additional renewals are required “to address the deterioration caused by extended and forecasted La Niña events, as well as required replacement of existing legacy assets”[62]: However, it is not clear to us how the business has decided where to ‘draw the line’ i.e. which risk level assets to renew and which not to renew. It has also provided less information on backlog or risk levels than for water and wastewater.

As can be seen in Figure 4-66, the business is proposing to reduce the overall levels of risk of its stormwater assets. **The business has not justified why customers should pay more to reduce the level of risks facing its stormwater assets which it already classifies as in ‘green’ condition**. We therefore consider that the business has not justified the proposed increase in expenditure. We have allowed for the **historical levels of expenditure in both the upper and lower range of expenditure.**

4.6.4.1 Our view

Our approach to defining the upper and lower range for stormwater renewals is set out below.

[61] Tabl1 10, State of the Assets Report FY24
[62] Stormwater Program Investment Plan

Table 4-27 – Expenditure range for stormwater

	Sydney Water proposal	Not strongly justified this period	Upper range	Lower range
Approach	Initial identification of unconstrained backlog removal adjusted to reflect affordability and deliverability	Unclear what the justification is for the increased expenditure	FY21 to 24 average except for waterway health which is based on what Sydney Water has asked for (the average is higher)	No different to the upper range. Sydney Water has asked for less than historical for waterway health.
Expenditure (pre-efficiency challenge)	FY25 to FY30 totals: Flood risk: $8M ($1M p.a.) Waterway health: $10M ($2M p.a.) Renewals: $291M ($48M p.a.)	n/a	FY25 to FY30 totals: Flood risk: $6M ($1M p.a.) Waterway health: $10M ($2M p.a.) Renewals: $141M ($23M p.a.)	No change from Upper.
Risks	May be affected by weather events		Not all risks are visible from asset risk assessments and performance data. This may especially be the case with civil structures which make up a significant part of stormwater assets.	No change from Upper.
Advantages	Undertaking work when conditions allow (i.e. clement weather) may improve resilience to future weather events.		Consistent with asset condition indicators.	No change from Upper.

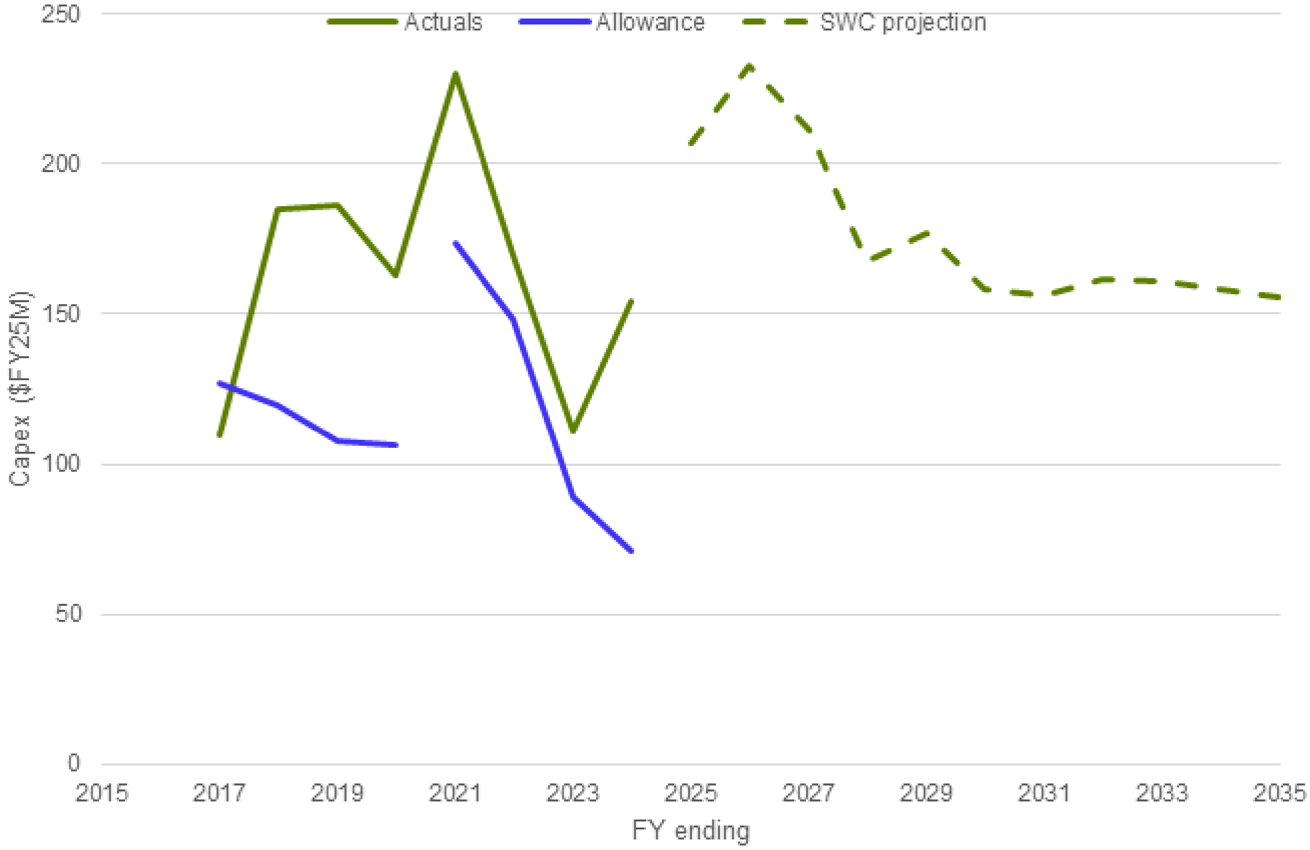
Source: Analysis of AIR/SIR.

4.7 Corporate capex

Sydney Water has spent an average of $166M p.a. in the current Determination period (FY21 to 24) on corporate capex. This is a similar level of expenditure to the previous period (FY17 to 20) which saw an average $161M p.a.

Sydney Water overspent its corporate capex allowance in both of the previous periods by approximately $46M p.a. and is proposing a 14% increase compared to the current period actuals, with an average spend of $189M p.a. proposed.

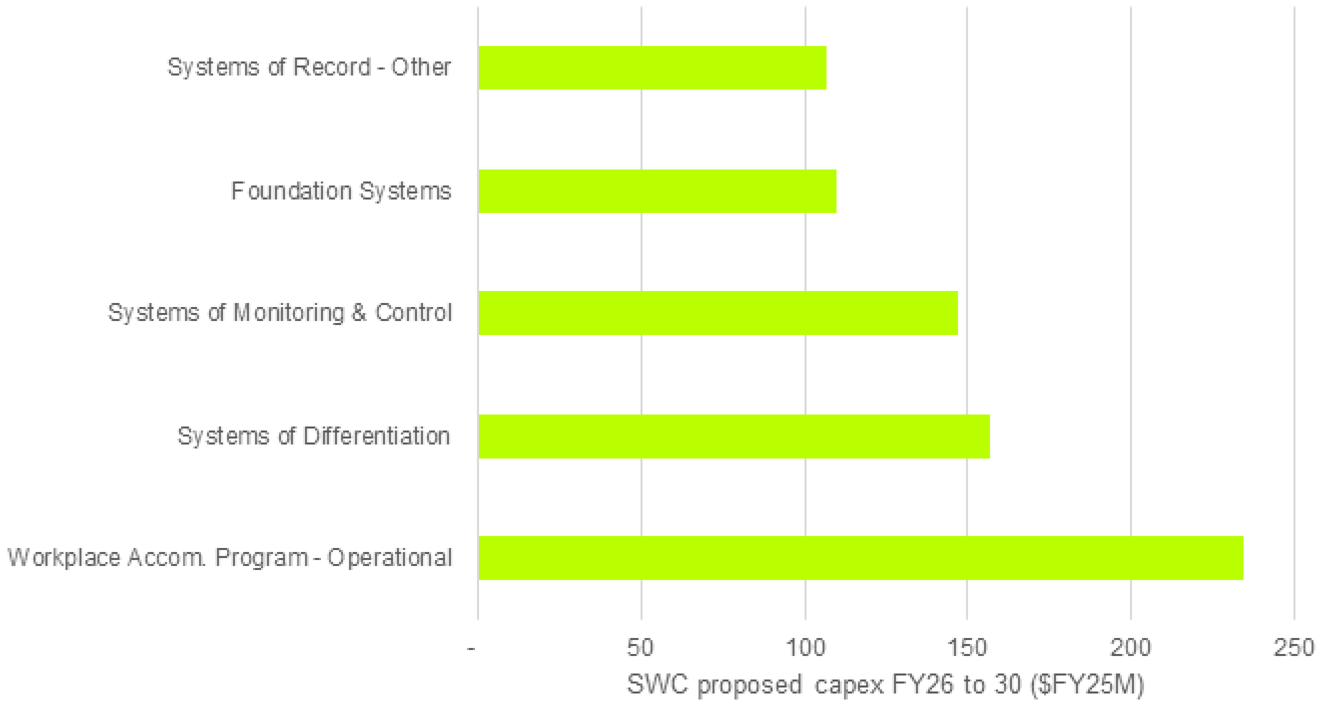
Figure 4-68 – Corporate capex expenditure



Source: analysis of AIR/SIR

Digital expenditure makes up the majority of the proposed expenditure (55%) with workplace accommodation being the other large element.

Figure 4-69 - Sydney Water proposed corporate capex by initiative



Source: Analysis of AIR/SIR (initiatives >$100M only)

Property related capex is discussed below. The digital program is examined in detail in Sections 4.7.2 and 4.10.5.

4.7.1 Property capex and opex

Sydney Water is proposing a step change in both capex and opex expenditure compared to its spend in the four years that IPART allowed for in the last price review for 2026 to 2030. In fact, the step change in the level of capex expenditure starts in FY25 when it is forecast that Sydney Water will outturn 106% more in this year than it spent in the four previous years, and for opex the increase is 112% more than the average actuals or 39% more than the IPART allowance from the previous four years.

Table 4-28 – Property total expenditure ($FY25M)

	IPART allowance	Actual spend	Variance	*Interim Year*	Future price path					
Period	FY21 to FY24			*FY25*	FY26	FY27	FY28	FY29	FY30	Total
Capex total	49.6	**57.9**[63]	8.3	119.2	136.4	95.6	50.6	48.2	49.9	**380.7**
Opex total	181.0	**119.0**	-62.0	63.0	68.5	72.4	75.8	78.7	83.3	**378.7**
Totex	**230.6**	**176.9**	**-53.7**	**182.2**	**204.9**	**168.0**	**126.4**	**126.9**	**133.2**	**759.4**

Source: Property Presentation on 29th November 2024 and updated with RFI 284 for real prices in FY25

Comparisons over the five year periods translate into an overall increase of 111%.

Table 4-29 – Comparison between price paths for Property total Expenditure ($FY25M)

Property Totex	2021-25	2026-30	$M Difference	% difference
Capex	177.1	380.7	203.6	115%
Opex	182.0	378.7	196.7	108%
Total	359.1	759.4	400.3	111%

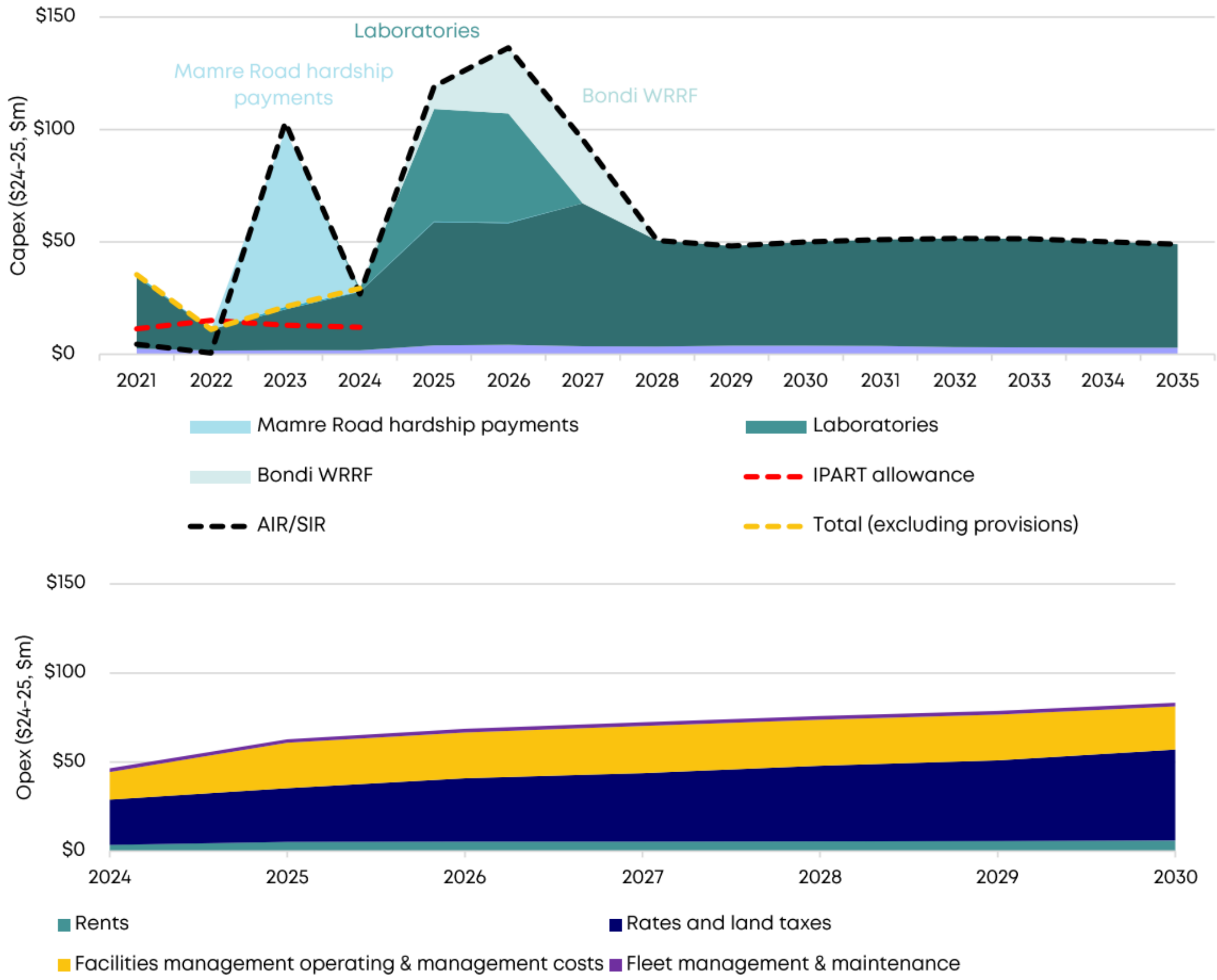
Source: Property Presentation on 29th November 2024 and RFI 284

The following chart provided by Sydney Water illustrates:

- the capex peaks in investment including the hardship payments excluded from our analysis. It does suggest that these are "once in a generation" investments from FY25 to FY27 rather than representing a new norm.
- the opex trend broken down against the four key drivers.

[63] We have excluded from the Capex actual spend total under Acquisitions as we believe this distorts the analysis. This relates to Hardship acquisitions for Mamre Road and the Aerotropolis, which was not part of the IPART allowance and should be considered as a special case. This money was allocated in 2022 for early acquisitions due to hardship cases emerging from land being reserved for "stormwater infrastructure" under State environmental planning policies Hardship claims can occur when a property is designated for acquisition resulting in the landowner being unable to sell their property or unable to sell it at the market value; or when the landowner is required sell the property without delay. At the time of writing there has been $22M of spend on acquiring properties and there is a provision against this line as expenditure will potentially be incurred for the foreseeable future.

Figure 4-70 – Property capital expenditure and operational expenditure charts



Source: Combined responses to RFIs 239, 240, 244

Sydney Water provided the following explanations for the charts:

- For capex, total expenditure in FY21 to FY24 in the above graph (yellow dotted line) differs to the property capex to be added to the RAB per the AIR/SIR (black dotted line). This is because the AIR/SIR records provisions intending to be paid down over multiple years as a capital investment in the year the liability is recognised in the general ledger. These figures capture when capital was expensed, and hence added to the RAB. The total expenditure line compares actual capital investment over the period, adjusting for actual payments made from provisions, not changes to the provisions themselves. This approach provides a better outline of Sydney Water's actual level of capital investment each year over the current period for clearer comparison with the proposed future investment and avoids confusion created by negative adjustments to provisions made prior to FY21.
- For opex, investment line items pre-SAP and pre-restructure have been allocated to a single program within the property portfolio. In contrast, these investment line items may have achieved objectives across multiple programs. This means the allocation of costs pre-FY24 are indicative only. This does not affect total capital expenditure for the portfolio.

At the last review, we concluded: *There were no material issues identified with the Property program. It appears to be effectively and efficiently managed and prioritised in order to keep within the IPART Determination.*

The very significant increase in expenditure from FY25 onwards may suggest that the previous statement was not accurate, and that Sydney Water has been storing up significant problems which impact on compliance and staff welfare and now require immediate action. The business responded that:

> *…it is acknowledged that for several previous IPART periods, Sydney Water has maintained a position that 'existing maintenance funding is sufficient for a growing and aging asset base' and that any additional needs will be met by efficiencies. A strategic reset has taken place over the last five years where these previous assumptions have been questioned in terms of sustainability and suitability for the step change in capacity and performance…For facilities and property, the shift in investment and assessment has followed behind operating asset investment which has been prioritised due to the more immediate risk to licence compliance…..* [the new approach has]…*resulted in identification of a significant number of potentially non-compliant assets.*

The capex increases are driven by a range of factors which we broadly concur with based on evidence from condition and compliance assessments alongside a more rigid application of existing standards, new standards and/or increased scrutiny around bushfire, workplace standards, biosecurity, electrical safety, and security.

Key capex items are:

- $44.5M capex (and $60M opex) for the new laboratory facility over the life of the 10 year lease, or ~$30M opex in the next price period);
- $68M for Bondi Water Resource Recovery Facility (WRRF) which failed to meet the needs of the workforce and required urgent attention;
- $32M for mitigating bushfire risks through conducting landscaping works and vegetation management;
- $21M for security including amendments to the Security of Critical Infrastructure Act (SOCI);
- $16M relating to fire systems upgrade;
- $13M for electrical compliance;
- $13M for heating, ventilation and air conditioning systems compliance, predominantly to support operational assets (switch rooms and data centres).

The largest item of operational expenditure is the $213M in non-controllable costs for rates and land taxes, with significant year on year increases from $25M in the FY24 base year to $51M by 2030. The proposed step changes in opex relate to:

- $25M rental costs for the new laboratory;
- $20M for Property Optimisation linked to disposal of property assets;
- $18M for step funding to achieve 'Natural area and green infrastructure land' performance measure targets, to ensure compliance with the Biosecurity Act and to address the ISO14001 audit findings in relation specifically to managing sites in line with Property Environmental Management Plans.
- $13M increase in Facilities Management costs for commercial sites which include Ashy Ave, Potts Hills, Homebush, CBD, and Parramatta offices. The increase relates to backlog response for maintenance requests and ensuring adequate maintenance provisions are maintained.

Our main areas of challenge were around the decision making to opt for a lease compared with the new build option for the new laboratory. The need is not in question, but our initial comparison of the similarity between the capex costs for the new build compared with the capex and opex costs associated with the lease made this worthy of further investigation. The capex associated with the lease has more than doubled since the optioneering was carried out[64]. This would have some impact on the Net Present Cost (NPC) and Net Present Value (NPV) analysis although Sydney Water argues that the capex for the two new build options could have increased by the same proportion for the same reasoning. We have considered:

- the NPC and NPV data;
- the high divestment proceeds realised by unlocking existing labs space at West Ryde;
- the efficient use of capital investment which allows Sydney Water to deploy resources to other projects;
- the shortest overall delivery duration and impact on operations through delivery.

Overall, we are satisfied that this appears to be prudent decision to select the lease option. We are making some adjustments as Sydney Water's submission reflects the new build placeholder capex value ($98.6M), which is considerably in excess of the revised value ($44.5) capex requirements and also the opex profile has changed slightly. The cost has already escalated and we do not believe the high level of additional contingency has been justified so we propose to cap the expenditure at the mid point of $41M (a reduction of $3.5M).

There is also good news on Bondi Water Resource Recovery Facility as the $68M assumed in the submission is now forecast to outturn at $44M, a significant reduction which requires adjustment.

This represents the upper range scenario, with a total capex budget of $299M. For the Lower range scenario, we are proposing that the capex could be reduced by a further 10% on the basis that it does not represent the most efficient cost. This appears to be a bottom up build up with no evidence of working within a constrained budget. This is in contrast to the way that the digital capex was developed, where we could see evidence of prioritisation to keep within an agreed budget envelope. This results in a further reduction of $30M to $269M, but would still represent a 55% increase on the previous five years.

[64] Cost is October 2023 estimated as $20.6M to $21.2M range, Business Case in June 2024 $36.4M without contingency, $43.8M with contingency (assumed to be in $23-24 prices) and $44.5M as per RFI 241 to 243 responds ($24-25 prices).

Table 4-30 – Recommended property capex scenarios

Area	Sydney Water proposal	Not strongly justified in period	Upper range scenario	Lower range scenario
Approach	Based on earlier estimates for Lab and Bondi WRRF	Adjustments for latest projections from Sydney Water and reduction in Lab contingency	Adjustments for latest projections from Sydney Water and reduction in Lab contingency	Further 10% reduction
Expenditure (pre-efficiency challenge)	$381M	-$81M	$299M	$270M
Risks		See Upper range scenario	Small risk that Lab contingency is not sufficient but sends message that budget needs to be managed tightly as costs have already increased significantly from earlier estimate	Further deterioration at sites and some “nice to have” but not mandatory outcomes cannot be achieved
Advantages		See Upper range scenario	Upper range now reflects latest costs	Still represents a significant increase and should be sufficient to address all non-compliances

For operational expenditure, we are unconvinced by the scale of the costs, at $20M, for Property Optimisation linked to disposal of property assets. Sydney Water stated that:

The costs relate to 5 additional FTEs to develop and implement optimisation strategy and other project costs - professional Services to optimise property portfolio, legal fees and associated cost, project management fees and consultant fees, valuation fee and agency fees and planning advise and assessments costs. The costs of this initiative are anticipated to be offset through the disposal (sale) of property assets. RFI 239, 240 and 244

It appears somewhat congruous that the initiative would not generate considerably more revenue than the costs. We have reviewed an earlier business case (Optimise the Property Portfolio, dated July 2023) and we believe it should be possible to deliver a similar outcome in the next price path for the same level of investment as previously, so we propose to reduce this item to $10M in the upper range scenario.

For the lower range expenditure scenario, a service change adjustment could be made in relation to the $18M that Sydney Water has proposed for step funding to achieve ‘Natural area and green infrastructure land’ performance measure targets, to ensure compliance with the Biosecurity Act and to address the ISO14001 audit findings. Compliance with the Biodiversity Act is not discretionary, and should be ringfenced, but we think a proportion of the other costs can be removed or deferred as they are non-essential activities. We suggest that $7.5M ($1.5M p.a.) is a viable amount.

Table 4-31 – Recommended property opex scenarios

Area	Sydney Water proposal	Not strongly justified in period	Lower range scenario	Upper range scenario
Approach	Staff, core and step change costs	Property Optimisation	Service change adjustment	Reduction in Property Optimisation
Expenditure	$378.7M	$10M	$361.2M	$368.7M
Risks			Not achieving as many 'Natural area and green infrastructure land' performance measure targets or addressing all Property Environmental Management Plans ISO14001 recommendations	May impact amount of disposals
Advantages			Compliance with the Biosecurity Act is not at risk	Similar to previous level of spend, and will promote prioritising disposals based on best returns and/or most benefits

Table 4-32 - Proposed property opex adjustment

Property opex	2026	2027	2028	2029	2030	Total 2026 to 2030
Water	7.7	8.2	7.5	7.5	6.7	37.5
Wastewater	4.3	4.5	4.3	4.4	4.0	21.4
Stormwater	0.2	0.2	0.2	0.2	0.2	1.0
Corporate	0.0	0.0	0.0	0.0	0.0	0.0
Sydney Water STEP change	**12.2**	**12.9**	**12.0**	**12.1**	**10.8**	**59.9**
Water	6.4	6.8	6.3	6.2	5.6	31.3
Wastewater	3.6	3.8	3.5	3.6	3.3	17.8
Stormwater	0.2	0.2	0.2	0.2	0.2	0.8
Corporate	0.0	0.0	0.0	0.0	0.0	0.0
Proposed Upper range STEP change	**10.1**	**10.7**	**10.0**	**10.0**	**9.0**	**49.9**
Water	5.4	5.8	5.3	5.3	4.7	26.6
Wastewater	3.0	3.2	3.0	3.1	2.8	**15.1**
Stormwater	0.1	0.1	0.1	0.1	0.1	**0.7**
Corporate	0.0	0.0	0.0	0.0	0.0	**0.0**
Proposed Lower range STEP change	**8.6**	**9.1**	**8.5**	**8.5**	**7.7**	**42.4**

Source: SIR and Sydney Water Proposal

4.7.2 Digital capex

Digital capex is reviewed in detail in Section 4.10.5 with specific capex recommendations set out in Section 5.4.1.

4.7.3 Allocation of corporate capex

Sydney Water's proposed allocation of corporate capex is notably different to its allocation of corporate opex, with water receiving approximately 20% less corporate capex than its share of corporate opex for example (and the opposite effect for wastewater).

Table 4-33 – Sydney Water's proposed allocation of corporate costs

	2025	2026	2027	2028	2029	2030
Water						
Share of corporate opex	57%	61%	61%	61%	60%	60%
Share of corporate capex	40%	40%	40%	40%	40%	40%
Wastewater						
Share of corporate opex	42%	37%	37%	38%	38%	39%
Share of corporate capex	59%	59%	59%	59%	59%	59%
Stormwater						
Share of corporate opex	1%	1%	1%	1%	1%	1%
Share of corporate capex	1%	1%	1%	1%	1%	1%

Source: Analysis of AIR/SIR

In response to an RFI[65] about corporate capex allocation, Sydney Water states:

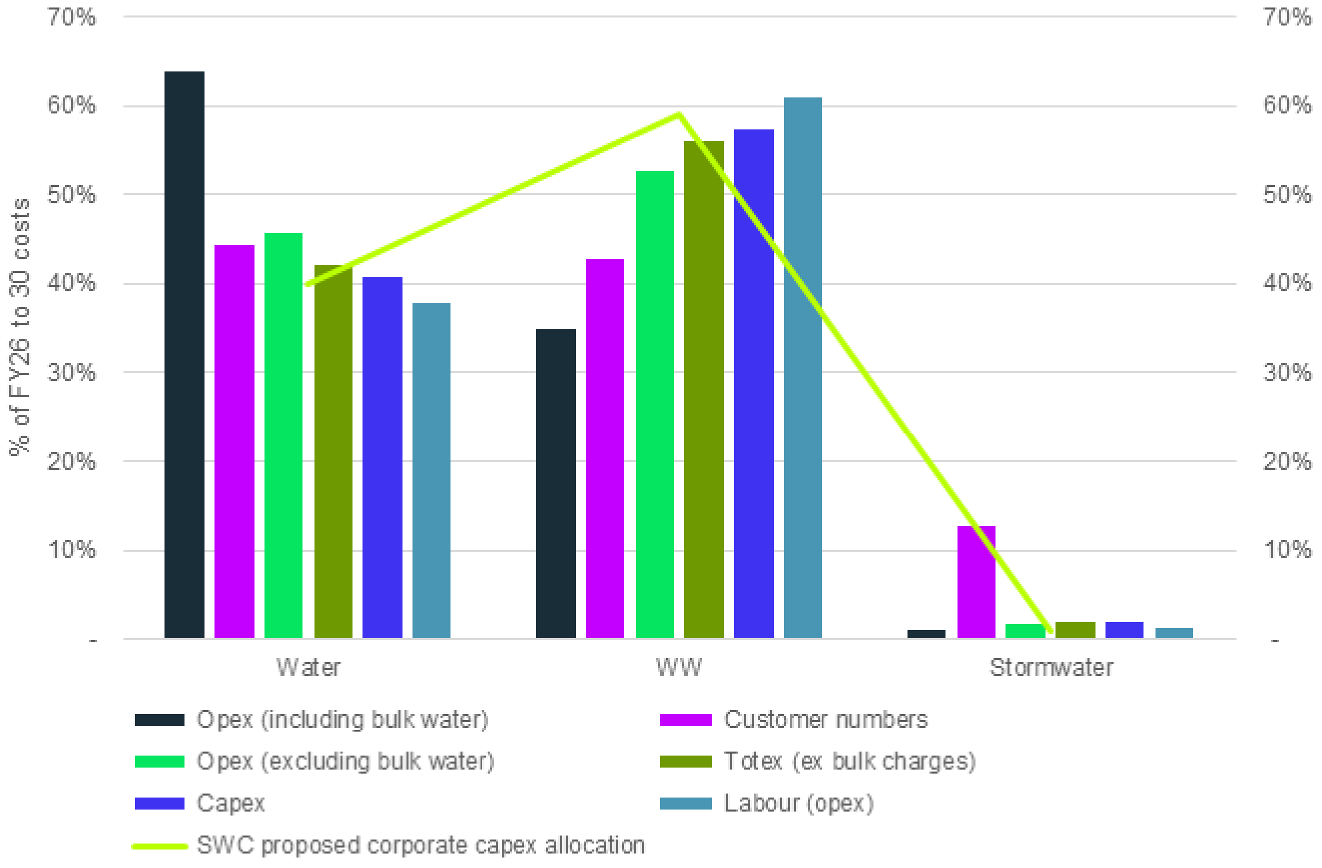
> *This allocation has been used by IPART in prior regulatory periods (since 2012) and broadly represents the size comparison of the average of the total 2025-30 Annual Revenue Requirement (ARR) and the July 2025 Opening Regulated Asset Base (RAB) balances for our Water, Wastewater and Stormwater Products.*

It is not clear to us that opening RAB is a causal allocator for corporate costs which are made up mainly of digital and workplace accommodation costs.

We have examined potential alternative, more causal, allocators including labour opex (as a proxy for FTEs), customer numbers, opex and totex as summarised below.

[65] RFI 223

Figure 4-71 - Proportion of costs by service



Source: Analysis of AIR/SIR

We conclude that, whilst RAB does not appear to be a strong indicator Sydney Water's proposed allocation of corporate capex is reasonably consistent with the proportions of labour, customers, capex and opex (excluding bulk supply costs) faced by each service. As such, **we have not made any amendments to Sydney Water's proposed corporate capex allocation.**

4.8 Compliance

Based on the coding in the SIR the compliance driven expenditure consists of three programs:

- Prospect Treatment;
- Wet weather overflow: $289M from FY25 to FY30;
- Wet weather surcharge: $97M from FY25 to FY30.

The Prospect Treatment line relates to the proposed pretreatment project which has been reviewed in Section 4.6.3.2. We discuss the wet weather overflow expenditure below. We have not reviewed the proposed wet weather surcharge expenditure in any detail.

4.8.1 Wet weather overflow abatement

This program relates to source control measures (inflow and infiltration management and misconnections from private properties) to abate the likelihood and impacts of wet weather overflows.

Sydney Water spent less than its allowance for stormwater renewals as can be seen below. Sydney Water has classed all of the projects in the 2020 Determination period as 100% complete with benefit assessment in progress but is expecting to achieve slightly more than the points set out in the EPL. It therefore classes the lower expenditure in the 2020 Determination period as savings[66].

The business is proposing an increase in expenditure compared to the 2020 Determination period albeit at a lower level of expenditure than the 2020 allowance.

Figure 4-72 - Wet weather overflow abatement expenditure

Source: analysis of RFI96 and 2020 AIRSIR

As of July 2024 a new regulatory approach and targets are coming into force in the form of a new regulation. The previous system was points-based whereas the new system is based on reducing the (theoretical) volumes of overflow from Category 1 discharges, i.e. the top 10% of high risk discharges. The target set is 3.6% reduction in by June 2030.

This approach has been developed jointly by Sydney Water and the EPA using a risk-based approach which has focused efforts on 386 Category 1 sites based on the impacts of overflow and the benefits for public health and waterway users. We understand the logic behind the program (e.g. targeting, modelling and targets) has been driven largely by Sydney Water.

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[66]Sydney Water presentation 4O

We consider that the risk-based approach taken to developing the program is a positive development in reinforcing the cost effectiveness of the measures i.e. the impact on the environment and water users relative to expenditure.

Sydney Water has good experience of delivering these source control measures and is planning on delivering the works using the Regional Delivery Partners (RDPs). This allows it to benchmark between partner costs and performance.

Our view is that this is a well-tailored program which Sydney Water has good experience of delivering and which is likely to deliver material benefits to the environment and water users. It is also now a stated requirement in the EPL. We have therefore included it in the Upper range of costs.

We also note that with a change in regulatory operating environment (i.e. if the new regulation were withdrawn) the expenditure would not be an obvious requirement except partially to meet the 'no deterioration' EPL condition (i.e. to offset the effects of growth which might otherwise make overflows worse over time). As such we have only included 20% of the costs as an allowance to meet this lower requirement. Note that this is a very high level top down adjustment as we do not have an alternative basis to quantify the expenditure.

We note that the sum of the 'project estimate total cost (P50)'s in the three DABCs provided to us, all dated October 2024 sum to $243M. We have therefore applied this estimate to the upper range.

Table 4-34 – Expenditure range for wet weather overflow abatement

	Sydney Water proposal	**Not strongly justified this period**	**Upper range**	**Lower range**
Approach	Program developed with the EPA,	SIR Capex 2 figure is higher than latest cost estimates	Based on the latest cost estimates	Assumes 20% of the budget to achieve the 'no deterioration' EPL criterion
Expenditure(pre-efficiency challenge)	FY25 to FY30 total $289M or $48M p.a.	-$46M	FY25 to FY30 total $243M or $41M p.a.	FY25 to FY30 total $49M or $8M p.a.
Risks	As source control advances it generally becomes harder to find quick wins.		As per Sydney Water proposal.	This is just an estimate. Overflows may cause significant damage to the environment and water users. The likelihood of these events may increase with climate change.
Advantages	Sydney Water and its partners have good experience		As per Sydney Water proposal.	Customer bills

Source: Analysis of AIR/SIR and RFI146

4.9 Improvements

Sydney Water has proposed an average of $19M per annum in the period from FY26 to FY30 against a single initiative called 'Wastewater Assets Sewer' classified as pipelines/network asset category.

We have not reviewed proposed 'improvements' expenditure in any detail given that it makes up 0.5% of the proposed capital program.

4.10 Recommended expenditure scenarios

4.10.1 Types of adjustments applied

The adjustments presented in the sections above represent a range of different types of adjustment. The only one not explicitly applied is the efficiency adjustment and broader expenditure profiling to take account of capacity to delivery which are discussed in Sections 4.10.2 and 4.10.3 below.

Table 4-35 - Adjustments applied in defining the range of capex

Element	Description	Examples/application to capex
(i) Scope adjustments	Adjustments for: - Activities / projects that could be considered outside the scope of the regulated service including costs driven by any unregulated activities and/or activities that do not directly relate to the regulated service. - Activities/projects not sufficiently certain to go ahead or lacking strong justification in period - Errors or omissions - Reflect more realistic external driver assumptions	Most of the adjustments applied for expenditure considered 'not strongly justified this period' in the tables above fall into this category. However, some of these adjustments, especially for the growth program, reflect more realistic costing and expenditure profiling so fall into the 'efficiency adjustments' category.
(ii) Efficiency adjustments	- Removal of inefficiencies: removal of duplication, removal of operational inefficiencies, savings from bundling of activities, more realistic costing assumptions/removal of gold-plating - More realistic expenditure profiling - Application of efficiency challenge	As above. Also see below the discussion of efficiency adjustments.
iii) Service level adjustments:	- Remove all remaining deferrable and non-essential activities/projects to provide the Tribunal flexibility to balance service level and affordability considerations.	Deferral of planned pretreatment schemes and reduced digital spend resulting from benchmarking
iv) Potential savings from changes in key external assumptions	- Amend key assumptions driving expenditure such as levels of growth and asset risk	Lower growth assumptions and levels of renewals spend accepting greater risk.

Element	Description	Examples/application to capex
(v) Potential savings opportunities from reforms to operating environment (policy, legislative, regulatory)	To allow IPART to advise on potential savings from reforming existing policy, legislative and regulatory requirements.	These have been identified for one of the 'compliance' projects as set out in Table 4-34.

Source AtkinsRéalis and discussions with IPART staff

4.10.2 Efficiency

For growth capex, Sydney Water is assuming a level of efficiency that appears to be in line with their procurement proposals, which equates to around 9% to 10% for the larger programs of work. This has been included in the Portfolio adjustments entered separately into the SIR. In addition we identified a further 1.5% delivery efficiency as part of our scheme analysis, which we have included into the upper bound scenario.

For other drivers our view, is that efficiency has not clearly been built into capex, especially given that many of our recommended ranges are based on historical expenditure. We have therefore **applied a continuing efficiency challenge of 0.7% p.a. (cumulating) to non-growth capex**. This continuing improvement element of efficiency, termed 'Frontier Shift', relates to the increased productivity derived from process innovation and new systems and technology that all well-performing businesses should achieve. The level of efficiency challenge applied has been chosen to be consistent with the Australian Productivity Commission multi-factor productivity analysis and efficiencies as applied to other water utilities in New South Wales previously.

This has been applied to both the upper and lower range of non-growth capex.

4.10.3 Capacity to deliver

Sydney Water is seeking to increase the size of its capital program significantly. Even if the adjustments described within this report are applied, the level of capital delivery across the price control period will be at a higher average level than previously achieved. Their ability to deliver is therefore an important consideration when determining the price control, particularly if the program is to be efficiently delivered. Our review of their capacity to deliver consisted primarily of interview questions, supported by some wider analysis of cross sector infrastructure expenditure within NSW.

Sydney Water has demonstrated increasing maturity in procurement and program delivery, particularly in relation to major projects (mainly growth related) and regional level delivery strategies. They have provided a reasonable case that their corporate capacity and supply chain will be able to deliver an increased rate of capex spend. This included evidence from recent tenders that demonstrated access to new Tier 1 and 2 suppliers.

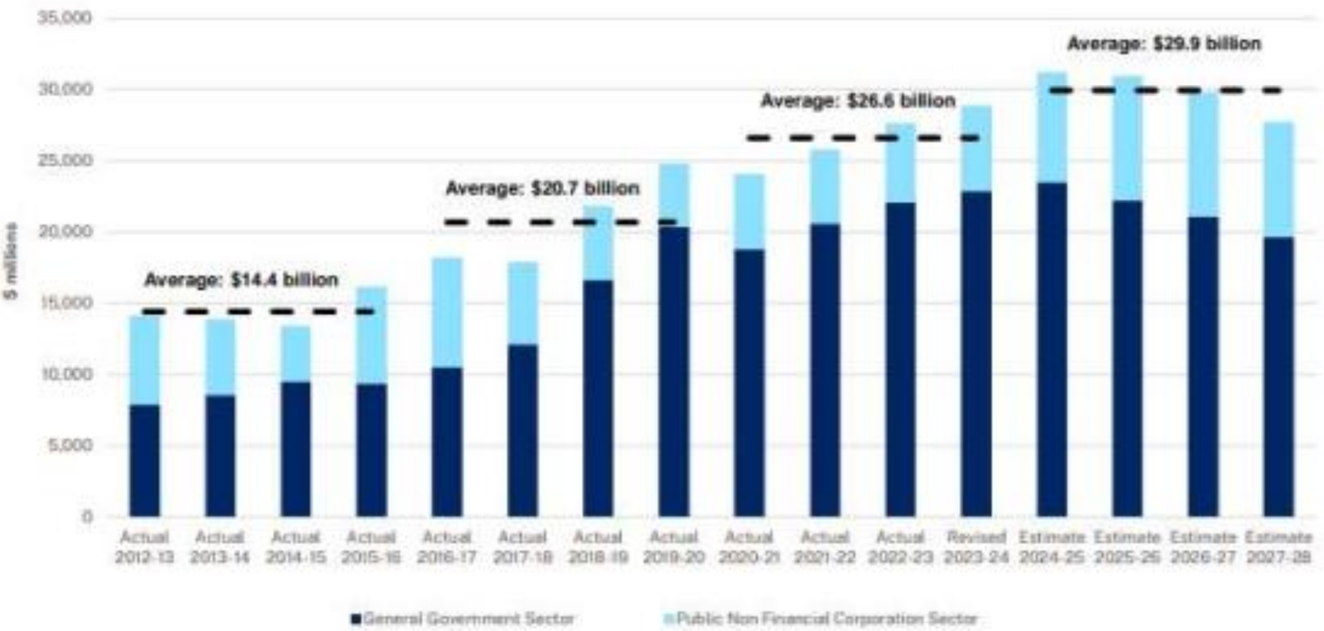
The organisational changes that were presented (e.g. separation of asset owner versus asset delivery) are indicative of a good ability to control/reprioritise in-period.

There are a number of factors that mean program delivery delays could still occur:

- Currently Sydney Water does not monitor outturn-to-estimate scheduling performance, so we were not able to confirm schedule delivery capability across the recent portfolio. We consider it would be very useful for Sydney Water to monitor and continually improve schedule estimation performance, to give greater confidence in the timing of delivery and therefore spend.
- The mix of projects proposed places a greater emphasis on constructing new treatment facilities, in which Sydney Water has less experience, and which are generally more prone to delay than business as usual schemes.

- Data provided in RFI193 also showed that state-wide constraints on infrastructure contracts are likely to continue, as the pressures from the cross-sector program are due to stay high for at least the first half of Period 1 (see below).

Figure 4-73 – NSW infrastructure program



Source: Sydney Water RFI93

This means that some slippage/delay is feasible or even inevitable. However, we have already incorporated extension of delivery timelines for many of the largest schemes in the expenditure ranges provided.

Whilst recognising that it is possible there will be further delays or constraints on delivery we have not applied any further adjustments given the adjustments we have already applied and the project development and supply chain engagement activities already undertaken by Sydney Water.

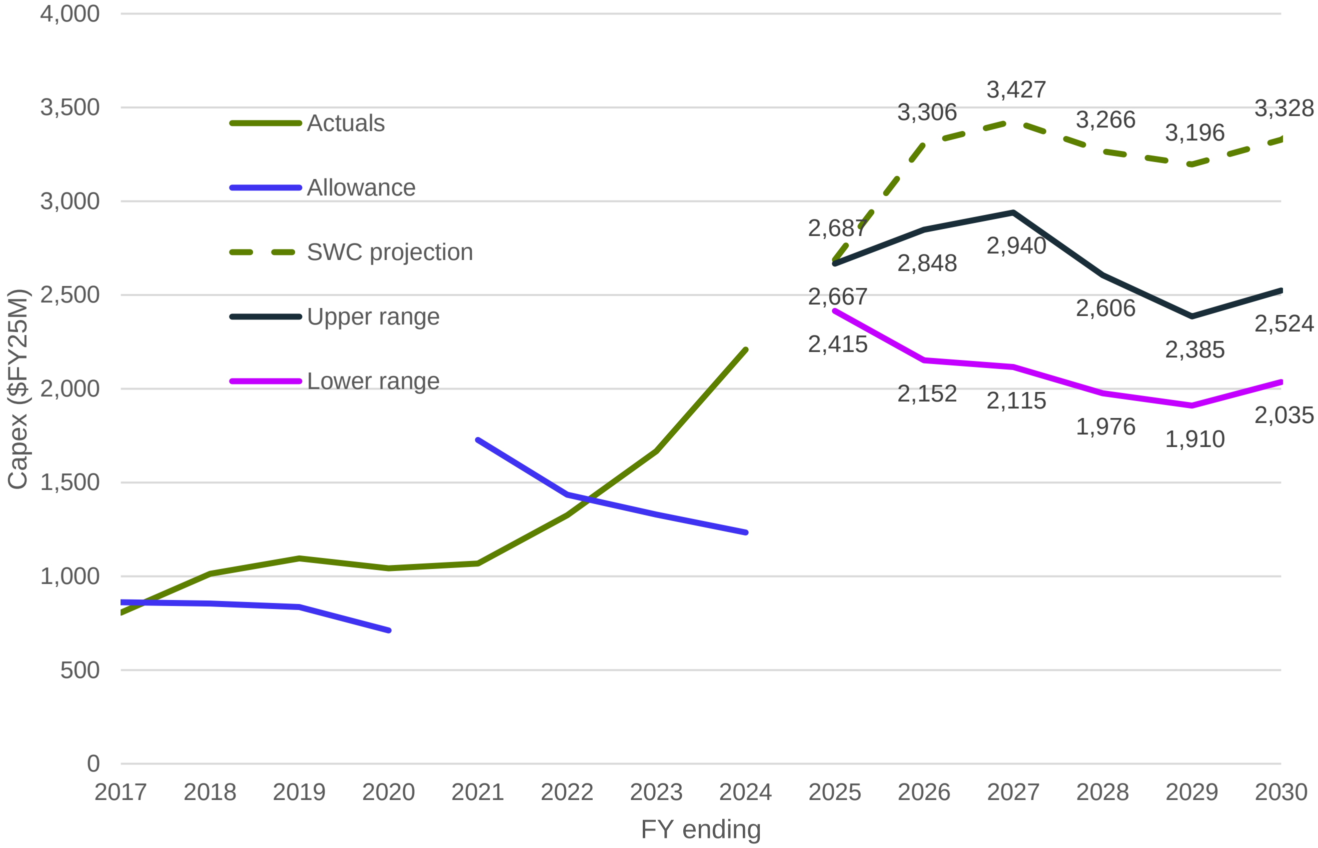
4.10.4 Recommended expenditure

The recommended expenditure based on the adjustments described above is presented in graphical form in Figure below and in table form in Table 4-36 and Appendix B. The upper range represents a total capex of $13,303M (in FY26-30) or 19% below Sydney Water's proposal. The lower range makes a total of $10,189M or 38% lower than the proposal.

These upper and lower ranges are based on the adjustments set out above. We have removed the effects of Sydney Water's own portfolio adjustments on non-growth capex so that these represent our view of the appropriate level of expenditure unaffected by these non-specific adjustments.

It should be noted that the level of expenditure for FY25 is based on our assessment of what may be prudent and efficient to spend but does not take account of project or program level progress in-year.

Figure 4-74 – Total capex expenditure ranges



Source: AtkinsRéalis analysis of AIR/SIR and the 2020 AIR/SIR

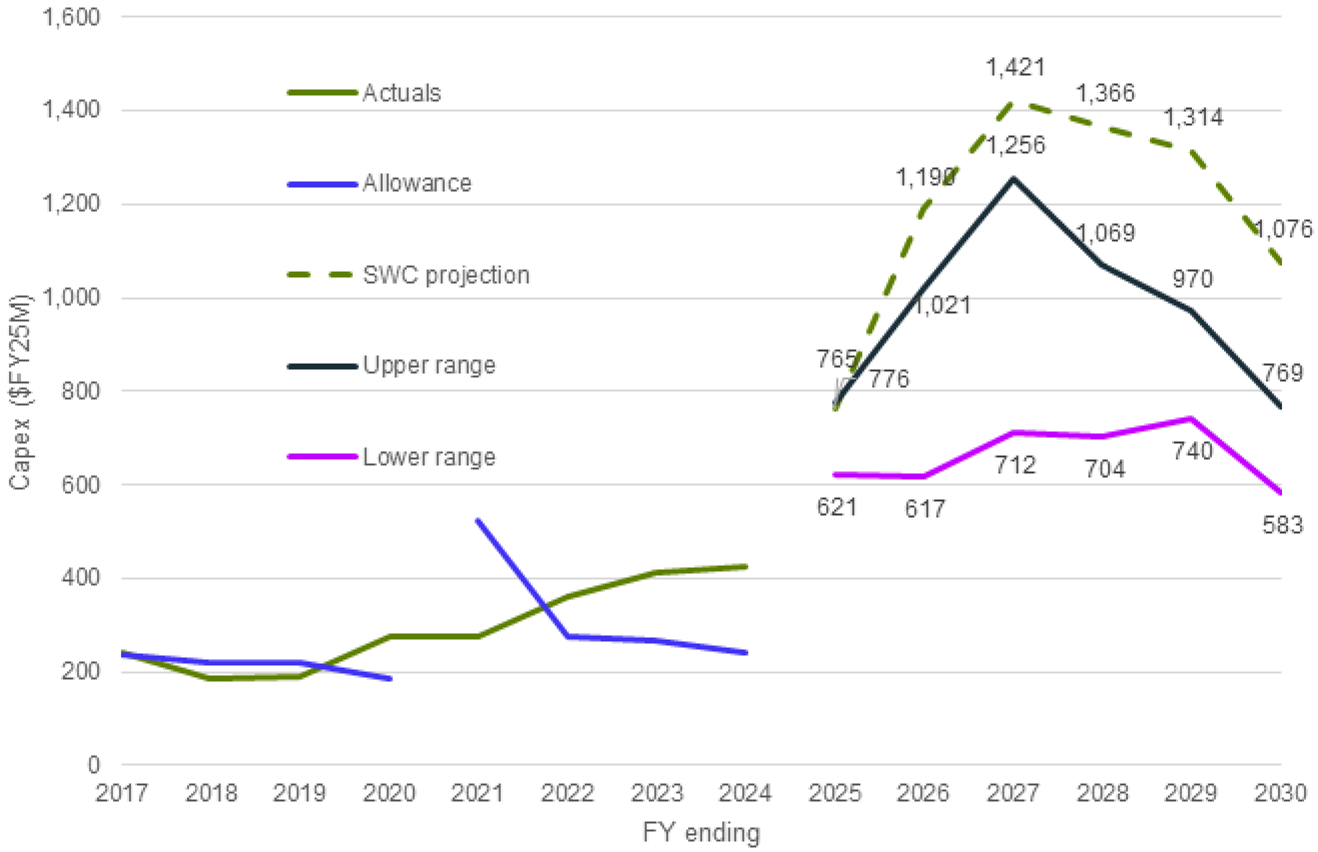
Table 4-36 – Capex ranges by service

Year ending June ($FY25M)	2025	2026	2027	2028	2029	2030	Total 2026 to 2030
Sydney Water Proposal	2,687	3,306	3,427	3,266	3,196	3,328	16,524
Wastewater	1,670	1,832	1,742	1,682	1,650	2,038	8,943
Water	765	1,190	1,421	1,366	1,314	1,076	6,367
Stormwater	47	52	52	51	54	55	266
Corporate	207	233	212	167	177	158	947
Upper range	2,667	2,848	2,940	2,606	2,385	2,524	13,303
Wastewater	1,702	1,579	1,472	1,348	1,216	1,576	7,191
Water	776	1,021	1,256	1,069	970	769	5,085
Stormwater	26	26	26	26	27	26	132
Corporate	163	221	185	164	172	153	896
Lower range	2,415	2,152	2,115	1,976	1,910	2,035	10,189
Wastewater	1,610	1,300	1,206	1,097	986	1,288	5,876
Water	621	617	712	704	740	583	3,356
Stormwater	26	26	26	26	27	26	132
Corporate	157	209	171	149	157	139	825

Source: “SIR Capex2a” and AtkinsRéalis analysis

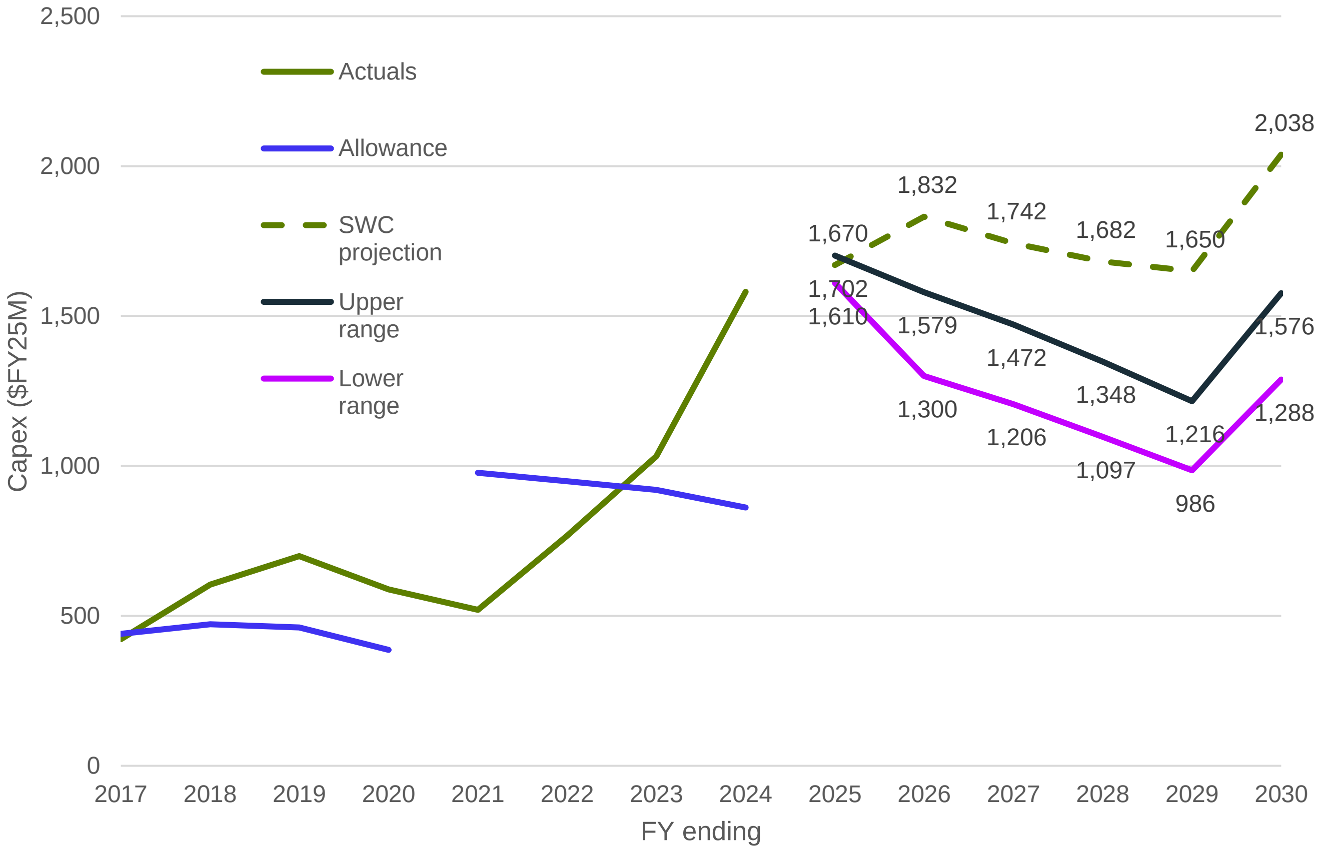
The expenditure range for water shows a larger percentage reduction compared to Sydney Water’s proposal (20% for upper and 47% for lower) than for wastewater (20% for upper and 34% for lower), albeit slightly smaller in expenditure terms. The percentage reduction is largely because of the recommended deferral of schemes such as RRWS. However, the water capex ranges still represent a significant step up compared to recent levels of expenditure as can be seen below.

Figure 4-75 – Water capex expenditure ranges



Source: AtkinsRéalis analysis of AIR/SIR and the 2020 AIR/SIR

Figure 4-76 – Wastewater capex expenditure ranges



Source: AtkinsRéalis analysis of AIR/SIR and the 2020 AIR/SIR

Most of the reduction is in the growth driver, with FY26-30 capex $2,166M (22%) lower than Sydney Water's proposal in the upper range and $3,645M (36%) for the 'lower' range.

4.10.5 Response to the draft report

4.10.5.1 Growth capex

In response to our draft report Sydney Water raised a number of concerns related to the approach taken to assessing growth expenditure. Sydney Water asserted that the SHSF does not account for recent reforms aimed at increasing and accelerating housing supply and that the UGI is a more appropriate basis on which to make investment decisions.

Our view

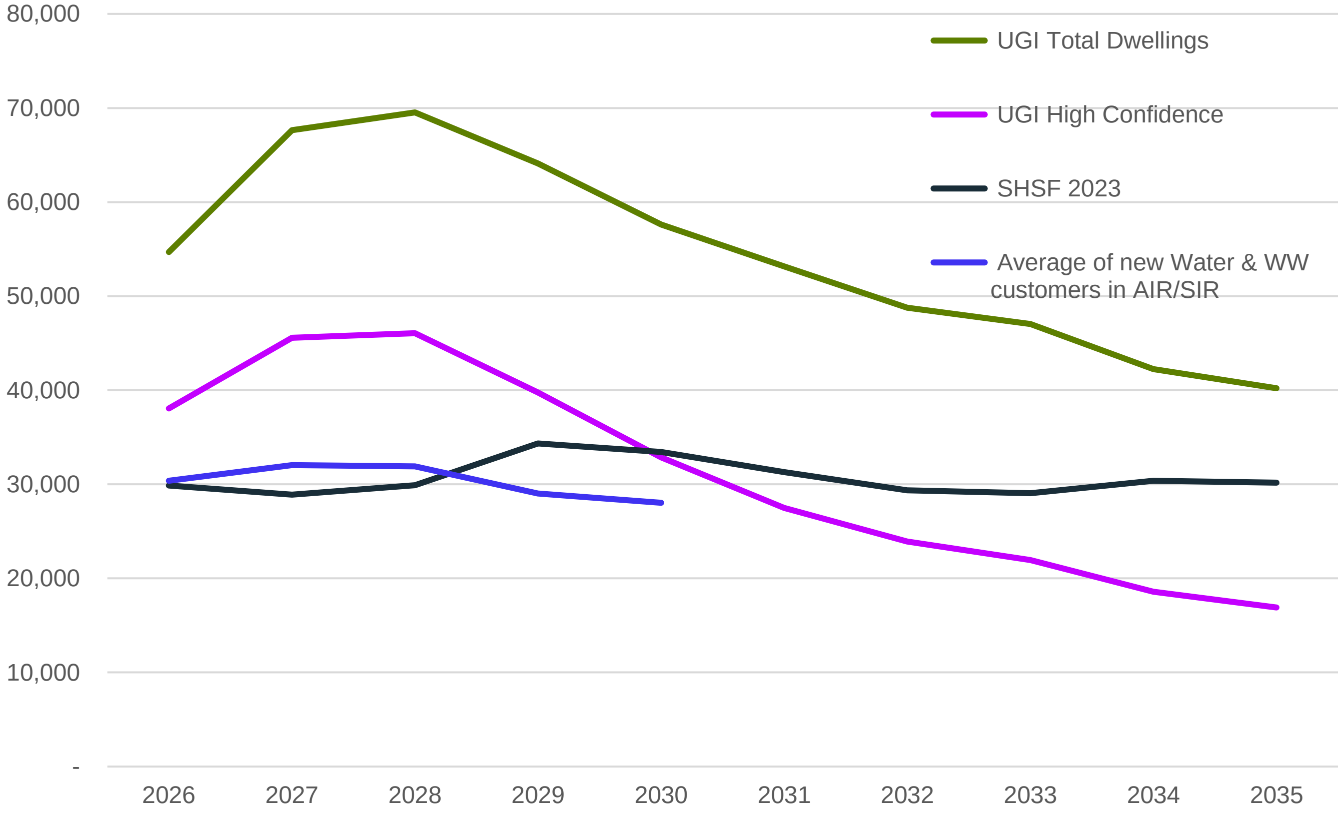
We recognise that there is inevitable uncertainty in the pace and volume of new customers given its link to wider macro- and micro-economic factors and the actions of third parties.

However, we consider that it is useful to ensure that bottom-up local development information is consistent with top down forecasts. Without this, growth planning will be biased towards growth which does not occur at the levels anticipated.

We present below a summary of the different projections provided to us by Sydney Water. This makes it clear that:

- As is often seen with local development-led aggregations, UGI is front loaded when compared to both the SHSF and Sydney Water's new customer projections.
- Sydney Water's own projections of customer numbers, used as the basis of its Pricing Submission, are very similar to the latest version of the SHSF available to the business (SHSF 2023).

Figure 4-77 – Comparison of new dwellings and customer growth data provided by Sydney Water



Source: analysis of RFI167

We acknowledge that the UGI 'High Confidence' layer will tend to represent a more up to date view of developer intentions in areas where growth commitments are more advanced. However, as evidenced by the response to RFI165 on Aerotropolis/Mamre Road stormwater, where the scheme has been delayed primarily due to delays in expected completions, intention does not necessarily match delivery and logically there will be a tendency for developers and councils to be optimistic about the pace of development completions. This is particularly true for those schemes that are in pre Delivery Approval Business Case (DABC) planning stages, with examples such as Wilton Growth Servicing demonstrating the significant reductions in developer expectations that can occur as a project develops.

One key point to bear in mind is that the Business Cases themselves only quantify the scope associated with the 'total' UGI growth forecasts, which are significantly higher than either the 'High Confidence' UGI or SHSF. The costs of the schemes and programs are then adjusted to account for this, but not in a way that quantifies the impact on scope or timing of individual Business Cases. The first stage of adjustment is carried out 'in the round' on each project or program, and we understand from the presentations that this is intended to reduce expenditure to something more in line with the 'High Confidence' growth forecasts in the UGI.

Sydney Water then applies its program-level adjustments, which are intended to represent a higher, but acceptable, level of risk that balances affordability against need. Again, this is not explicit or attached to any quantified change in scope for the growth schemes, but it does imply that there is an expectation that growth is likely to be deferred in comparison to the 'High Confidence' growth forecasts, at least for projects in the pre DABC stage of planning.

Our analysis has effectively taken this approach but tried to quantify the scope impact of following the SHSF instead of the High confidence Growth which we were informed is reflected (in the round) by the adjusted Business Case forecasts.

Finally, we note that the 'bottom up' assessment that uses individual Business Cases and applies the SHSF assumption is only part of our analysis and generates the higher end of the plausible range that could have been used for the upper growth scenario. Our 'top down' analysis is based on the understanding that schemes that are at the DABC or later stages of development are likely to be based on more robust forecasts. We have shown that expenditure will typically lead need by 2-3 years, which indicates that the expenditure rate at the start of the period is sufficient to meet growth needs associated with the peak growth rates that occur in years 3 to 4 of the period. There is no clear reason why expenditure increases beyond the rates in the early part of the period. This 'top down' analysis generates cost reductions that are around 25% more than the 'bottom up' assessment. Given the reputational and social risks associated with constraints on development we have used the more generous, 'bottom up' assessment, but the 'top down' assessment provides evidence that the approach we have taken is reasonable.

Our conclusion is that:

- There is clear uncertainty in the levels of future growth.
- It is important to take a top down view to ensure that bottom up projections make sense when aggregated.
- The UGI projections which Sydney Water proposes should be used as the basis of growth capex are significantly higher than the SHSF and Sydney Water's own projections of new customers used in its pricing model. The 'run rate' of expenditure from the better developed projects at the DABC or later stages of planning also suggests that growth allowances are higher than those Sydney Water has derived from the adjustments it has applied to the UGI based Business Cases, when examined on an aggregated basis. We are therefore not persuaded that UGI data provides a better basis for aggregated growth planning in the 2025-30 period.

4.10.5.2 Renewals capex

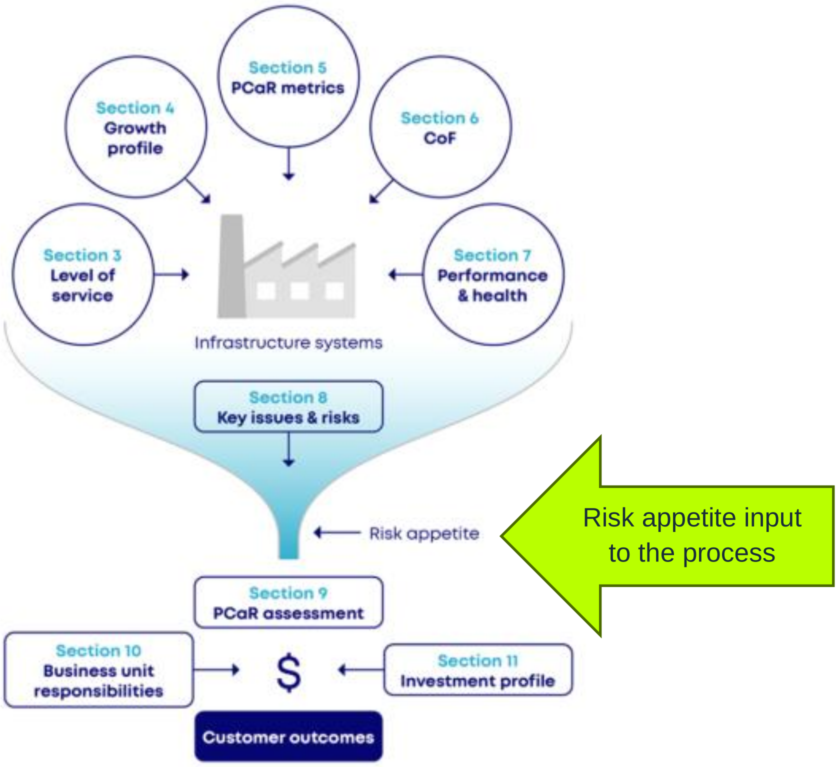
Sydney Water also raised a number of concerns related to the approach taken to assessing renewals expenditure, asserting that it is not proposing a material change in the level of risk, that we placed primary reliance on lag indicators in our review and that it is not correct to claim it does not apply a clear and consistent decision-making framework as it uses the Infrastructure Decision Tree for this purpose.

Our view

We asked for, reviewed and commented on forward-looking projections whenever these were available to us and many of these are included within this report. We can confirm that we have not placed primary reliance on lag indicators where projections have been provided to us. However, projections are not meaningful without the context of historical performance and risk, and as such we consider it entirely reasonable to also comment on the historical data provided.

At interview we asked how the level of risk had been selected for each asset class. The responses and documents provided laid out no clear rationale for the levels of risk and pace of improvement selected. We note that, as can be seen below, risk appetite is an input to the Infrastructure Decision Tree rather than an output from it.

Figure 4-78 – Sydney Water's Infrastructure Decision Tree



Source: Sydney Water presentation 2E.

Our conclusion remains that the references we have made to historical data as well as projections are appropriate and that the Infrastructure Decision Tree does not in itself constitute a clear rationale as the key variable setting the level of expenditure, risk appetite, is an input to this process and varies between asset classes.

5. Digital expenditure

5.1 Summary of findings

This chapter presents a review of Sydney Water's proposed digital expenditure.

Sydney Water's total digital expenditure encompasses both Information Technology which underpins the running of the whole organisation as well as Operational Technology which supports the monitoring and control of its assets. The business is a digitally mature organisation nowadays. It is completely unrecognisable from the early reviews we undertook in 2011 and 2015, and there is also an uplift in capability evident since the last review in 2019. The key evidence that can be sighted to support these findings include:

- Effective cost estimation on the whole for capex, less visibility for opex costs;
- Procurement approaches which promote best value;
- Clear focus on identifying and then demonstrating delivery of efficiencies;
- Avoidance of customisation of new systems wherever possible which could otherwise add considerable risk and by extension cost to projects.
- Successful implementation of major projects, most notably BxP;
- Evidence of working within a constrained budget for project capex and opex.

Overall, Sydney Water has demonstrated successful delivery of key initiatives in current price period, even if the actual program is substantially different from that originally proposed as it responded to changes in its operating environment and changes in priorities. We concluded that expenditure appears to be generally prudent and efficient and therefore if historical performance can be used as an indicator, then this is a positive sign for its assessment of future needs. We did however note in terms of deliverability of the program that actual end dates slip significantly in a reasonable proportion of cases.

Sydney Water is generally able to demonstrate a clear link between performance, investment and where applicable efficiencies, both for Information Technology and also for Operational Technology investments. For the future price path, there is evidence of prioritisation and significant cuts taken to capital program as a result of top down decision from executive management. The key drivers of expenditure, including step changes in opex, are:

- Significant increase in Cyber and Data Centre requirements have and will continue to impact Sydney Water as a result of new legislation and requirements of NSW Government – in line with the picture we have seen elsewhere in Australia and globally – and is unavoidable. The Company's approach to meeting these challenges appears reasonable and efficient.
- Digital expenditure continues to shift from on premise capex solutions to software and platforms as a service, which results in the balance of total expenditure shifting from capex to opex, a trend which had already started at the time of the last review and will continue.
- Enterprise Asset Management investment drives step change increase in Systems of Record expenditure in the next price path – and aligns with plans presented at the last price review as the system will be unsupported from 2028.

While benchmarking has limitations, which we set below, both Sydney Water's insight which it commissioned and our own review of digital spend as a % of total expenditure, demonstrates that the rate of the business' proposed digital totex is lower than in the current price path and, depending which analysis is looked at, it is either in line or at the top end of the scale when benchmarked against others.

In line with IPART's request, we have identified both an upper and lower range of capex and opex investment which draws on our findings from review of its plans as well as its proposed rate of digital spend. At the upper end, no change is proposed for digital capex and for digital opex the adjustment takes account of some double counting we have identified. Adjustments are proposed for the lower end for both capex and opex which maintain the same level of overall digital investment to align with any reduction in the overall total expenditure. We have set out the potential risks associated with the different scenarios.

5.2 Background and digital strategy

5.2.1 Roadmap and key programs

Sydney Water's digital strategy is set out in its Digitalisation Roadmap which identifies clearly and in a structured way its goal and its approach to become an "Intelligent Water Utility" through the implementation of specific digital solutions, and for the benefit of customers and the environment. It considers emerging technologies, including disruptive technologies, alongside external challenges in the operating environment (growth, climate change, customer expectations, unpredictable events and Government requirements) and its business needs. This is underpinned by a set of seven guiding principles[67] which we concur should promote prudency and efficiency if and where they are followed. The roadmap considers the current state and what is required to enhance capability, which in turn translates into a longer-term 10-year Program Investment Plan from 2025 to 2035. This creates a line of sight directly into Sydney Water's expenditure requirements for 2025 to 2030. It should also be noted that a higher level of absolute digital expenditure is being forecast for the 2030 to 2035 period.

Major initiatives continue to align against four key programs from the 2020 to 2025 period, which is helpful in both providing continuity with the past and future needs and priorities, as well as understanding the key drivers for expenditure. These are:

- **Foundation and Connectivity Systems** – Foundation systems are the cornerstone of technology services and underpin the critical day-to-day operations. They include foundational infrastructure technologies such as end-user devices, services and networks and enterprise services, which enable connectivity, security and collaboration. Cyber security uplifts fall under this program.
- **Systems of Differentiation** – Systems and associated services support business capabilities that deliver on better life strategy and enable data-driven decisions. Key areas include spatial, digital twins, modelling and field mobility resource management tools that enable the delivery of reactive and planned work orders, linked to optimal asset management. It also includes the digital customer platform to enable improved interactions with customers for example through self-service and interactive digital experiences.
- **Systems of Monitoring and Control** – This focuses on implementing new tools and increasing automation to improve service reliability and reduce costs. Sydney Water describes this as the "interface between the digital and the physical world, allowing us to automatically operate physical infrastructure in a safe and reliable way". It includes both traditional telemetry and SCADA systems and applications for operations resource management as well as operational technologies like IoT that allow real-time asset monitoring and analytics for more

[67] The guiding principles are: 1. Reusable Capability - Leverage existing platforms and partnerships first – before buy, before build. 2. Adaptable Platforms - Enterprise design thinking will be applied to all digital platforms making them flexible, agile and modular. 3. Digital by Default - Digital tools and data will be considered key to unlocking productivity gains across all that Sydney Water does. 4. Value Proposition - Invest in technologies only where there is a need and value to the benefit of customers. 5. Pervasive Data Build with Data in mind - Data is interconnected and valued by Sydney Water's people. 6. Anytime, Anywhere, Anyone - Digital services will be location and time agnostic and allow customers, people and partners to frictionlessly interact with Sydney Water anytime anywhere. 7. Ambitious & Innovative - Be prepared for and embrace technology disruptors and ready for innovation.

efficiently managing our physical infrastructure and will enable new approaches to demand management and pricing.

- **Systems of Record** – These are the systems and associated services that support the common business capabilities such as finance, human capital management, payroll, procurement; customer management and Enterprise Asset Management that underpin the operations of a business. Sydney Water continues to consolidate these business capabilities into a unified architecture, adopting standard processes. The replacement of now or soon to be obsolete systems and the move to simplify and consolidate the overly complex digital landscape was reflected in activity in the previous two price periods proposals and continues into the next. It accounts for the biggest area of investment, across the Business Experience Platform (BxP), which is Sydney Water's SAP ERP system, the People Experience Platform (PxP) for human resources, the Customer Experience Platform (CxP), another SAP service, and transformation of the Enterprise Asset Management (EAM) platform.

5.2.2 Totex analysis

The consideration of capex digital expenditure in isolation of opex expenditure would negatively impact on the robustness of any analysis in our opinion. It is essential to consider the total cost of ownership as there is often either or both project opex (propex) associated with digital capital projects and significant recurrent opex costs associated, in particular, with annual licence costs, regular patches, upgrades and security controls for software. In addition, the market has been transitioning over approximately the last five years from on premise capex solutions to cloud-based software and platforms as a service, shifting away from capex to opex. Sydney Water recognises these changes and addressed them reasonably well in the way that it prepared its submission and its approach to presenting plans to us, particularly for the capex and propex components, although more visibility could have been provided for the other digital operational expenditure which we have found more challenging to unpick.

There is the suggestion from Sydney Water that the customer impact of this shift is minimal:

> *Notably, digital assets have a relatively short depreciation life – typically five years for physical hardware and 10 years for software – meaning the impact to customer bills of using capex or opex is minimal. On-premise hardware and software are generally treated as an asset and depreciated, while cloud services are subscription based, so they are treated as opex. Overall, the impact is marginal and, with new efficiency schemes, will incentivise the best total expenditure solution for our customers[68].*

We are less convinced. Firstly, while most digital assets do have relatively short depreciation lives, the large on premise capex investments would have a longer asset life typically of 15 to 20 years so the switch to opex can impact more directly on bills in these cases. Also, it is very debatable what the overall effect on expenditure levels is of this trend. There are three scenarios, that this could have no net effect on total expenditure, that this could potentially create a benefit by leading to a reduction in overall digital costs compared with the on premise solution, or that it is leading to an increase in total costs. We are not aware of any research, and perhaps it is too early to draw any firm conclusions given that this shift is still relatively new. However, our impression from anecdotal evidence is that the subscription model gives digital suppliers more power and therefore opportunities to increase licence costs as the suppliers have a captive audience once their solution has been selected. It also leads to an increase in cloud costs. This is not therefore good news for "customers" such as Sydney Water and we believe it explains some of the step changes in digital opex costs that are being seen.

We also note that significant investment has been made in the BxP on-premise SAP solution but Sydney Water has stated that SAP has announced a shift away from on-premise to cloud based services, with an end of life forecast for 2029/30. There is transitional investment required and it is possible or even likely that there will be remaining

[68] Sydney Water Pricing Proposal, Chapter 4 Operational Expenditure

asset life in the on-premise BxP platform that will be replaced in the next price path. This means customers could be paying twice for the same service, or to be more accurate, a proportion of the costs. The original business case for BxP was made back in 2016, at which point we think it would not have been possible to foresee the changes in the market. We are flagging this up for consideration at the time of the next review.

5.2.3 Current period

Sydney Water has highlighted that it spent -22.9% under the IPART determination for 2020-24 period for the project capex and opex element of its digital expenditure ($606.2M determination against $467.6M actual). This does not take account of the other digital opex and also because FY25 was not part of IPART's 2020 Determination, the analysis does not include the additional year. Sydney Water is forecasting expenditure of digital project expenditure of $122M, a 2.7% real term reduction in total controllable expenditure compared with FY24, or a 4.4 % increase if the average of the previous four years is considered. Therefore, if we assume that FY25 has the same determination value as FY24, the combined variance of the period FY21 to FY25 would 17.2%, or if the average determination value over the first four years is used, the variance is -22.2%. The message is still one of underspend, with the proportion unchanged. However, as identified above, the analysis is different when core opex and propex are considered: there is a significant increase in opex in FY25 compared with both the previous year and the average over the previous four years[69].

The nature of digital spend compared with other areas associated with Water, Wastewater and Stormwater, is that there is also considerable volatility in the type of investments. So a key takeaway from the current period is not only an underspend but also that the projects taken forward were in some cases very different from that originally forecast. Notable differences include:

- **End User Technologies** – Overspend driven by shift towards remote work triggered by the pandemic with the need to replace desktop computers with laptops (33% increase on IPART determination).
- **Cyber Security** – Uplift to meet Operating Environment obligations and to maintain critical infrastructure security in harmonisation with partners (196% increase to $16.6M in IPART determination period).
- **Digital Centre Migration** – Due to SOCI Act and resulting change in Department of Customer Services policy led to new strategy which led to a completely different solution (71% decrease from $60.6M in allowance for project capex and opex, although new solution led to an increase in other digital opex as a result).
- **Modelling** – Strategic decision taken to temporarily halt any investment to focus on other areas and rely on enhancing models through BAU processes ($19M not spent).
- **Hydraulic System Services** – Significant underspend due to pandemic-related site access and supply chain issues and reprioritising Internet of Things deployment instead (35% decrease to $86.9M).
- **Enterprise Asset Management** – Strategic decision taken to focus investment on Field Mobility platform as was novated and made end of life by new acquirer and creating a risk to a business-critical system. EAM expenditure deferred and replaced with program of smaller short-term EAM enhancements ($41.7M not spend in IPART determination period).

The drivers and requirements for expenditure originally proposed but not incurred in the IPART determination period between FY21 to FY24 have not in general disappeared. We understand therefore that much if not all of this expenditure is either forecast to be spent as part of the $168.7M in FY25 or as part of the proposed expenditure in the next price period.

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[69] Opex adjusted when propex added equals $491M over FY21 to FR24, or an average of $122.8M per year over four years. Opex adjusted when propex is added for FY25 is $162.5M, which is a 32% increased compared with average of previous four years or 21% increase on FY24.

5.2.4 Success measures

Alongside scrutinising the outputs of Sydney Water's digital investment, we also look at the link between digital expenditure and the delivery of successful outcomes. Digital is an important enabler for efficiencies, so we consider the efficiencies and potential other benefits realised through digital initiatives. This is covered in the next section.

We also think the robustness of cost estimation is an important measure of success. We asked Sydney Water to provide a summary of its high value investments completed in the current price path to understand the budget variances. The six projects had a P90 original cost estimation of $158.8M and outturned at $160.3M, a difference of 0.9%[70]. Overall, the picture is a positive one with relatively little variation.

Table 5-1 – Analysis of variations from original estimate to outturn costs for major digital projects completed in current price path

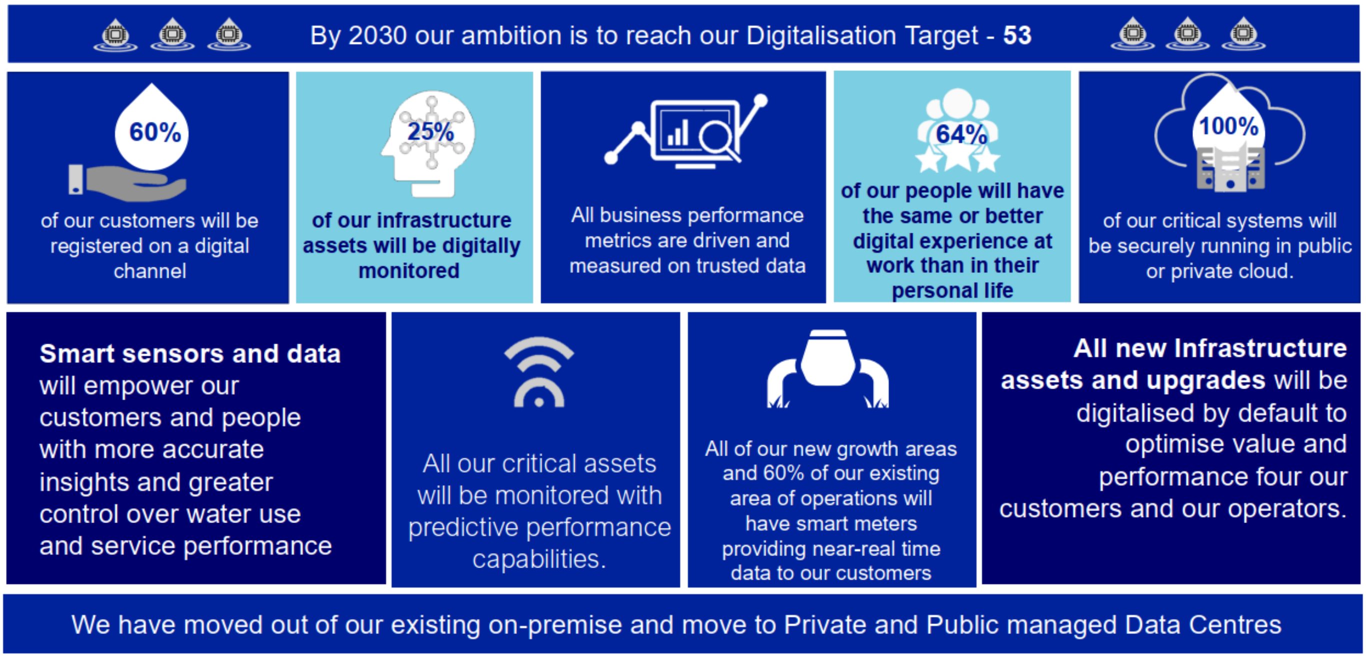
Project	Budget variation ($M)	Difference (%)
BxP	1.4	1.6%
BxP Optimisation	-0.2	-1.6%
Digital Customer Platform	-0.2	-0.8%
Data & Analytics Foundation	-0.0	-0.2%
Wingara	0.2	2.1%
Corporate Banking Migration	0.4	4.4%
Total	**1.4**	**0.9%**

Source: Adapted from RFI 86 response. Note: numbers may not sum due to rounding

In addition, Sydney Water has also created a Digitalisation Index, what it refers to as its strategic success measure to track, measure and assess the aspirations and impact of the Digitalisation Roadmap. A baseline score of 28.3 has been set with a target of 53 to be achieved by 2030. Overall, we think it is a valuable additional tool, which articulates in a global way how investments will make a difference by setting targets and goals which provide a link to the elements of the programs described above. The limitations are that it is difficult for us to assess how stretching the targets are, the metric is not evidence in itself that investments are being made in a prudent and efficient way and also it is bespoke to Sydney Water rather than allowing for comparison with its peers.

[70] We removed End User Technology from the dataset that Sydney Water provided to us in our analysis. While there was a significant reduction for End User Technology (-$5.2M, -28%) against the original business case, we have noted elsewhere in this report that End User Technology at a category level (grouping of projects as opposed to business case level) had an overspend of $4.6M. We understand the differences between the scope of the two values but we think that there is sufficient crossover to exclude it from our analysis.

Figure 5-1 – Sydney Water's Digitalisation Index



Source: Sydney Water Digitalisation Investment presentation, 19th November 2024

Through our review of the major projects that have been delivered, we have seen other supporting evidence of successful implementation which is in addition to efficiencies being delivered. For example, we have looked at the evidence from deep dive reviews of BxP which highlighted:

> *Sydney Water has demonstrated over the course of the BxP Program an outstanding high-level of program delivery capability. There is no doubt that this delivery approach and the successful outcome it achieved provides the benchmark and model for other organisations to note. The Sydney Water Board, the Executive and the BxP Program should be congratulated for this significant achievement.* Department for Customer Service Gate 6 Post-Implementation Report (March 2022)
>
> *We would like to commend the efforts of all the teams involved in delivering the BxP program successfully despite the challenges faced due to the Covid-19 pandemic. As a recognition of this success, SAP has awarded the BxP program the SAP Best Run Intelligent ERP award for 2021. A huge congratulations to all parties involved, it is well deserved.* PwC Business Experience Program (BxP) Post Implementation Review (March 2022)

5.3 Proposed expenditure

Sydney Water is proposing an overall 19% increase in digital expenditure in the next period, driven by a significant increase in operational expenditure (39%), as opposed to capex investment which is a reduction (-5%) compared with the current period.

Table 5-2 - Digital expenditure in current and next periods ($FY25M)

	Current period actuals and FY25 forecast	Next period proposed	Variance next period proposed versus current	
Opex incl. Propex	$653.5	$910.2	$256.7	39%
Capex	$ 566.8	$537.9	$-28.9	-5%
TOTAL	**$ 1,220.3**	**$1,448.1**	**$227.8**	**19%**
Average over 5 years	*$244.1*	*$289.6*	*$45.6*	

Source: Sydney Water Proposal with Capex and Opex adjusted for propex analysis in RFI 92

The key drivers of expenditure, including step changes in opex, are:

- Significant increase in Cyber and Data Centre requirements have and will continue to impact Sydney Water as a result of new legislation and requirements of NSW Government – in line with picture we have seen elsewhere in Australia and globally – and is unavoidable. The Company's approach to meeting these challenges appears reasonable and efficient.
- Digital expenditure continues to shift from on premise capex solutions to software and platforms as a service, which results the balance of total expenditure shifting from capex to opex, a trend which had already started at the time of the last review and will continue. This includes expenditure associated with the CBxP Roadmap which will require transition for SAP services from on-premise focus to cloud services and also links to the decommissioning of the GovDC hosting environment.
- Enterprise Asset Management investment drives step change increase in Systems of Record expenditure in next price path – and aligns with plans presented at the last price review as the system will be unsupported from 2028.

The key investments associated with the proposed $538M capex and $52M propex are:

- Foundation and Connectivity Systems – Essential Core Maintenance $74M, End User Technology and Core Services $56.6M, Cyber Security Uplift $34M;
- Systems of Differentiation – Product Continual Development $54M, Application Projects $33M, Modelling $24M;
- Systems of Monitoring and Control – SCADA $63M, Smart Sensors new, replacements and platform $35.5M;
- Systems of Record – Enterprise Asset Management $100M, Product Continual Improvement $56M, CBxP Resilience $49.7M.

There is evidence of internal challenge with prioritisation of the original portfolio to identify a constrained budget to which Sydney Water then applied a 7.7% stretch efficiency applied to. As this is a 'top down' adjustment, it is not possible to determine the effective reduction that has been applied to individual projects.

As discussed above, there are various drivers why digital operational expenditure is increasing, both in its own right and also in line with reductions in capital spend. The key elements of the other $858M digital operational expenditure are made up of a mixture of base opex and step changes:

Table 5-3 – Key elements of digital operational expenditure

Opex items	Total opex including step change	Element identified as step change
Labour	$261M	$0M
Managed services	$181M	$77M
Software licencing and maintenance	$144M	$35M
Cloud subscriptions	$105M	$45M
SCADA and Ops Control	$60M	$24M
Professional services	$40M	$2.5M

Source: Digitalisation - Technology Opex 22 November 2024 Presentation and RFI 279

5.3.1 Procurement

We reviewed the approaches and associated governance used for procuring digital solutions including hardware, software and services. This varies depending on both requirements and value, and could be sourced for example by the Digital Partner Panel that has been set up, by direct approaches to specialist suppliers where more appropriate and through the NSW Whole of Government contracts where this offers best value.

A minimum of three vendors is required, and extra assurance will be put in place where, by exception, this is not received. Considerable time is spent on agreeing the core terms and then working on the details of the scope. Depending on the asymmetry of expertise and information, Sydney Water may choose the product and reach out to vendors, or alternatively vendors will be selected to propose the most viable product.

Overall, we were satisfied that the approaches to procurement reflect good practices and should promote securing efficient costs.

5.3.2 Efficiencies

There is a clear focus on identifying efficiencies through digital investments. Sydney Water's business cases link between performance, investment and where applicable efficiencies, both for Information Technology and also for Operational Technology investments. There is more robustness compared with the past around tracking whether efficiencies and other benefits are subsequently delivered which provides more confidence in assessing efficiencies proposed in future plans.

The proposed step efficiencies linked to digital is made up of efficiencies from the 'approved' programs which have been implemented through or during part of the current period; for example, the digital customer platform and the PxP program. The 'Flow' program is the largest efficiency driver from the 'approved' programs and was commissioned in the current period. This derives efficiencies from automation of the scheduling and despatch activities including reduced travel time and an increase in first time fixes. These automated processes also bring more effective resource planning and preventive maintenance planning.

Table 5-4 - Proposed digital step efficiencies by program

Year ending $FY25M	Total 2026 to 2030
Digital customer platform	$3.4M
Flow program	$52.6M
Optimise digital infrastructure	$9.7M
People Experience Platform (PxP)	$3.9M
Subtotal approved programs	**$69.6M**

Source: Presentation 5F

We also identified that the value of efficiencies linked to the Smart metering do not align with the latest estimates which are 13.9M, not $8.8M. This is made up of $9.8M for cost reduction for metering contracts, $3.7M for cost avoidance of meter reading and $0.4M cost reduction for Customer Services. We have adjusted the values using the same proportional allocation.

Table 5-5 - Step efficiency adjustment for Smart metering

Year ending $FY25M	2025	2026	2027	2028	2029	2030	Total 2026 to 2030
Smart metering		0.8	1.3	1.8	2.2	2.7	8.8
Smart metering adjustment		1.3	2.1	2.8	3.5	4.3	13.9

Source: Presentation 5F and RFI 162

We also asked for more visibility on the benefits delivered through the Operational Technology (OT) investments. This derives from a mixture of investments already made as well as some that will continue into the future price path.

Table 5-6 – Operational Technology benefits

OT investment	Benefits including quantifiable efficiencies
Capability of monitoring and control	Reliability and customer confidence, reduced maintenance and operational costs; better product quality; less incidents. Engineering efficiencies; better quality of systems and products. Reduced time and safety risk for field hydrographers. Achieved and ongoing via BAU OPEX systems. Maintaining our data uptimes to operational efficiency level targets (e.g. SCADA = 99.97% uptime).
OT renewal	Business continuity, compliance, risk mitigation. New devices provide better security and functionality.
Custodians of standards	Consistency, scalability and maintainability of assets ongoing. Mitigation of risks leading to incidence reduction Achieved & ongoing.
Plant automation	Reduced labour and materials cost, improved reliability and efficiency.
Single-pane-of-glass	Adequate, real-time reporting, improved operational decision making, operational awareness.
Digital Twin	More efficient project execution and asset data handover. Improve lifecycle and operational performance with informed insights. Broader business value and insight for external partners. Provision of 3D data for BIM/Digital Twin - reduce time/cost for capital projects design Future cost savings: projected $900k from initial stage (BIM) FY27, rising to $6.4M from second stage FY30 based on current delivery plan and planned use cases towards asset management efficiencies (Total $9.4M projected savings across price period FY26-30).
Data access	Greater insight and use of data (with reduced manual analysis) to increase efficiencies and reduce costs; Enabler for proactive operations; Better analytics and broader use of the data, improved plant optimisation; Enable IICATs network users to access hydrometric data for visibility, troubleshooting & optimisation. Reduced costs and effort to integrate devices with control systems. Achieved and ongoing.
Data and insights	Enable predictive maintenance and operations. Enabler for extended HUB/SOC operations. Reduced sewer overflow and environmental events, reduced customer complaints and costs to clean up. Improved hydraulic model accuracy to enhance licence compliance. Reduced leaks, water usage insight, improved customer awareness. More data insight and control of operations assets, operations performance enhancement and cost savings. More insight into energy usage and control of use. Achieved and ongoing.

Source: Digital presentation and additional supporting information provided in RFI 89

Efficiencies formally identified by Sydney Water through named programs are delivered by projects completed or largely completed in the current price path. Some of the future investments are at an early stage of development so the exact details including quantification of efficiencies is not yet available. While this is not atypical for digital investments, there is a notable lack of efficiencies being proposed for new projects being delivered in the future price path. For OT investments, the Digital Twin has quantified benefits of $9.4M projected savings over FY26-30 and for Enterprise Service Management investment we have visibility of $23M in benefits identified across 10 years). Other digital projects in planning which will contribute efficiencies are:

- Spatial: Mobility, partner interoperability, and developer interactions;
- Modelling: Forecasting, energy optimisation, planning and financial management;

- Enterprise Asset Management (EAM): Asset planning, delivery and operations, product risk mitigation, field and inventory optimisation, although this will not be completed until near the end of the price path.

It is our understanding that these are captured within the general pot referred to as *Continual improvement (operations, procurement and contracting)*, with a commitment to deliver $257M of efficiencies.

5.3.3 Benchmarking

Benchmarking digital expenditure allows for drawing out useful comparators for analysis, although there are some limitations[71] which means it can be somewhat of a blunt instrument. This means that any insights should be used as an additional tool to support analysis and decisions about efficiency when considered alongside other Sydney Water specific evidence.

Sydney Water commissioned benchmarking and also quotes other research which it states demonstrates either that its digital spend is broadly within industry norms or in some cases would be considered at the lower end of the spectrum. We have made some observations on the analysis and also include our own analysis below. There is also some benchmarking done at project level and we have included reference to the EAM investment.

Table 5-7 - Proposed digital step efficiencies by program

Area	Analysis from consultants	Source	Our observations
Capex benchmarking	Australian water companies are generally in the range of 6% to 10% of Capex. Overall, Sydney Water has historically spent comparatively on par with peers. Spending has also been in line with the observed wider water and electricity utility industries. Sydney Water's PR25 budget [for 2026 to 2030] represents a relative IT spend of 8.6% [once growth is discounted].	1	We would argue that totex benchmarking is more useful given the shift in expenditure as this only gives a partial picture. We are also not convinced by all the conclusions drawn. Firstly, Sydney Water was a considerable outlier back in 2016-20 (12.9%) and there appear to be only two water companies with a higher capex rate (>8.6%) for the next price period, although it is unclear if that's actuals or future forecasts for the other utilities. Another unknown is whether the benchmarks for other utilities include both IT and OT, which it does for Sydney Water.

[71] Limitations include: (1) Some qualitatively different characteristics within Australia between urban water utilities compared with bulk water suppliers, and when comparing overseas they may have serve populations with very different geographic and climatic operating environments; (2) Some water utilities include Operational Technology spend alongside their Information Technology budgets which would mean they are significantly larger, as is the case with Sydney Water, while in other utilities these costs sit within projects; (3) There are sometimes limited opportunities for economies of scale with digital expenditure so relatively small organisations have to spend a larger proportion of their total expenditure to address the same needs or requirements; and (4) Businesses may be at different points in their investment cycles and/or level of digital maturity.

Area	Analysis from consultants	Source	Our observations
IT spend as a % of revenue	Sydney Water 6.6% versus average of 5.4% and 3rd quartile[72] of 6.6%.		The research uses data from 10 US companies and 2 international comparators, the majority of whom have water as a core part of their business; some also supply gas/electricity. It is difficult to know if they are representative comparators although the benchmark values do not look out of place.
IT Opex spend as % of revenue	Sydney Water 3.8% versus average of 3.6% and 3rd quartile of 4.3%.		
Capex and opex split of IT spend	Sydney Water capex 43% and opex 57% compared with average of capex 33% capex and opex 67%.		
Year on year change in IT spend	Sydney Water states: *"This is a highly conservative approach to investment as benchmarking shows the industry is increasing digitalisation investment of between 8.8%p.a (Bluefin research) and 16%p.a (Infotech Benchmarking)".*	2	Sydney Water quotes 16% pa in its documentation but the report is more nuanced: industry average is 6% increase in current year and 11% increase in upcoming year, 3rd quartile is 11% and 16.5% respectively. The highest value appear to have been used and we do not think looking at increases over a three year period are meaningful.
		3	We do not have sight on how this value has been derived.
Enterprise Asset Management (EAM)	Despite Sydney Water's current estimate of $75 million for EAM implementation being $9.5million more than the most expensive modelled cost, it is suggested the current estimate is retained. Due to the size, scale, complexity, duration and importance of the initiative to the organisation, holding a c.13% contingency is a prudent decision.	1	We are not sure of the source of the $75M value used by the consultants. Sydney Water has allocated $100M for EAM implementation in the future price path.

Sources:

1. *Digital Transformation Investment Due Diligence (May 2024)*
2. *IT Spend and Staffing Benchmarking Report (April 2024)*
3. *Bluefin research – but we do not have sight of original report.*

We include below our analysis of Sydney Water's expenditure and also the benchmarking analysis that we have access to for comparison:

- Sydney Water's digital spend is forecast to be 7% of total expenditure for the current price path, this is in fact lower than the 7.7% based on the capex and opex values at the time of the last submission

[72] One quarter, or 25%, of the total range of values for a measure. For example, the first quartile would be equivalent to the value at 25%. The third quartile used herein would be equivalent to the value at 75%.

- The forecast for the next price path is 5.5%
- The range of technology spend is typically between 3.2% to 5.2% of total costs or revenue;
- We can also see clear evidence of the trend in the continuing shift from capex to opex in the digital spend profile.

Table 5-8 - Digital expenditure analysis

	Current period actuals and FY25 forecast	Next period proposed
% digital capex of totex	3.2%	2.0%
% digital opex of totex	3.7%	3.4%
% digital of totex	**7.0%**	**5.5%**
Digital capex split	*46.4%*	*37.1%*
Digital opex split	*53.6%*	*62.9%*

Source: Sydney Water Proposal with Capex and Opex adjusted for propex analysis in RFI 92

Table 5-9 – Digital spend benchmarking analysis from Australia, UK and globally

Comparisons	Digital totex as % of total expenditure	Costs or revenue?
Gartner survey of global mid-sized utilities (2022)	4.2%	Total revenue
Deloitte CIO cross industry global survey (2018)	3.6%	Total revenue
SA Water Regulatory Business Plan (2023)	3.9%	Total revenue
Yarra Valley Water 2023-28 Price Submission	5.2% or 6.5%[73]	Total revenue
Sunwater 2026-29 from 2024 Price Submission	3.7%[74]	Total revenue
Northumbrian Water (UK) 2015-2020 Business Plan	3.2%	Total costs
Yorkshire Water (UK) 2015-2020 Business Plan	4.3%	Total costs
Severn Trent Water (UK) 2015-2020 Business Plan	5.0%	Total costs
Anglian Water (UK) 2015-2020 Business Plan	5.0%	Total costs

Sources: Analysis from Gartner, "IT Key Metrics Data 2023: Industry Measures - Insights for Midsize Enterprises", December 2022; Deloitte Insights, CIO Insider: Reinventing tech finance: The evolution from IT budgets to technology investments. January 2020; FTI Consulting, Review of ICT capital expenditure for SA Water for ESCOSA, November 2023; AtkinsRéalis Cardno Sydney Water Corporation Expenditure and Demand Forecast Review for IPART, 2020; and AtkinsRéalis Sunwater Expenditure Review, 2024.

[73] For Yarra Valley Water, the percentage depends on whether an "at risk" item of expenditure is included or excluded from the analysis. It would be 6.5% if included although FTI Consulting suggested that it was more appropriate to exclude.

[74] Sunwater's spend does not include Operational Technology, which sits under its 'Project' expenditure budgets and means it is not a like for like comparison as Sydney Water's spend includes OT.

5.4 Recommended expenditure scenarios

5.4.1 Capex

5.4.1.1 FY25

For FY25, we understand that the likely outturn for project capex will be -$5M to -$10M less than forecast in Sydney Water's proposal[75]. We have made an adjustment of -$7.5M as the mid-point.

5.4.1.2 Future price path

We have considered Sydney Water's future capital expenditure proposals and concluded the following:

- There are no activities or projects that could be considered outside the scope of the regulated service.
- While there are some business cases that are still in development, we consider this as standard practice for digital expenditure and does not in itself justify a scope reduction.
- Sydney Water has demonstrated overall that its cost estimating is sufficiently robust and that it is possible to have a high level of confidence in the values derived. While some evidence suggests the Enterprise Asset Management investment may be too high, the overall digital capex budget has been subject to significant challenge and reduction compared with its bottom up derivation and it also represents a value that is lower than in the current price path. We are not proposing any downward adjustment specifically for EAM.

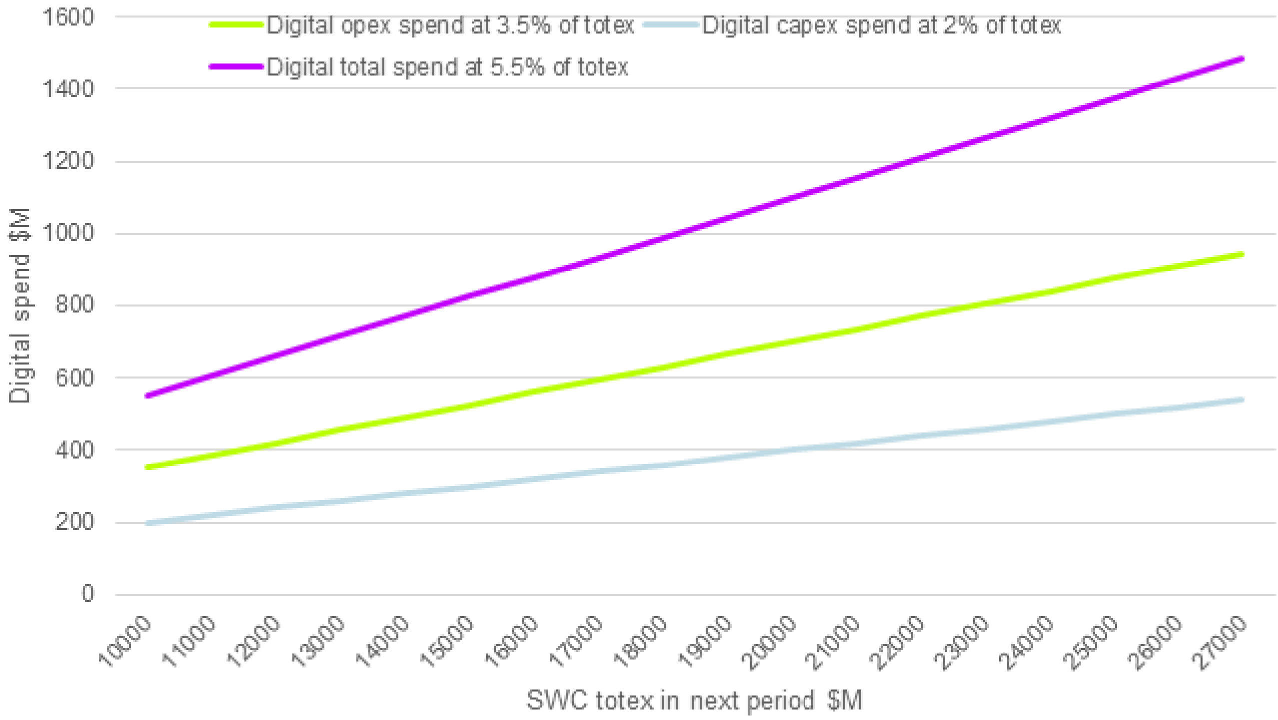
We are not making any adjustments for the upper range boundary as we are of the opinion that this represents the efficient cost of in-scope activities consistent with the proposed service levels and current operating environment.

For the lower range bound, we are proposing that Sydney Water's 5.5% rate of digital spend as a percentage of total expenditure is maintained. This means that there is a case to be made that the investment could be updated in light of the other adjustments made to the total expenditure. This should be done on the same basis of the split between digital capex and opex, which is 2.0% and 3.5% respectively[76].

For illustrative purposes, if the total expenditure allowed is $23,000M, this would translate into a digital capital program of $468.6M compared with Sydney Water's proposal of $26,400 and $537.9M. We think there are at least two major risks in reducing Sydney Water's digital expenditure. The first would be that the business would have to prioritise its investments based on mandatory obligations, such as cyber security, and maintaining capability for basic business needs, which could jeopardise the implementation of programs that deliver future efficiencies both in 2026-30 and also the 2031-35 periods. There is also the potential risk that Sydney Water would have to carry on using systems that are no longer supported by their suppliers, with the inherent risks that this poses.

[75] Response to question posed at Digital Meeting on 19th November 2024.
[76] These are rounded values for simplicity, the exact percentages have been provided to IPART.

Figure 5-2 – Digital spend required to maintain 5.5% ratio



Source: AtkinsRéalis analysis

Table 5-10 – Digital capex spend at 2% of totex

Totex	Digital capex spend at 2% of totex	Digital total spend at 5.5% of totex	Notes
15,000	306	823	
16,000	326	878	
17,000	346	932	
18,000	367	987	
19,000	387	1042	
20,000	408	1097	
21,000	428	1152	
22,000	448	1207	
23,000	**469**	**1262**	Indicative value used for modelling impact
24,000	489	1316	
25,000	509	1371	
26,000	530	1426	
26,400	**538**	**1448**	Sydney Water's proposed investment level.
27,000	550	1481	

Source: AtkinsRéalis analysis

Table 5-11 – Proposed adjustments to digital capex spend

Area	Sydney Water proposal	Not strongly justified in period	Lower range scenario	Upper range scenario
Approach	Bottom up and top down approach working within a constrained budget, and represents a reduction on the current period	None identified, although we recognise the exact program may vary as a result of changes in the operating environment	Align with digital capex spend at 2% of totex	No change from Sydney Water proposal, recognition that the business is a digitally mature organisation
Expenditure	$537.9M	$0M	The exact value would depend on the size of Sydney Water's revised total expenditure. For illustrative purposes, we have selected a value of $23,000M, which translates into $468.6M	$537.9M
Risks		N/A	Sydney Water would have to focus on mandatory obligations and this would put at risk delivery of future efficiencies enabled by the digital program both in 2026-30 and 2031-35 period and potentially result in the business using unsupported systems	No major risks identified
Advantages		N/A	Sydney Water's digital investment would still be at the higher end of most benchmarking analysis	Future proofing Sydney Water's activities and securing efficiencies delivered through digital initiatives

Source: AtkinsRéalis analysis

5.4.2 Opex

For the Upper range scenario we have identified two adjustments, one for IT Project Opex and also for Digitalisation. Sydney Water has proposed a step change of $52M for propex and we are comfortable with the derivation of this investment. However, there is double counting given that there was $6.6M propex in FY24. We are therefore making a $6.6M per annum reduction as this only constitutes a partial step change. This is a reduction of $32.9M.

Table 5-12 - Proposed IT Project Opex (Propex) upper range adjustment to STEP change

IT Project Opex	2026	2027	2028	2029	2030	Total 2026 to 2030
Sydney Water Proposal						
Corporate	14.3	7.1	4.6	1.2	5.9	33.0
Water	5.1	2.5	1.6	0.4	2.0	11.6
Wastewater	3.1	1.5	1.0	0.3	1.3	7.2
Stormwater	0.1	0.1	0.0	0.0	0.0	0.3
Sydney Water STEP change	**22.6**	**11.2**	**7.3**	**1.8**	**9.3**	**52.2**
Our proposed adjustment	-6.6	-6.6	-6.6	-6.6	-6.6	-32.9
Upper range STEP change (all moved to Corporate)	**16.0**	**4.6**	**0.7**	**-4.8**	**2.7**	**19.2**

Source: SIR and Sydney Water Proposal and RFI 92 Propex analysis

We are also unconvinced by the level of step change expenditure for some items in the digitalisation category. While we think there is reasonable justification for the software licencing and SCADA and Ops Control increases, we have not seen strong justification for the increases in managed services and cloud services which are both 43% above the core opex costs. Part of our reasoning is that this expenditure is linked to delivery of projects but we have already seen in the current price path that a reasonable number are delivered later than planned. We therefore think it is reasonable to assume that the recurring opex costs will hit later and/or the derivation of costs is conservative and that the actuals will be lower. We have applied a 20% reduction to account for the uncertainty against each item which equates to a reduction of $15M and $9M respectively.

Table 5-13 - Proposed Digitalisation upper range adjustment for managed and cloud services step change

Digitalisation Opex	2026	2027	2028	2029	2030	Total 2026 to 2030
Sydney Water Proposal						
Corporate	17.9	23.7	28.2	29.8	31.4	131.1
Water	3.5	3.1	3.2	3.6	3.8	17.1
Wastewater	2.1	1.9	2.0	2.3	2.5	10.7
Stormwater`	0.1	0.1	0.1	0.1	0.1	0.4
Sydney Water STEP change	**23.6**	**28.8**	**33.4**	**35.7**	**37.8**	**159.3**
Our proposed adjustment	-3.6	-4.4	-5.1	-5.4	-5.8	-24.3
Upper range STEP change (all moved to Corporate)	**20.0**	**24.4**	**28.3**	**30.2**	**32.0**	**135.0**

Source: SIR and Sydney Water Proposal

As discussed above in the Opex section, we are also proposing to move all the expenditure from Water, Wastewater and Stormwater to Corporate, where we believe it sits better.

For the Lower range scenario, we are following the same logic as set out above for capex, by proposing that Sydney Water's 5.5% rate of digital spend as a percentage of total expenditure is maintained. We have assumed that this is applied on the same basis of the split between digital capex and opex, which is 2.0% and 3.5% respectively. The distinction between the upper and lower range is that the lower range is not an adjustment specifically of Sydney Water's Digitalisation Step Change, it is an adjustment of its overall Digital opex.

Table 5-14 - Proposed Digital lower range step adjustment for maintaining 3.5% totex ratio

Digital Opex	2026	2027	2028	2029	2030	Total 2026 to 2030
Reduction in step digital opex	-17.3	-21.2	-24.6	-26.3	-27.8	**-117.2**

Source: AtkinsRéalis analysis

Table 5-15 – Digital opex spend at 3.5% of totex

Totex	Digital opex spend at 3.5% of totex	Digital total spend at 5.5% of totex	Notes
15,000	517	823	
16,000	552	878	
17,000	586	932	
18,000	621	987	
19,000	655	1042	
20,000	690	1097	
21,000	724	1152	
22,000	759	1207	
23,000	**793**	**1262**	Indicative value used for modelling impact
24,000	827	1316	
25,000	862	1371	
26,000	896	1426	
26,400	**910**	**1448**	Sydney Water's proposed investment level.
27,000	931	1481	

Source: AtkinsRéalis analysis

Table 5-16 – Proposed adjustments to digital opex spend

Area	Sydney Water proposal	Not strongly justified in period	Lower range scenario	Upper range scenario
Approach	Baseline opex for FY24 adjusted for step changes	Propex step change reduced as already included in the FY24 base year and Digitalisation reduced as managed and cloud services level of increase not sufficiently justified	Align with digital opex spend at 3.5% of totex,, over and above the minimum $57.3M adjustment recommended	Promoting a digitally mature and leading utility, continuing to develop at pace. Only changes are propex $32.9M and digitalisation $24.3M adjustments
Expenditure	$910M	$57M	The exact value would depend on the size of Sydney Water's revised total expenditure. For illustrative purposes, we have selected a value of $23,000M, which translates into a reduction of $117M to $793M	$853M
Risks	N/A	N/A	Sydney Water would have to revisit its entire digital strategy, focus on mandatory obligations, likely reduce labour costs and this would put at risk delivery of future efficiencies enabled by the digital program both in 2026-30 and 2031-35 period and potentially result in the business using unsupported systems	No major risks identified
Advantages		N/A	Sydney Water's overall digital investment would still be at the higher end of most benchmarking analysis	Future proofing Sydney Water's activities and securing efficiencies delivered through digital initiatives

Source: AtkinsRéalis analysis

APPENDICES

Appendix A. Scope of Works

This appendix presents an extract from the IPART scope of works for water expenditure reviews for Sydney Water as provided at tender stage, for information purposes.

Objectives

The objectives of this consultancy are:

- a high-level review of each business's proposal in terms of the expenditure it is planning, and how that expenditure is justified
- a more detailed review of key elements of each business's proposed operating expenditures and capital expenditures for efficiency and deliverability
- an overall assessment of whether the level of risk each business is taking (both financially and operationally) is appropriate.

Description of services

Tasks in a complete expenditure review

Assuming IPART chooses to conduct a complete expenditure review (see quoting section below), there are 2 main tasks:

- Review of forecast operating expenditure
- Review of forecast capital expenditure.

Task 1 Detailed review of operating expenditure

As part of the price review, IPART will make a decision on the efficient operating expenditure in each year of the next determination period.

To assist IPART in this task, the consultant is required to assess the adequacy, appropriateness and efficiency of the business's levels of operating expenditure. The consultant must assess and report on the business's operating expenditure: for the period from 1 July 2025 to 30 June 2030.

1. Historical operating expenditure: for the period 1 July 2020 to 30 June 2025.

   In undertaking this task, the consultant should:

   a. Review the variations in operating expenditure from what was allowed in the 2020 price determination for the business and, where assessed as material, comment on the reasons for this variation
   b. Comment on the extent to which the operating expenditure incurred since the last determination has delivered the service standards on which the expenditure allowance was based
2. Proposed operating expenditure: for the period 1 July 2025 to 30 June 2030.

The consultant must assess, report and provide recommendations on the efficient level of proposed operating expenditure. Under the 3Cs framework, businesses will use a 'base-step- trend' approach to calculating operating expenditure. That is, expenditure will be made up of:

a. Base – the efficient recurring expenditure required each year (reflecting genuine recurring expenditure and taking into account an efficient business's costs on average over the range of likely conditions over the period.)
b. Step – changes that are typically the result of new requirements or new ways of doing things, so past expenditure or trends cannot predict this change in expenditure.
c. Trend – the predictable change in recurring expenditure over time due to input price changes, population/demand growth and improvements in productivity.

The consultant will need to review all 3 components, assessing whether assumptions are reasonable, and costs are efficient. In particular, it will be essential to interrogate the 'base' component of costs, because costs in this base feed into financial incentive mechanisms.

In making its recommendations, the consultant should consider how a reasonably efficient business in a reasonably competitive market might respond to the challenges of those market forces over time. This may include considering how a business in that environment would:

- have sought to optimise its mix of operating cost inputs
- invest in business efficiency initiatives and systems
- seek to engage with third-party providers, or in this case the private sector.

Task 2 Detailed review of capital expenditure

The consultant will be required to undertake a detailed review of the business's planned capital expenditure from 2024-25 to 2029-30. This should include an assessment of the reasonableness of the business's capital program as a whole, within the context of its long-term plans and the assumptions underlying them.

In undertaking this task, the consultant must for each year from 2024-25 to 2029-30 make recommendations on the efficient level of capital expenditure in each service, namely:

- Water
- Wastewater
- Stormwater.

In making its recommendations, the consultant should have reference to the maturity and effectiveness of Sydney Water's key business systems and processes, including its:

- Asset Management System
- Risk Management System
- Procurement processes
- Cost estimation,

In making its recommendations, the consultant should consider the deliverability of Sydney Water's proposed capital program. This includes any relevant finding relating to:

- Sydney Water's internal capacity to efficiently increase its capital annual expenditure by more than 100%
- The capacity of the infrastructure sector to deliver the program.

While not a prominent feature of the 3Cs framework, we may also require the consultant to review the efficiency of capital expenditure in certain circumstances, or as required. IPART will agree with the consultant up-front (once the business proposals are in) if this is required.

Task 3 Review of long-term capital and operational plan

Sydney Water has developed a 25-yr long-term capital and operational plan (LTCoP). The LTCoP forms the basis of Sydney Water's future capital expenditure – including its proposed expenditure from 2025 to 2030.

In making its findings and recommendations in Tasks 1 and 2 above, the consultant must:

- make comment on the drivers and efficiency of the LTCoP, in particular the annual capital expenditure in the 10-years to 2034-35,

Providing a range of efficient expenditure

In assessing expenditure, the consultant should provide a range of efficient expenditure (not a point estimate). The consultant should also provide clear advice to IPART on the factors that would inform how it should reach a decision within that range. This is in recognition that businesses' proposals are multi-dimensional – a balance of cost, performance, and risk, and so a degree of uncertainty in project scope and costs is inevitable.

The range should cover 2 scenarios:

- Low case: the minimum expenditure that the business needs to conduct its essential operations (ie any projects that could be deferred, are deferred)
- High case: the efficient expenditure that the business needs in order to continue to grow and set up for success into the future.

Considerations in conducting the expenditure review

In reviewing both capital and operating expenditure, consultants should have regard to a range of broader issues including:

Sydney Water's long term investment planning and asset management practices and processes

The consultant should review Sydney Water's LTCoP (minimum of 10 years) so that the medium term (ie, proposals for the 5 years of the determination period) can be considered in the context of its longer-term plans.

The consultant should consider:

a. Whether the longer-term capital investment strategy is the most efficient, and whether processes supporting this including procurement processes, whole of life cycle planning and assessment of capital and operating expenditure trade-offs are best-practice and therefore likely to result in prudent and efficient investment decisions
b. The key assumptions that are driving expenditure (eg, asset replacements, demand forecasts, growth assessments, environmental requirements, licensing standards), including comment on the reasonableness of these assumptions and how they have been considered and tested by the business
c. The consistency of the business's proposed medium term capital expenditure program with its longer-term program of capital expenditure

d. The robustness of systems for linking asset management decisions with current and future levels of service and performance requirements

Sydney Water's attitude to risk

Sydney Water is a monopoly service provider, and so may not face strong market forces that govern its attitude to risk. The consultant should look at Sydney Water's approach to risk wholistically, and comment on:

e. Whether Sydney Water is optimising trade-offs between prices and service levels efficiently (that is, in a way that a competitive business might)
f. Employing an appropriate level of risk when planning for asset renewals and service growth. This may include whether:
   - Sydney Water's *risk appetite* is appropriate
   - Sydney Water's actual and/or forecast *risk position* is in line with the efficient risk appetite.
g. The sophistication of any risk systems that Sydney Water uses to inform decision-making.

Ambition in cost efficiency strategy

Under the 3Cs model, businesses are required to propose and justify a cost efficiency strategy which includes an annual efficiency factor for both capex and opex. The consultant should review this efficiency strategy and assess whether it is justified/appropriate.

Appendix B. Capex expenditure ranges

B.1 Wastewater capex adjustments

TOTAL WW capex	2025	2026	2027	2028	2029	2030
Sydney Water Proposal						
Depreciable assets	1,394	1,391	1,563	1,515	1,579	1,817
Non-depreciable assets	276	441	179	167	71	221
Total	1,670	1,832	1,742	1,682	1,650	2,038
Scope adjustments						
Depreciable assets	40	(198)	(231)	(301)	(402)	(415)
Non-depreciable assets	1	(28)	(10)	(8)	(7)	(15)
Total	41	(226)	(241)	(309)	(408)	(430)
Efficiency adjustments						
Depreciable assets	(9)	(21)	(23)	(16)	(14)	(16)
Non-depreciable assets	-	(3)	(1)	(1)	(1)	(2)
Total	(9)	(24)	(24)	(17)	(14)	(17)
Efficiency challenge						
Depreciable assets	-	(3)	(7)	(9)	(13)	(15)
Non-depreciable assets	-	(0)	(0)	(0)	(0)	(0)
Total	-	(4)	(7)	(10)	(13)	(15)
check	-	-	-	-	-	-
Upper Range						
Depreciable assets	1,425	1,168	1,303	1,189	1,151	1,371
Non-depreciable assets	276	410	168	158	64	204
Total	1,702	1,578	1,471	1,346	1,215	1,575
Service level changes						
Depreciable assets	(58)	(57)	(57)	(59)	(59)	(59)
Non-depreciable assets	(1)	(2)	(2)	(0)	(0)	(0)
Total	(59)	(59)	(59)	(59)	(59)	(59)
Other potential assumption changes						
Depreciable assets	-	(141)	(160)	(147)	(132)	(175)
Non-depreciable assets	-	(48)	(16)	(14)	(10)	(25)
Total	-	(189)	(176)	(161)	(142)	(200)
Potential savings from operating environment changes						
Depreciable assets	(32)	(32)	(32)	(32)	(32)	(32)
Non-depreciable assets	-	-	-	-	-	-
Total	(32)	(32)	(32)	(32)	(32)	(32)
Efficiency challenge						
Depreciable assets	-	(3)	(5)	(8)	(10)	(12)
Non-depreciable assets	-	(0)	(0)	(0)	(0)	(0)
Total	-	(3)	(5)	(8)	(10)	(12)
Lower Range						
Depreciable assets	1,335	939	1,055	952	931	1,108
Non-depreciable assets	275	360	150	143	53	179
Total	1,610	1,299	1,205	1,096	984	1,287

WW capex GROWTH	2025	2026	2027	2028	2029	2030	
Sydney Water Proposal							
Depreciable assets	914	959	1,093	1,004	893	1,202	
Non-depreciable assets	228	339	113	100	71	177	
Total	1,142	1,298	1,206	1,103	964	1,380	5,952
Scope adjustments							
Depreciable assets		(181)	(192)	(185)	(176)	(201)	
Non-depreciable assets		(27)	(9)	(8)	(6)	(14)	
Total	-	(209)	(201)	(193)	(182)	(215)	(1,000)
Efficiency adjustments							
Depreciable assets		(10)	(11)	(10)	(9)	(12)	
Non-depreciable assets		(3)	(1)	(1)	(1)	(2)	
Total	-	(13)	(12)	(11)	(10)	(14)	(60)
Efficiency challenge	not applied to growth						
Depreciable assets							
Non-depreciable assets							
Total	-	-	-	-	-	-	
Upper Range							
Depreciable assets	914	768	890	809	708	989	
Non-depreciable assets	228	309	103	91	65	162	
Total	1,142	1,076	993	899	773	1,151	
Service level changes							
Depreciable assets							
Non-depreciable assets							
Total	-	-	-	-	-	-	
Other potential assumption changes							
Depreciable assets		(141)	(160)	(147)	(132)	(175)	
Non-depreciable assets		(48)	(16)	(14)	(10)	(25)	
Total	-	(189)	(176)	(161)	(142)	(200)	(868)
Potential savings from operating environment changes							
Depreciable assets							
Non-depreciable assets							
Total	-	-	-	-	-	-	
Efficiency challenge	not applied to growth						
Depreciable assets							
Non-depreciable assets							
Total	-	-	-	-	-	-	
Lower Range							
Depreciable assets	914	627	730	662	577	814	
Non-depreciable assets	228	261	87	77	55	136	
Total	1,142	888	817	738	631	950	

WW capex RENEWALS	2025	2026	2027	2028	2029	2030
Sydney Water Proposal						
Depreciable assets	431	424	430	505	609	596
Non-depreciable assets	7	15	13	2	2	2
Total	438	439	443	507	611	599
Scope adjustments						
Depreciable assets	40	(17)	(39)	(116)	(225)	(214)
Non-depreciable assets	1	(1)	(1)	(0)	(1)	(1)
Total	41	(17)	(40)	(116)	(226)	(215)
Efficiency adjustments						
Depreciable assets	-	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	-	-	-	-	-
Efficiency challenge						
Depreciable assets	-	(3)	(5)	(8)	(11)	(13)
Non-depreciable assets	-	(0)	(0)	(0)	(0)	(0)
Total	-	(3)	(6)	(8)	(11)	(13)
Upper Range						
Depreciable assets	472	405	386	381	373	369
Non-depreciable assets	7	14	12	1	1	1
Total	479	419	397	383	374	370
Service level changes						
Depreciable assets	(58)	(57)	(57)	(59)	(59)	(59)
Non-depreciable assets	(1)	(2)	(2)	(0)	(0)	(0)
Total	(59)	(59)	(59)	(59)	(59)	(59)
Other potential assumption changes						
Depreciable assets	-	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	-	-	-	-	-
Potential savings from operating environment changes						
Depreciable assets	-	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	-	-	-	-	-
Efficiency challenge						
Depreciable assets	-	(2)	(5)	(7)	(9)	(11)
Non-depreciable assets	-	(0)	(0)	(0)	(0)	(0)
Total	-	(3)	(5)	(7)	(9)	(11)
Lower Range						
Depreciable assets	414	348	329	324	316	312
Non-depreciable assets	7	12	10	1	1	1
Total	420	361	339	325	317	313

WW capex COMPLIANCE	2025	2026	2027	2028	2029	2030
Sydney Water Proposal						
Depreciable assets	68	67	67	63	61	60
Non-depreciable assets	-	-	-	-	-	-
Total	68	67	67	63	61	60
Scope adjustments						
Depreciable assets	-	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	-	-	-	-	-
Efficiency adjustments						
Depreciable assets	(9)	(11)	(12)	(6)	(5)	(4)
Non-depreciable assets	-	-	-	-	-	-
Total	(9)	(11)	(12)	(6)	(5)	(4)
Efficiency challenge						
Depreciable assets	-	(0)	(1)	(1)	(2)	(2)
Non-depreciable assets	-	-	-	-	-	-
Total	-	(0)	(1)	(1)	(2)	(2)
Upper Range						
Depreciable assets	59	56	55	56	55	54
Non-depreciable assets	-	-	-	-	-	-
Total	59	56	55	56	55	54
Service level changes						
Depreciable assets	-	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	-	-	-	-	-
Other potential assumption changes						
Depreciable assets	-	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	-	-	-	-	-
Potential savings from operating environment changes						
Depreciable assets	(32)	(32)	(32)	(32)	(32)	(32)
Non-depreciable assets	-	-	-	-	-	-
Total	(32)	(32)	(32)	(32)	(32)	(32)
Efficiency challenge						
Depreciable assets	-	(0)	(0)	(1)	(1)	(1)
Non-depreciable assets	-	-	-	-	-	-
Total	-	(0)	(0)	(1)	(1)	(1)
Lower Range						
Depreciable assets	27	24	23	24	24	23
Non-depreciable assets	-	-	-	-	-	-
Total	27	24	23	24	24	23

WW capex IMPROVEMENTS	2025	2026	2027	2028	2029	2030
Sydney Water Proposal						
Depreciable assets	22	27	26	9	13	-
Non-depreciable assets	-	-	-	-	-	-
Total	22	27	26	9	13	-
Scope adjustments						
Depreciable assets	-	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	-	-	-	-	-
Efficiency adjustments						
Depreciable assets	-	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	-	-	-	-	-
Efficiency challenge						
Depreciable assets	-	(0)	(0)	(0)	(0)	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	(0)	(0)	(0)	(0)	-
Upper Range						
Depreciable assets	22	27	26	9	12	-
Non-depreciable assets	-	-	-	-	-	-
Total	22	27	26	9	12	-
Service level changes						
Depreciable assets	-	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	-	-	-	-	-
Other potential assumption changes						
Depreciable assets	-	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	-	-	-	-	-
Potential savings from operating environment changes						
Depreciable assets	-	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	-	-	-	-	-
Efficiency challenge						
Depreciable assets	-	(0)	(0)	(0)	(0)	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	(0)	(0)	(0)	(0)	-
Lower Range						
Depreciable assets	22	27	26	9	12	-
Non-depreciable assets	-	-	-	-	-	-
Total	22	27	26	9	12	-

B.2 Water capex adjustments

TOTAL Water capex (including Recycled Water)	2025	2026	2027	2028	2029	2030
Sydney Water Proposal						
Depreciable assets	752	1,076	1,392	1,340	1,242	1,011
Non-depreciable assets	13	113	29	26	72	66
Total	765	1,190	1,421	1,366	1,314	1,076
Scope adjustments						
Depreciable assets	12	(145)	(144)	(273)	(321)	(284)
Non-depreciable assets	0	(13)	(4)	(7)	(6)	(8)
Total	12	(158)	(148)	(279)	(327)	(292)
Efficiency adjustments						
Depreciable assets	-	(5)	(8)	(8)	(9)	(7)
Non-depreciable assets	-	(2)	(1)	(1)	(1)	(1)
Total	-	(7)	(8)	(9)	(9)	(7)
Efficiency challenge						
Depreciable assets	-	(4)	(9)	(9)	(7)	(8)
Non-depreciable assets	-	(0)	(0)	(0)	(0)	(0)
Total	-	(4)	(9)	(9)	(7)	(9)
Upper Range						
Depreciable assets	764	922	1,232	1,050	905	712
Non-depreciable assets	13	99	24	19	66	57
Total	776	1,021	1,256	1,069	970	769
Service level changes						
Depreciable assets	(154)	(299)	(420)	(239)	(92)	(76)
Non-depreciable assets	(1)	(4)	(6)	(0)	(0)	(0)
Total	(155)	(303)	(426)	(239)	(92)	(76)
Other potential assumption changes						
Depreciable assets	-	(78)	(114)	(120)	(131)	(100)
Non-depreciable assets	-	(25)	(11)	(11)	(10)	(13)
Total	-	(103)	(125)	(131)	(140)	(113)
Potential savings from operating environment changes						
Depreciable assets	-	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	-	-	-	-	-
Efficiency challenge						
Depreciable assets	-	(2)	(3)	(4)	(5)	(6)
Non-depreciable assets	-	(0)	(0)	(0)	(0)	(0)
Total	-	(2)	(3)	(4)	(5)	(6)
Lower Range						
Depreciable assets	609	547	704	697	685	540
Non-depreciable assets	12	71	8	7	56	43
Total	621	617	712	704	740	583

Water capex GROWTH	2025	2026	2027	2028	2029	2030	
Sydney Water Proposal							
Depreciable assets	322	500	752	794	873	651	
Non-depreciable assets	80	177	78	79	69	96	
Total	403	677	830	873	942	747	4,069
Scope adjustments							
Depreciable assets		(189)	(209)	(213)	(219)	(201)	
Non-depreciable assets		(14)	(6)	(6)	(6)	(8)	
Total	-	(203)	(215)	(219)	(224)	(209)	(1,071)
Efficiency adjustments							
Depreciable assets		(5)	(8)	(8)	(9)	(7)	
Non-depreciable assets		(2)	(1)	(1)	(1)	(1)	
Total	-	(7)	(8)	(9)	(9)	(7)	(41)
Efficiency challenge	not applied to growth						
Depreciable assets							
Non-depreciable assets							
Total	-	-	-	-	-	-	
Upper Range							
Depreciable assets	322	306	535	573	645	443	
Non-depreciable assets	80	161	71	72	63	87	
Total	403	467	606	645	708	531	
Service level changes							
Depreciable assets							
Non-depreciable assets							
Total	-	-	-	-	-	-	
Other potential assumption changes							
Depreciable assets		(78)	(114)	(120)	(131)	(100)	
Non-depreciable assets		(25)	(11)	(11)	(10)	(13)	
Total	-	(103)	(125)	(131)	(140)	(113)	(612)
Potential savings from operating environment changes							
Depreciable assets							
Non-depreciable assets							
Total	-	-	-	-	-	-	
Efficiency challenge	not applied to growth						
Depreciable assets							
Non-depreciable assets							
Total	-	-	-	-	-	-	
Lower Range							
Depreciable assets	322	228	421	454	514	344	
Non-depreciable assets	80	136	60	61	53	74	
Total	403	364	481	515	568	418	

Water capex RENEWALS	2025	2026	2027	2028	2029	2030
Sydney Water Proposal						
Depreciable assets	257	306	344	353	344	328
Non-depreciable assets	4	11	10	1	1	1
Total	261	316	355	354	345	329
Scope adjustments						
Depreciable assets	12	46	66	(60)	(102)	(82)
Non-depreciable assets	0	2	2	(0)	(0)	(0)
Total	12	47	67	(60)	(103)	(83)
Efficiency adjustments						
Depreciable assets	-	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	-	-	-	-	-
Efficiency challenge						
Depreciable assets	-	(2)	(6)	(6)	(7)	(8)
Non-depreciable assets	-	(0)	(0)	(0)	(0)	(0)
Total	-	(3)	(6)	(6)	(7)	(9)
Upper Range						
Depreciable assets	269	349	404	287	235	237
Non-depreciable assets	4	12	12	1	1	1
Total	274	361	416	288	236	238
Service level changes						
Depreciable assets	(54)	(105)	(183)	(100)	(65)	(76)
Non-depreciable assets	(1)	(4)	(6)	(0)	(0)	(0)
Total	(55)	(108)	(189)	(100)	(65)	(76)
Other potential assumption changes						
Depreciable assets	-	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	-	-	-	-	-
Potential savings from operating environment changes						
Depreciable assets	-	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	-	-	-	-	-
Efficiency challenge						
Depreciable assets	-	(2)	(3)	(4)	(5)	(6)
Non-depreciable assets	-	(0)	(0)	(0)	(0)	(0)
Total	-	(2)	(3)	(4)	(5)	(6)
Lower Range						
Depreciable assets	215	245	223	189	172	164
Non-depreciable assets	3	9	7	1	1	1
Total	218	253	230	190	172	165

Water capex COMPLIANCE	2025	2026	2027	2028	2029	2030
Sydney Water Proposal						
Depreciable assets	101	196	237	139	27	-
Non-depreciable assets	-	-	-	-	-	-
Total	101	196	237	139	27	-
Scope adjustments						
Depreciable assets	(1)	(2)	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	(1)	(2)	-	-	-	-
Efficiency adjustments						
Depreciable assets	-	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	-	-	-	-	-
Efficiency challenge						
Depreciable assets	-	(1)	(3)	(3)	(1)	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	(1)	(3)	(3)	(1)	-
Upper Range						
Depreciable assets	100	193	234	136	26	-
Non-depreciable assets	-	-	-	-	-	-
Total	100	193	234	136	26	-
Service level changes						
Depreciable assets	(100)	(195)	(237)	(139)	(27)	-
Non-depreciable assets	-	-	-	-	-	-
Total	(100)	(195)	(237)	(139)	(27)	-
Other potential assumption changes						
Depreciable assets	-	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	-	-	-	-	-
Potential savings from operating environment changes						
Depreciable assets	-	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	-	-	-	-	-
Efficiency challenge						
Depreciable assets	-	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	-	-	-	-	-
Lower Range						
Depreciable assets	(0)	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	(0)	-	-	-	-	-

Water capex IMPROVEMENTS	2025	2026	2027	2028	2029	2030
Sydney Water Proposal						
Depreciable assets	-	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	-	-	-	-	-
Scope adjustments						
Depreciable assets						
Non-depreciable assets						
Total	-	-	-	-	-	-
Efficiency adjustments						
Depreciable assets						
Non-depreciable assets						
Total	-	-	-	-	-	-
Efficiency challenge						
Depreciable assets	-	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	-	-	-	-	-
Upper Range						
Depreciable assets	-	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	-	-	-	-	-
Service level changes						
Depreciable assets						
Non-depreciable assets						
Total	-	-	-	-	-	-
Other potential assumption changes						
Depreciable assets						
Non-depreciable assets						
Total	-	-	-	-	-	-
Potential savings from operating environment changes						
Depreciable assets						
Non-depreciable assets						
Total	-	-	-	-	-	-
Efficiency challenge						
Depreciable assets	-	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	-	-	-	-	-
Lower Range						
Depreciable assets	-	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	-	-	-	-	-

B.3 Stormwater capex adjustments

TOTAL Stormwater capex	2025	2026	2027	2028	2029	2030
Sydney Water Proposal						
Depreciable assets	46	52	52	51	54	55
Non-depreciable assets	0	0	0	0	0	0
Total	47	52	52	51	54	55
Scope adjustments						
Depreciable assets	(20)	(25)	(24)	(25)	(27)	(28)
Non-depreciable assets	(0)	(1)	(1)	(0)	(0)	(0)
Total	(20)	(26)	(25)	(25)	(27)	(29)
Efficiency adjustments						
Depreciable assets	-	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	-	-	-	-	-
Efficiency challenge						
Depreciable assets	-	(0)	(0)	(1)	(1)	(1)
Non-depreciable assets	-	(0)	(0)	(0)	(0)	(0)
Total	-	(0)	(0)	(1)	(1)	(1)
Upper Range						
Depreciable assets	27	27	27	26	27	26
Non-depreciable assets	(0)	(1)	(1)	0	0	0
Total	26	26	26	26	27	26
Service level changes						
Depreciable assets	-	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	-	-	-	-	-
Other potential assumption changes						
Depreciable assets	-	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	-	-	-	-	-
Potential savings from operating environment changes						
Depreciable assets	-	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	-	-	-	-	-
Efficiency challenge						
Depreciable assets	-	(0)	(0)	(1)	(1)	(1)
Non-depreciable assets	-	(0)	(0)	(0)	(0)	(0)
Total	-	(0)	(0)	(1)	(1)	(1)
Lower Range						
Depreciable assets	27	27	27	26	27	26
Non-depreciable assets	(0)	(1)	(1)	0	0	0
Total	26	26	26	26	27	26

Stormwater capex GROWTH	2025	2026	2027	2028	2029	2030
Sydney Water Proposal						
Depreciable assets	0	1	1	0	0	0
Non-depreciable assets	0	0	0	0	0	0
Total	0	1	1	0	0	0
Scope adjustments						
Depreciable assets						
Non-depreciable assets						
Total	-	-	-	-	-	-
Efficiency adjustments						
Depreciable assets						
Non-depreciable assets						
Total	-	-	-	-	-	-
Efficiency challenge	not applied to growth					
Depreciable assets						
Non-depreciable assets						
Total	-	-	-	-	-	-
Upper Range						
Depreciable assets	0	1	1	0	0	0
Non-depreciable assets	0	0	0	0	0	0
Total	0	1	1	0	0	0
Service level changes						
Depreciable assets						
Non-depreciable assets						
Total	-	-	-	-	-	-
Other potential assumption changes						
Depreciable assets						
Non-depreciable assets						
Total	-	-	-	-	-	-
Potential savings from operating environment changes						
Depreciable assets						
Non-depreciable assets						
Total	-	-	-	-	-	-
Efficiency challenge	not applied to growth					
Depreciable assets						
Non-depreciable assets						
Total	-	-	-	-	-	-
Lower Range						
Depreciable assets	0	1	1	0	0	0
Non-depreciable assets	0	0	0	0	0	0
Total	0	1	1	0	0	0

Stormwater capex RENEWALS	2025	2026	2027	2028	2029	2030
Sydney Water Proposal						
Depreciable assets	45	49	49	51	54	55
Non-depreciable assets	1	2	1	0	0	0
Total	46	51	51	51	54	55
Scope adjustments						
Depreciable assets	(20)	(25)	(24)	(25)	(27)	(28)
Non-depreciable assets	(0)	(1)	(1)	(0)	(0)	(0)
Total	(20)	(26)	(25)	(25)	(27)	(29)
Efficiency adjustments						
Depreciable assets	-	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	-	-	-	-	-
Efficiency challenge						
Depreciable assets	-	(0)	(0)	(1)	(1)	(1)
Non-depreciable assets	-	(0)	(0)	(0)	(0)	(0)
Total	-	(0)	(0)	(1)	(1)	(1)
Upper Range						
Depreciable assets	26	24	25	26	27	26
Non-depreciable assets	0	1	1	0	0	0
Total	26	25	25	26	27	26
Service level changes						
Depreciable assets	-	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	-	-	-	-	-
Other potential assumption changes						
Depreciable assets	-	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	-	-	-	-	-
Potential savings from operating environment changes						
Depreciable assets	-	-	-	-	-	-
Non-depreciable assets	-	-	-	-	-	-
Total	-	-	-	-	-	-
Efficiency challenge						
Depreciable assets	-	(0)	(0)	(1)	(1)	(1)
Non-depreciable assets	-	(0)	(0)	(0)	(0)	(0)
Total	-	(0)	(0)	(1)	(1)	(1)
Lower Range						
Depreciable assets	26	24	25	26	27	26
Non-depreciable assets	0	1	1	0	0	0
Total	26	25	25	26	27	26

B.4 Corporate capex adjustments

Corporate capex							
		2025	2026	2027	2028	2029	2030
Sydney Water Proposal							
Depreciable assets		192	198	179	163	172	154
Non-depreciable assets		15	34	33	4	5	5
Total Corporate		207	233	212	167	177	158
Scope adjustments							
Depreciable assets		-	-	-	-	-	-
Non-depreciable assets		-	-	-	-	-	-
Total Corporate		-	-	-	-	-	-
Efficiency adjustments							
Depreciable assets		(41)	(9)	(20)	-	-	-
Non-depreciable assets		(3)	(1)	(4)	-	-	-
Total Corporate		(44)	(10)	(24)	-	-	-
Efficiency challenge							
Depreciable assets		-	(1)	(2)	(3)	(5)	(5)
Non-depreciable assets		-	(0)	(0)	(0)	(0)	(0)
Total		-	(2)	(3)	(3)	(5)	(5)
Upper Range							
Depreciable assets		151	188	157	160	168	148
Non-depreciable assets		12	33	29	4	5	4
Total Corporate		163	221	185	164	172	153
Service level changes							
Depreciable assets		(5)	(10)	(12)	(15)	(15)	(14)
Non-depreciable assets		(0)	(2)	(2)	(0)	(0)	(0)
Total Corporate		(6)	(12)	(15)	(15)	(15)	(15)
Other potential assumption changes							
Depreciable assets		-	-	-	-	-	-
Non-depreciable assets		-	-	-	-	-	-
Total Corporate		-	-	-	-	-	-
Potential savings from operating environment changes							
Depreciable assets		-	-	-	-	-	-
Non-depreciable assets		-	-	-	-	-	-
Total Corporate		-	-	-	-	-	-
Efficiency challenge							
Depreciable assets		-	(1)	(2)	(3)	(4)	(5)
Non-depreciable assets		-	(0)	(0)	(0)	(0)	(0)
Total		-	(1)	(2)	(3)	(4)	(5)
Lower Range							
Depreciable assets		146	178	144	145	153	135
Non-depreciable assets		11	31	27	4	4	4
Total Corporate		157	209	171	149	157	139

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