Attachment 18

Capital expenditure for infrastructure

30 September 2024

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1. Purpose

This attachment details WaterNSW's proposed infrastructure capital expenditure for the 2025 Determination period for Greater Sydney, Rural Valleys and WAMC. The document explains the process and outcomes of WaterNSW's asset planning to inform:

- the long term capital investment needs of its assets,
- identification of projects that ensure assets can reliably deliver required levels of service to our customers,
- the prioritisation and development of those capital projects for delivery.

WaterNSW's proposed infrastructure capital expenditure for the 2025 Determination period is presented via the following sections:

Background: The influence of WaterNSW's asset history, customer and community needs and regulatory drivers on capital expenditure in the 2025 Determination period.

Infrastructure investment context: Understanding the long-term investment needs of WaterNSW's assets, and the process undertaken to optimise near-term capital expenditure to strike an appropriate balance between asset risk and customer prices.

Asset management planning: How WaterNSW's asset management planning identifies long-term infrastructure capital investment needs and prioritises near-term capital works.

Capital program development: The process by which WaterNSW identified and prioritised the infrastructure capital projects included in the IPART submission.

Proposed infrastructure capital program: The value and composition of capital program for the 2025 Determination period for Greater Sydney, Rural Valleys and WAMC.

Historical performance: Summary of WaterNSW's actual capital delivery versus IPART allowances in the current determination periods.

Capital program delivery: How early scope development of candidate projects and master schedule planning were utilised to develop an achievable and efficient capital program. The WaterNSW procurement arrangements and increased project delivery capability will be leveraged to deliver the capital program.

Further details on the assets, customer base, historical performance and how prudent levels of investment were determined within individual valleys are contained within individual valley-based Investment Business Cases.

2 Background

2.1 Asset context

WaterNSW manages the bulk supply of raw water to the Greater Sydney region and regional NSW, supplying more than two thirds of the water used across NSW. This includes management of water through more than 7,000km of natural waterways, spread across 13 'regulated' valleys as well as Greater Sydney. To achieve this, WaterNSW relies upon an extensive portfolio of infrastructure assets including 41 major dams, over 300 on river diversion structures (weirs and regulators), 300km of major pipelines, 200km of engineered channels, as well as a large portfolio of bridges, roads and other supporting infrastructure. These assets are spread across the state of NSW.

Construction of our asset portfolio occurred in several phases, predominantly between the late 19th century through to the 1960's. A number of significant assets were constructed after World War II and will reach the end

of their 90 to 100 year lifespans into the 2040s. Long term modelling shows an expected increase in capital expenditure in several Rural Valleys into the 2040s as these assets are renewed.

Since its creation in 2014 WaterNSW has sought to 'close the gap' caused by several decades of under investment in maintenance and renewals. We are committed to managing our water infrastructure efficiently and sustainably, however we face several challenges:

- Our assets are aging, with many components approaching the end of life.
- Due to their age, many of our assets require significant work to bring them up to contemporary engineering standards for safe and reliable use.
- The operating environment for our Rural Assets has changed in recent years, requiring our assets to be available for much more of the year to support environmental water management.
- Increased regulatory requirements means that major maintenance works and renewals are more complex, time consuming and expensive than they used to be.
- Regulatory obligations arising from our works, such as the requirement to construct fish passages, mean that relatively inexpensive work can trigger disproportionately expensive compliance activities. Under current cost sharing arrangements, the vast majority of these costs are passed onto our customers.
- There is significant upwards pressure on the costs of doing business, as outlined in our proposal, which limits our customer's ability to pay for capital investments in infrastructure assets.

In response to these challenges, WaterNSW has developed a program which balances the need to invest in assets, with the need to minimise cost pressures. The key drivers of this program include:

- Replacement and renewals of aging infrastructure assets to enable continued provision of secure and reliable water delivery
- Upgrade of assets to meeting environmental regulations, such as fishways and cold water pollution
- Major projects such as the Warragamba dam resilience project and the Warragamba dam environmental flows (e-flows) project
- Compliance driven expenditure such as dam safety, electrical safety and crane safety programs.

2.2 Customer and community context

WaterNSW is one of the main government agencies tasked with managing water in NSW. We build, maintain and operate essential assets to provide the following main functions:

- Manage dams and protect the Greater Sydney drinking water catchment
- Supply water to customers, communities and the environment
- Service customers – from farmers to local councils – providing support for water licensing and approvals, trades and billing, to meet their water needs
- Own and operate the largest surface and groundwater monitoring network in the southern hemisphere

When developing our capital expenditure program for the five-year 2025 Determination period, we considered our customer feedback and strategic focus areas to be on these key areas:

- Keep local communities at front of mind as a community partner and advocate
- Operate flexibly and plan for future generations
- Enhance sustainable and healthy water systems and enable thriving communities
- Improve productivity and efficiency to keep costs as low as possible
- Invest in our assets to maintain and improve water delivery

- Meet compliance requirements - ensure we continue to meet the intent of existing and proposed new government and regulatory obligations
- Identify trends in customer behaviours, needs and expectations, with a focus on continuing to deliver liveability benefits to our customers
- Address climate change - ensuring our assets deliver climate resilient water supplies, minimise drought, flooding and bushfire risk that reduce our capability and capacity to deliver.

While we recognise that failing to appropriately invest in our assets in the short-term can have detrimental impact on our services in the long term, WaterNSW is also conscious of cost-of-living pressures. Consequently, we have actively sought to defer or reduce identified capital expenditure across the State as much as possible. In some cases, to defer or avoid works, we have sought to implement additional maintenance and monitoring programs as a trade-off. In other cases, we have taken the decision to accept more risk and continue to manage certain assets longer into their lifecycle.

The WaterNSW Capital Plan for the 2025 Determination period balances risk, cost, and performance now and in the future. The program has been developed with input from our customers and communities to ensure the proposed works align with their requirements and expectations.

2.3 Regulatory context

WaterNSW is a State-Owned Corporation established under the Water NSW Act 2014 and operates under an Operating Licence. Our activities are guided and regulated by a lot of significant pieces of legislation, including:

- WaterNSW Act 2014
- WaterNSW Regulation Act 2020
- Water Management Act 2000 and Water Act 1912 and Water Management (General) Regulation 2018
- Dams Safety Act 2015 and Dams Safety Regulation 2019
- Various other State and Commonwealth legislations

These are further described in Attachment 22.

In addition to legislative obligations, WaterNSW is also responsible for implementing elements of the NSW Government's various water strategies, such as the NSW Water Strategy, which involves restoring unimpeded fish passage to high priority weirs and addressing cold water pollution at priority dams.

WaterNSW's regulatory compliance obligations directly influence its operational costs and asset management strategies. By aligning investment decisions with applicable regulatory standards and obligations, WaterNSW allocates resources to maintain compliance, improve infrastructure resilience and enhance operational efficiency. By integrating the regulatory requirements into investment decision-making and incorporating them into the IPART pricing submission, WaterNSW can align its operational goals, asset management strategies, and financial objectives with the necessary compliance measures.

A significant portion of WaterNSW's FY26-30 capital expenditure is regulatory driven, including 5 of the top 10 projects which are listed in Table 1. An overview of the top 10 projects, including individual project summaries, are included in Attachment 7.

Table 1 – Compliance driven major projects

Project	Regulatory driver	FY26-30 expenditure
Warragamba Dam Resilience	Dams Safety Act 2015 and Dams Safety Regulation 2019	$609m
Warragamba E-Flows	Greater Sydney Water Strategy (August 2022) and Implementation Plan and Greater Metropolitan Region Unregulated River Water Sources 2023 Water Sharing Plan	$302m
Fishways	Fisheries Management Act 1994, NSW Fish Passage Strategy	$100.8m
Cold Water Pollution	NSW Water Strategy and water supply work approval conditions	$47m
Cataract Dam Safety Upgrade	Dams Safety Act 2015 and Dams Safety Regulation 2019	$36m

The programs of work in Table 2 are also primarily driven by the need to comply with regulatory requirements. When combined with the Major Projects in Table 1, these projects represent over $1b of regulatory driven capital investment, or ~60% of WaterNSW's forecast capital expenditure for FY26-30.

Table 2 – Other compliance driven capital expenditure

Project / program	Regulatory driver	FY26-30 expenditure
Dam safety projects, including 5 yearly comprehensive reviews and anchor testing	Dam Safety Act 2015	$57m
Torriganny Weir Upgrade & Fishway	Fisheries Management Act 1994	$15m[1]
Crane safety program	Manage OH&S risk associated with lifting equipment	$10m
Electrical safety program	Mitigate OH&S risk associated with electrical arc flash	$9m
Public safety projects	Mitigate risks to public safety at high exposure sites	$7m
Physical security upgrade projects	Security of Critical Infrastructure Act 2018, National Protective Security Policy Framework	$6m

[1]$15m represents the proportion of the project cost relating to the Fishway

3 Infrastructure Investment context

WaterNSW has developed a 30 year model to forecast when existing assets may require replacement based on their current age and asset condition. As noted in Section 2.1, WaterNSW has an ageing asset base and so contextualising short-term investment (5 years) with the longer term horizon (30 years) is an important consideration in determining a prudent level of investment. The model incorporates the estimated replacement cost of WaterNSW's infrastructure assets (per WaterNSW's 2019 insurance valuation report). This provides the necessary insights into longer term trends in capital investment requirements to inform asset management decisions.

The outputs of the model allows WaterNSW to anticipate future capex trends across its asset base, and analyse broad capex requirements between metropolitan and rural areas and across valleys and systems. WaterNSW uses these longer-term forecasts to optimise the timing of asset renewal, balancing asset risk and impacts on customer pricing through scenario assessment which is an integral part of the Pricing Submission development.

The following conclusions are evident from capital investment modelling, as shown in Figure 1 and Figure 2:

- A material increase in capital investment is needed in Rural Valleys over the medium-term (particularly until the late 2040s) (Figure 1). This demonstrates that a continuation of historic levels of investment are not sustainable without creating a significant challenge in future years.
- Higher levels of capital investment is needed in Greater Sydney than the long term average until the 2040s, then a reduction in capex into the 2050s and 2060s (Figure 2). Capital expenditure in the 2025 determination period is considerably higher than the long term average due to the impact of the Warragamba Dam Resilience and Warragamba E-flows projects (as can be seen in Figure 3 which removes these major projects).

In both cases the peaks shown in the model outputs are representative of the WaterNSW asset base which typically entails long-life assets that have a material renewal cost, thus creating the renewal profile demonstrated below.

Figure 1 – Long term capital investment projection for Rural Valleys (forecast average capex from 2026 to 2034 excludes construction of new fishway and cold water pollution assets)

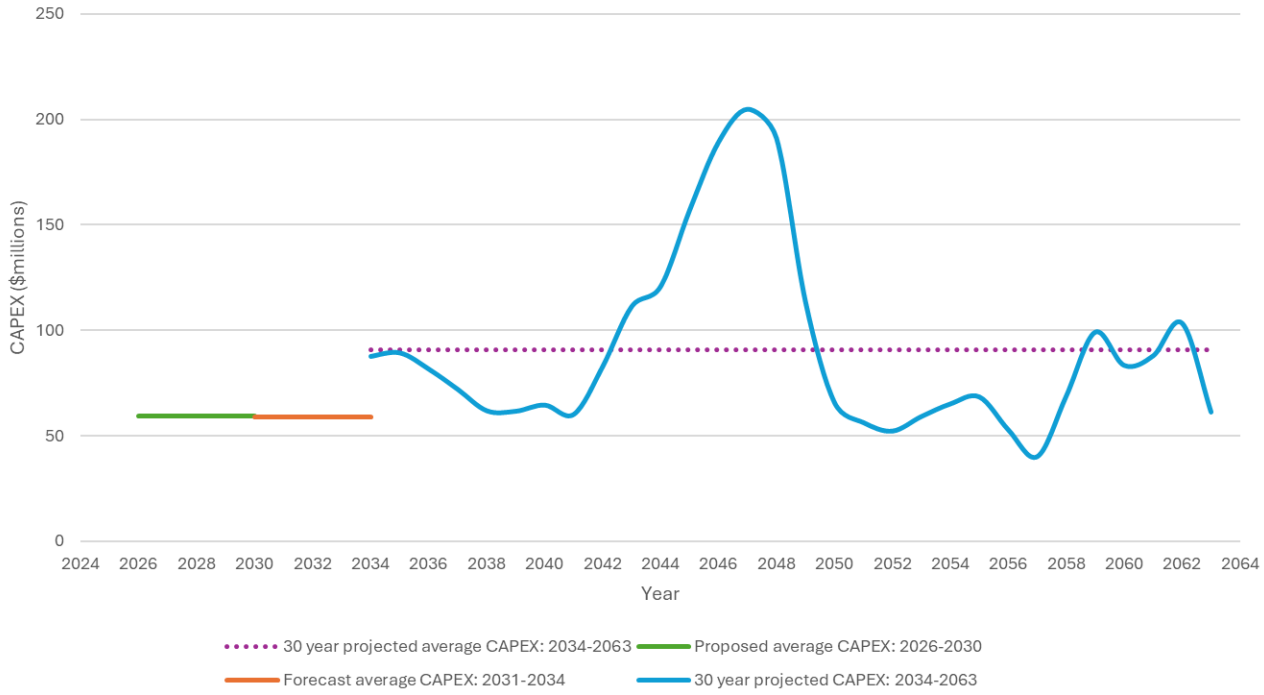


Figure 2 – Long term capital investment projection for Greater Sydney

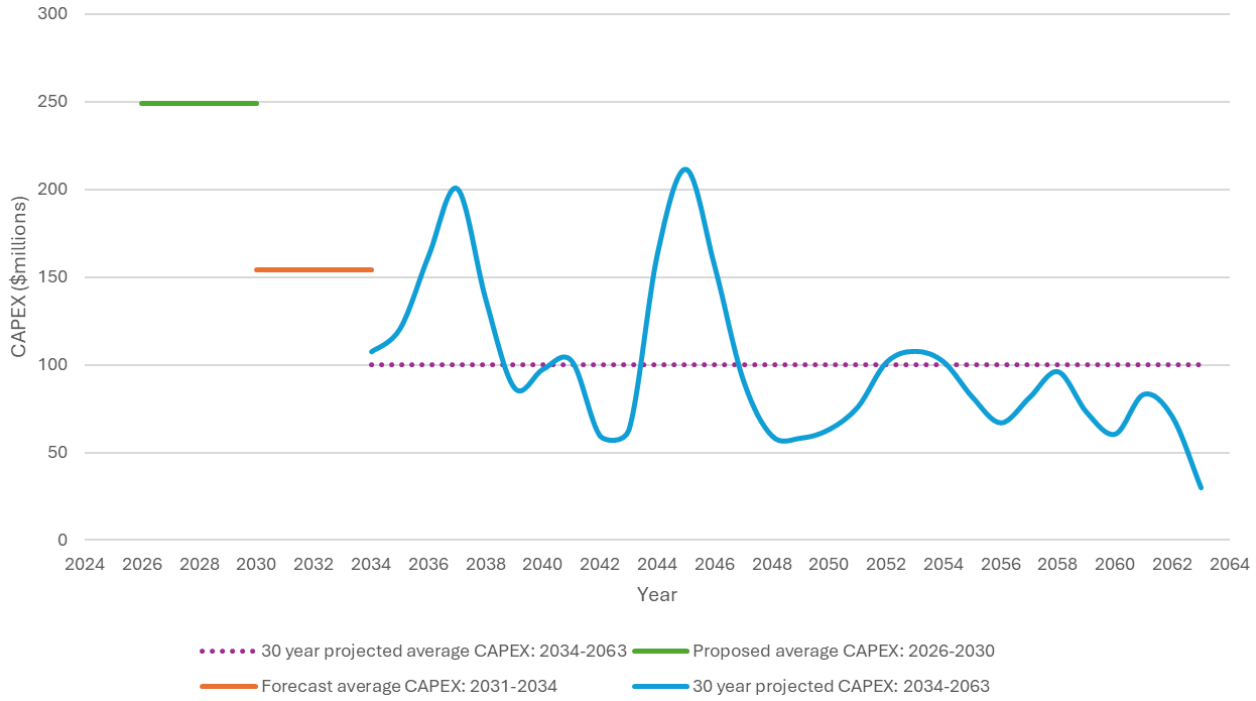
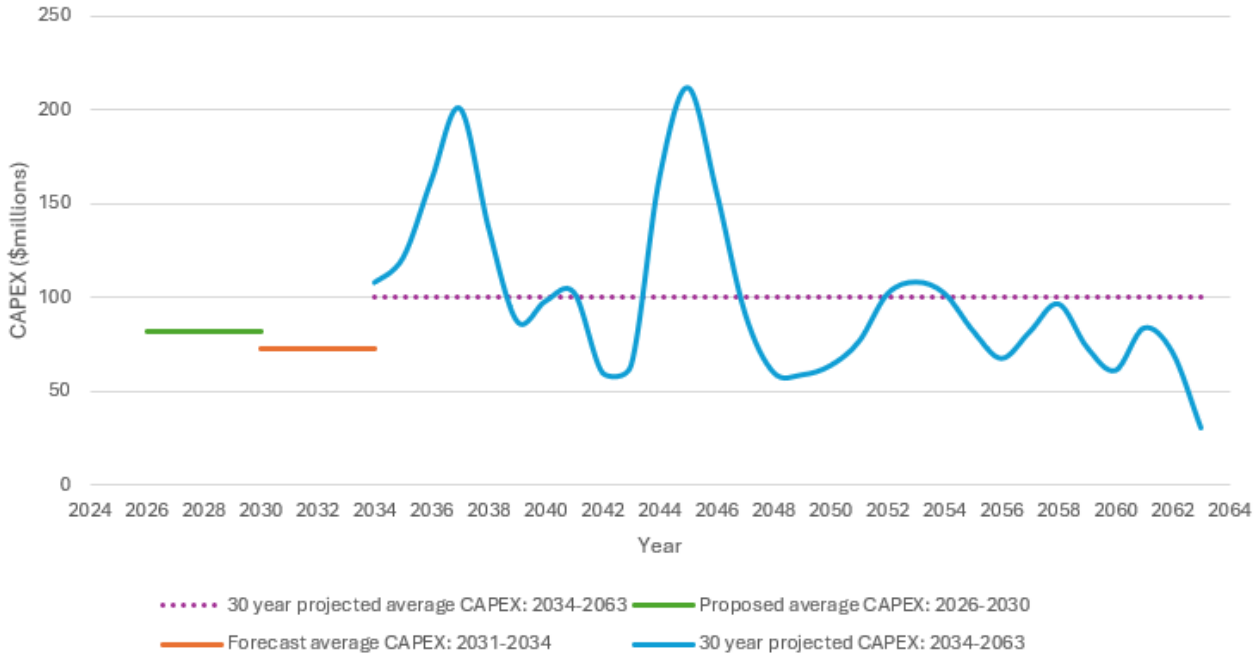


Figure 3 – Long term capital investment projection for Greater Sydney (excluding Warragamba Dam Resilience and Warragamba E-flows projects)



In preparing the capital program, more candidate projects were identified than could be delivered whilst adequately balancing impacts to pricing in the 2025 Determination period. WaterNSW consulted with its customers and modelled bill impact associated with varying levels of capital expenditure in each valley. This feedback helped guide WaterNSW's prioritisation process to establish a prudent level of capital investment in each valley. The prioritisation process provided a rigorous and structured process for selecting projects for delivery in the 2025 Determination period, and deferring projects for delivery in later determination periods.

The process of identifying, validating and prioritising projects is described in detail in Section 5. However, Figure 4 presents an example of how WaterNSW made informed decisions regarding the trade-off between capital investment needs, operational risk and customer affordability.

Figure 4 – Border cumulative cost versus cumulative benefit (avoided risk)

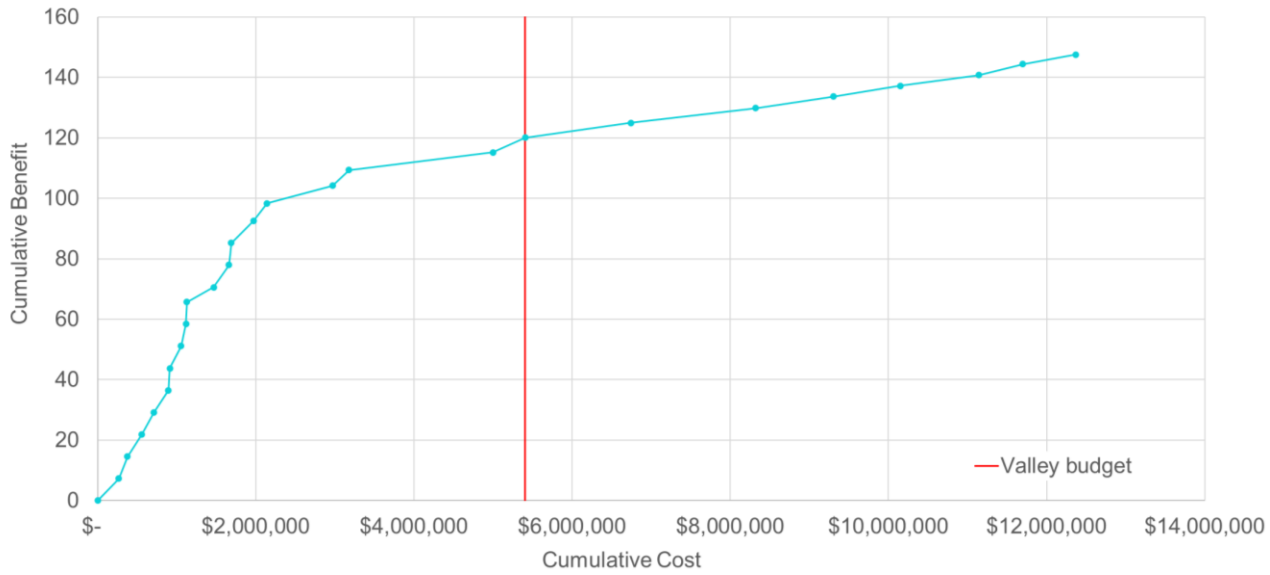


Figure 4 charts the assessed cumulative benefit in the Border valley (as an example) as capital expenditure is increased. In relation to the example output, it is noted that:

- The expected benefit (or avoided risk) of candidate projects were assessed by stakeholders
- Projects with the highest benefit (or avoided risk) relative to their capital cost have the highest "value score". Projects were ordered from highest to lowest based on the value score as part of the prioritisation process. The dots on the curve reflect the individual candidate projects.
- This results in the curve in Figure 4, where the gradient of the curve correlates to the value score. A steeper gradient indicates better value-for-money, while a flatter gradient represents diminishing value-for-money.

The vertical red line represents the level of expenditure WaterNSW deemed to be prudent for the 2025 Determination period, considering long term capex modelling, customer feedback, bill impact modelling and assessing that the risk of deferring specific projects can be satisfactorily managed by Operations.

It's important to note that while a flatter gradient indicates relatively lower value-for-money now, it is based on the current age and condition of the underlying assets. Therefore, asset renewal projects to the right of the chart will yield more benefit (or avoided risk) in the future as the underlying asset ages.

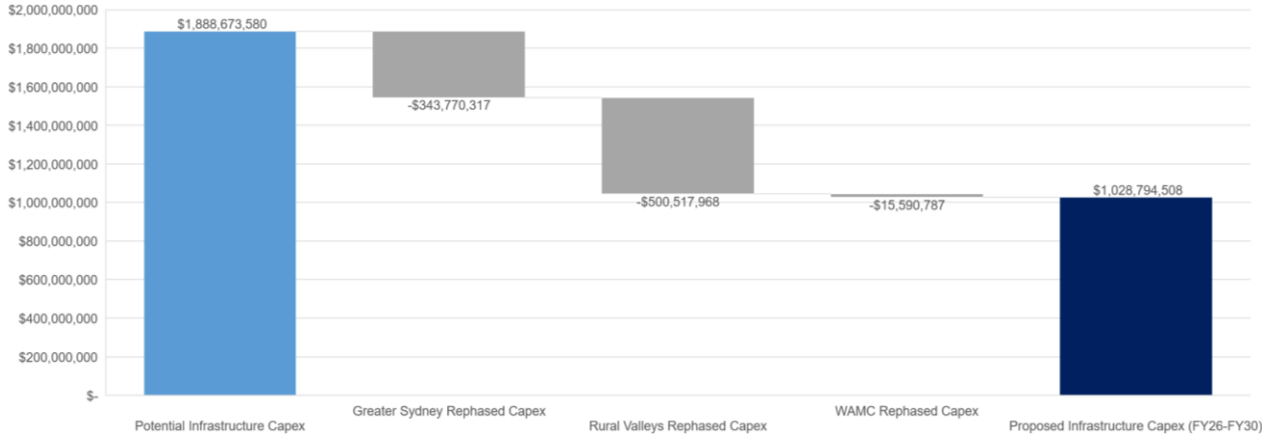
As shown in Figure 4, WaterNSW set forecast expenditure in the Border valley for the 2025 Determination period at approximately 40% of the total value of all identified candidate projects. The remaining 60% of identified project value will be deferred, with planning and design of specific higher priority projects to be progressed in FY26-30 as "substitution projects" in the event any planned projects are delayed, deferred or cancelled.

Across all of WaterNSW's systems and valleys, 46% of infrastructure capital investment has been deferred beyond FY30 as shown in the figure below:

- the resulting infrastructure spend proposed in FY26-30 is represented by the column on the far right (excluding Warragamba Dam Resilience ($609.1m) and Warragamba E-flows ($302m)).
- The deferred capital investment for Greater Sydney, Rural Valleys and WAMC are shown in the grey bars and totals $860m.

- The total potential investment that was assessed is therefore shown by the far left column at a value of $1,889m.

Figure 5 – Capital investment deferral (excluding Warragamba Dam Resilience and Warragamba E-flows)



To ensure that the proposed investment was balanced across the suite of asset classes deployed in WaterNSW asset fleet, Figure 6 (Greater Sydney), Figure 7 (Rural Valleys) and Figure 8 (WAMC) demonstrate how WaterNSW has balanced the decision of project deferral across all asset classes. The graphs show the total value of investment identified through candidate projects for each asset class, with the proposed investment value for FY26-30 shown in the dark blue and the value deferred to FY31+ in the grey.

Figure 6 – Greater Sydney capital expenditure by asset class (excluding Warragamba Dam Resilience and E-flows)

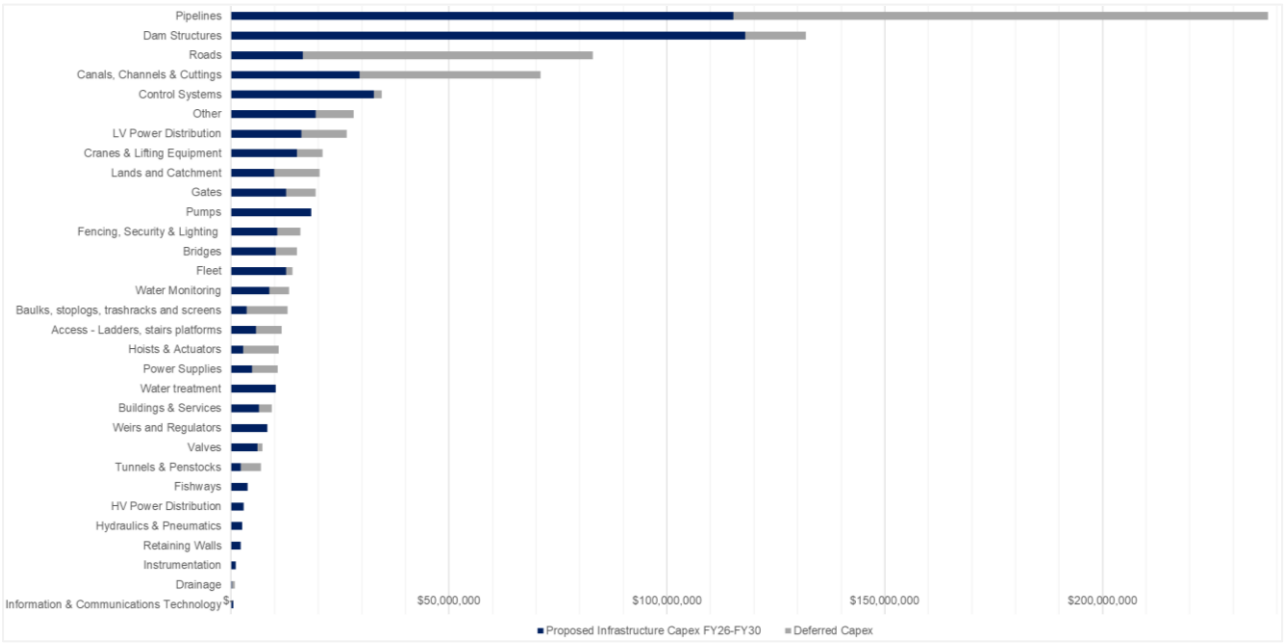


Figure 7 – Rural Valleys capital expenditure by asset class

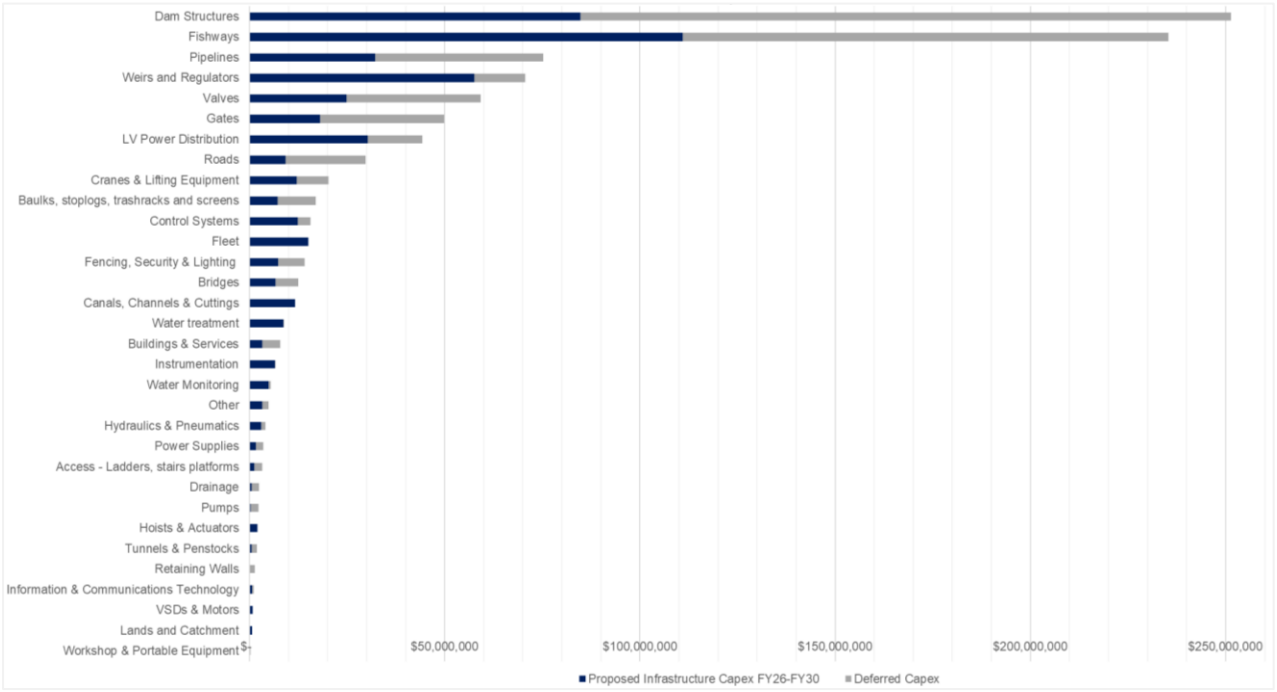
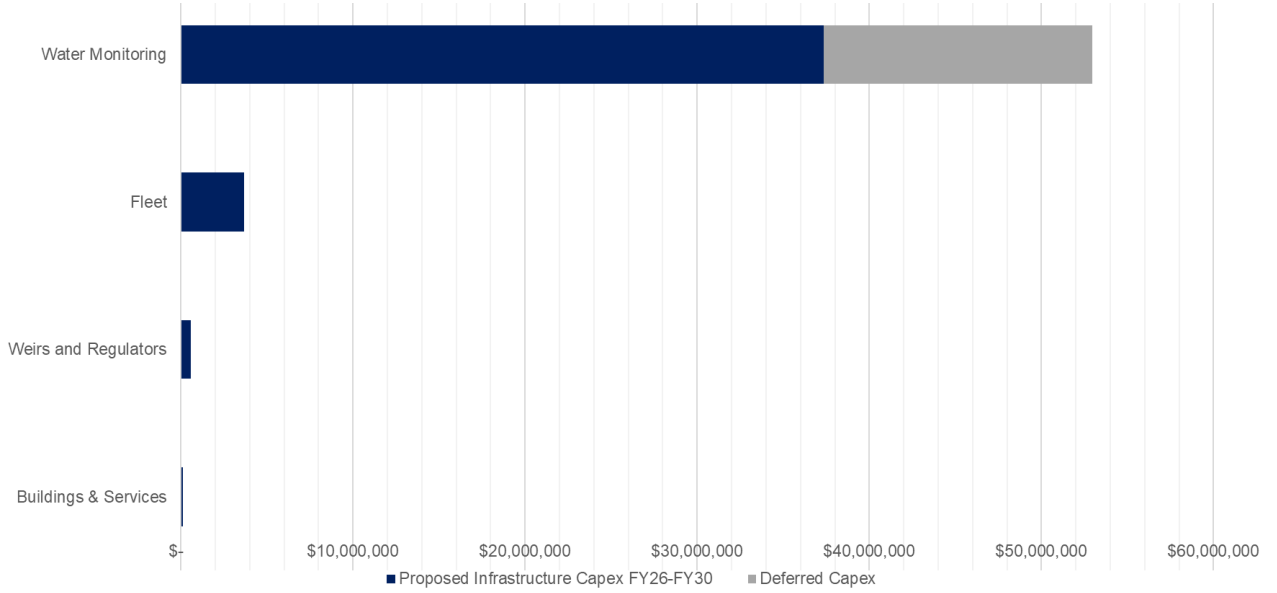


Figure 8 – WAMC capital expenditure by asset class

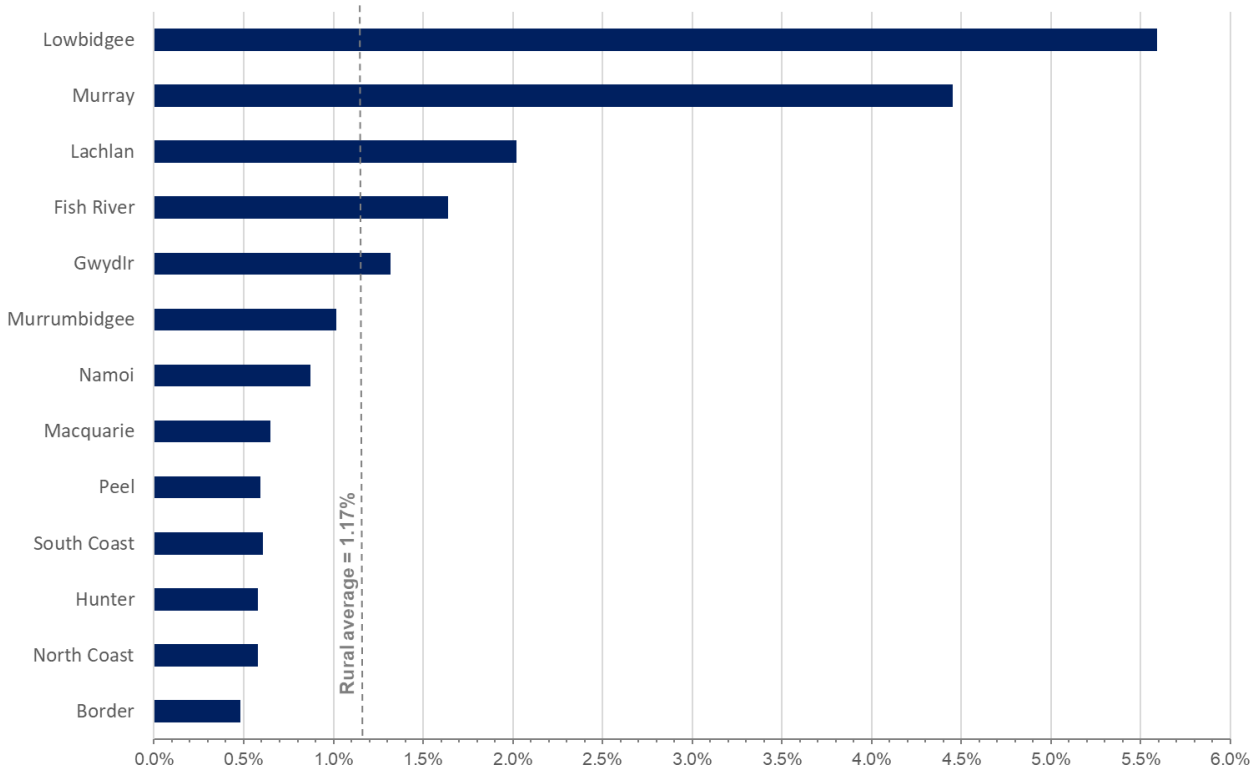


Noting the renewal profile as presented from the 30-year long-term model outputs and its variable nature driven by renewal of large and long-life assets, WaterNSW also assess the overall level of investment compared to total renewal value.

As shown in Figure 9, the majority of Valleys are proposed to have an investment level between 0.5% and 1.5% of their total asset value. On average this level of investment is 1.06% (excluding new assets such as Fishways and Cold Water pollution projects) across the portfolio of rural valleys. The variation in levels of investment indicates the variable nature of where assets are within their life-cycle across the different Valleys.

Lowbidgee's higher proportion is due to the very low assessed replacement value of its assets ($24m) relative to other Rural Valleys (which average $427m). Murray's higher proportion is due to inclusion of the $21.5m Pamamaroo Inlet Regulator Long Term Works, relative to the total Murray replacement value of $163m. Murray FY26-30 expenditure would be 1.8% of the asset replacement value without this large project.

Figure 9 – Annualised capex as a percentage of asset replacement value for Rural Valleys (excluding Fishway and Cold Water Pollution projects)

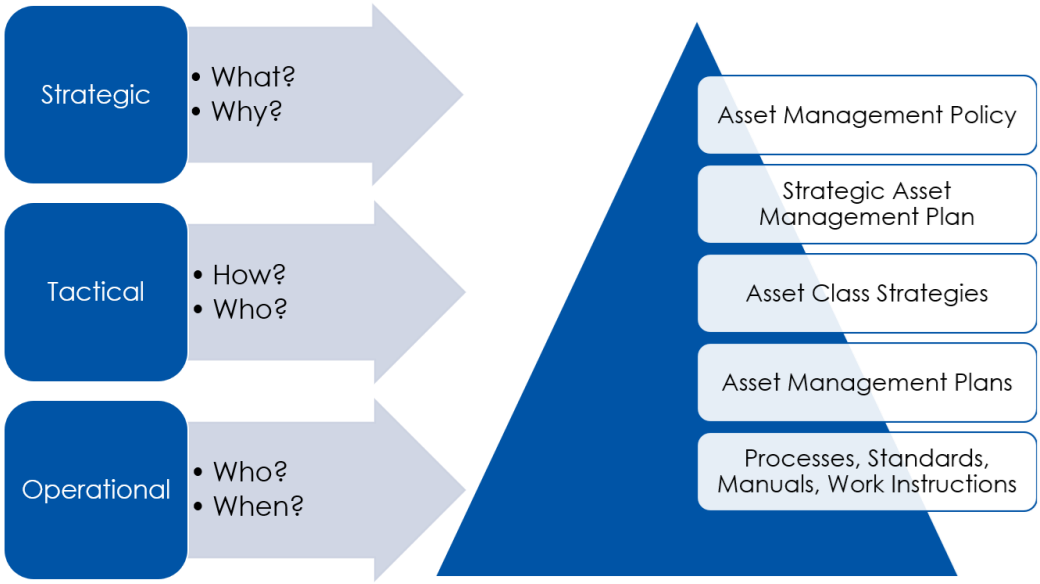


4 Asset management planning

4.1 Asset strategy

WaterNSW's Asset Strategy balances risk, cost, and performance to efficiently and prudently manage the assets in a manner consistent with the organisation's risk appetite and customer needs. The strategy is established and delivered through a hierarchy, shown in Figure 10 which ensures effective translation of strategy into operational action. Effective management of assets enables the delivery of water to customers.

Figure 10 – WaterNSW asset hierarchy



The Strategic Asset Management Plan (SAMP), Asset Class Strategies, and Asset Management Plans are of particular importance and their purpose is described below.

- **Strategic Asset Management Plan**: Establishes the overarching approach and governance required to manage WaterNSW's assets. The SAMP documents WaterNSW's risk tolerance, available asset management approaches, resources and expectations for service performance.
- **Asset Class Strategies:** Establishes the lifecycle strategy for assets within each asset class. The lifecycle strategy includes establishing rules for when/how assets are built, operated, maintained, renewed and decommissioned. Asset Class Strategies also establish the asset data necessary to manage each Asset Class.
- **Asset Management Plans:** Establishes the approach to managing a variety of assets within a defined hydrological valley such that customer service expectations can be met.

WaterNSW's asset lifecycle strategies vary by asset class, and within each asset class they vary based on an asset's criticality and risk of failure. Elements of lifecycle management employed by WaterNSW include:

- Assets which are required to be built to meet growth, compliance or other drivers are identified.
- Assets which are assessed as low risk, are generally replaced upon failure.
- Assets which are assessed as higher risk and criticality receive appropriate preventative maintenance and responsive maintenance to ensure their continued operation.
- Assets which are assessed as high risk and receive additional or more rigorous condition assessment reviews. To optimise total lifecycle cost and risk, assets may be proactively renewed such that they can continue to meet performance, safety, cost or other requirements.
- Assets which are deemed to be ineffective, and are unreasonable to renew, may be decommissioned.

WaterNSW determines what lifecycle strategy is applicable using the expert opinion of WaterNSW and independent Subject Matter Experts.

WaterNSW's asset strategies continue to evolve over time as Asset Management techniques/technology improves. Continuous improvement of WaterNSW's asset management strategy is an expectation under *ISO55000 Asset Management* to which WaterNSW is accredited.

4.2 Asset planning

The identification of when new assets are required to be built, and when existing assets are required for renewal is a key task of delivering WaterNSW's Asset Strategy. This function is identified as Asset Planning within WaterNSW.

WaterNSW's Asset Planning passes through a prioritisation process prior to a recommendation for expenditure on a new asset, or asset renewal. The prioritisation process, described further in Section 5.2, provides confidence that only projects that are absolutely necessary and provide adequate benefit are included in WaterNSW's pricing proposals.

Once projects are prioritised, investment programs are included within Asset Management Plans of each valley and discussed with customers. This approach ensures that the process of identifying projects and programs is rigorous, and there is transparency for customers regarding what/why certain actions are to be taken, and why some other actions will not be taken.

For the 2025 Determination period, WaterNSW has applied a rigorous approach to ensure projects contribute to balancing customer expectations, including feedback through the extensive customer engagement process undertaken by WaterNSW. Based on this feedback, where appropriate, WaterNSW has decided to defer works and extend the life of certain assets to manage customer price impacts. WaterNSW has also taken decisions to spread capital expenditure over multiple determination periods to reduce the price impact associated with meeting heightened requirements on asset security, drought operations risks, rising land management requirements, the State Water Strategy and some other Government initiatives.

WaterNSW considers it important to pursue ongoing improvement in Asset Planning functions within the business. Continuous Improvement initiatives include:

- Reviewing and improving the asset planning model (i.e. how projects and programs are triggered and documented by the business),
- Improving accuracy and reliability of asset data (to reduce the number of assets and systems with excessive risk)
- Improving governance of the asset planning function (to ensure that a healthy pipeline of proposed and justified projects is available at all times such that project prioritisation can be completed more regularly)

5. Capital program development

This section describes how WaterNSW identified and prioritised its capital investment requirements for the regulatory period and developed the scope of individual projects to inform expenditure forecasts and position the business for delivery of the capital program.

5.1 Project identification

WaterNSW identified candidate capital projects from a range of sources including:

- **Managing ageing assets**: WaterNSW maintains Asset Class Strategies for all major asset categories which identify the assets, their expected life, age profile, service levels, criticality and maintenance and renewal requirements. The Asset Class Strategies list any asset management requirements

driven by regulatory maintenance as well as applicable industry standards for managing the assets. Many asset renewal projects are identified through this formal asset management planning.

- **Compliance driven projects**: Up to 60% of the capital program is driven by compliance with specific regulatory requirements as discussed in Section 2.3 and Section 6.5.
- **Site specific requirements:** Operator recommendations for potential works based on their experience operating the assets is gathered through workshops. Regional operating risk assessments are also conducted, using the corporate risk template, which identify required mitigations.
- **Water supply needs and resilience**: Customer and community preferences and regulatory requirements driving system and environmental performance standards. Compliance with standards as informed by asset reliability data (e.g. service interruptions).
- **Dam Safety Compliance** – Capital investment activities in line with our Dam Safety Risk Management Framework to meet WaterNSW's regulatory and business requirements with the NSW Dams Safety Regulation 2019. This includes period-based capital projects; eg. 5-Yearly risk review, risk assessments and controls and post-tensioned anchors testing etc.
- **Security and safety**: Risks to the public, workers and asset security are reviewed to identify potential capital works to mitigate unacceptable risks. Compliance with applicable legislation such as Security of Critical Infrastructure Act 2018 is also assessed regularly to identify potential works.
- **Growth in network and customer connections**: Capital investment required to extend services to new areas, to existing properties or due to increasing density in existing areas.
- **Strategic planning**: Regional and metropolitan water strategies, drought strategies and Sydney Water's Long Term Capital and Operational Plan inform strategic decisions about the need for new or augmented infrastructure to meet the long term service needs within valleys or systems.
- **WaterNSW strategic corporate priorities**: Outcomes of workshop assessments of WaterNSW operational needs, challenges, and opportunities against the strategic corporate priorities.

WaterNSW identified a large number of potential capital projects required in the short, medium and longer term. The following sections explain how WaterNSW validated the business need for, and determined the relative priority of, the projects for inclusion in the 2025 Determination period submission.

5.2 Project prioritisation

Like any organisation, WaterNSW's investment choices must be prioritised. WaterNSW's Investment Prioritisation Framework is a robust process used by the organisation to support investment decisions by:

- **Being strategically aligned:** Having a framework that is strategically aligned to WaterNSW's corporate objectives can strengthen the justifications for prioritised investments to customer, shareholders, regulators and external stakeholders with transparency.
- **Increasing objectivity:** By having a structured approach across the organisation, WaterNSW applies an evidence-based decision-making process to prioritise investments. This results in a reduction of subjectivity and biases in evaluating investment opportunities.
- **Enabling trade-offs:** This structured approach will ensure that limited resources / available funding are directed towards projects that align to strategic objectives, customer priorities and ensure regulatory compliance.

The Operations Capital Project Prioritisation Procedure forms part of WaterNSW's Investment Prioritisation Framework. This procedure is applied to provide a structured and consistent process for prioritising identified capital investment. The process enables WaterNSW to direct funding to the highest priority projects and make

informed decisions about the prudent level of investment in each valley or system. WaterNSW's Operations Capital Project Prioritisation Procedure is summarised in Figure 11 and described in further detail in the following sections.

Figure 11 – WaterNSW Operations Capital Project Prioritisation Procedure

5.2.1 Stage 1: Validation

Validation applies screening checks and Go / No Go criteria to remove potential projects where there is an existing project underway to address the service need, works would be classified as opex or involve works on assets not currently or proposed to be a WaterNSW asset. This ensures projects undergoing prioritisation are considered valid capital projects.

5.2.2 Stage 2: Prioritisation

Validated projects are then evaluated individually to assess their expected benefits relative to their likely costs. For each project, Operations personnel use WaterNSW's Operations Prioritisation Tool to assign consensus benefit scores of None, Very Low, Low, Moderate, High or Extreme for each of the benefit criteria shown in Table 3. The benefit criteria align with WaterNSW's corporate strategic priorities as shown in the table.

Table 3 – Benefit criteria used in prioritisation process

WaterNSW corporate strategic priorities	Project benefits	
	Benefit criteria	Description
Building a sustainable future	Sustainable future	The project delivers environmental benefits
Respected by the customers and communities we serve	Customer & communities	The project delivers trust, good will and enhances WaterNSW social license to operate by providing transparency and water equity
Delivering operational excellence	Operational performance - Service Delivery	The project delivers financial savings, improvements to operational systems that reduce losses, or increases available water allocation.
	Operational performance - Safety	The project improves the safety of our people or the community
	Operational performance - Compliance	The project improves compliance with WaterNSW regulatory obligations and mitigates potential infringements or prosecutions
Developing our people and capabilities	People development	Investment in people that leads to an improvement in performance at the team and/or company level.
Working together in partnership	Stakeholder partnerships	System Improvements to support collaboration with stakeholders

Benefit Scores are allocated based on alignment with guidance criteria. As an example, the Operations Prioritisation Tool provides the following guidance on the quantum of benefits a project would be expected to generate to receive a Moderate score for **Operational Performance – Service Delivery benefit criteria.**

- The project resolves a moderate risk to delivery of an unacceptable outage to services, or the project will result in a modest incremental increase (approximately 1%) in services levels/ operational efficiencies for a large group of external customers.
- Examples of moderate benefits include: Estimated financial savings of $500,000/year, or improvements to operational systems enabling a 1-5% reduction in avoidable losses, or improvements that increase available water allocations to ~3GL for Rural Water or 300ML for Greater Sydney.

A project's total Benefit Score is divided by its estimated cost to generate a benefit to cost ratio (termed Value Score). The Value Score is not intended to indicate the economic viability of a project, its absolute value is used to generate a preliminary ranking of the highest to lowest priority projects within a valley or system.

5.2.3 Stage 3: Review

Preliminary prioritisation outputs provide stakeholders with an initial view of the relative priority and total valley/system expenditure associated with a range of investment scenarios, such as:

- 'We Don't Do It', 'We Do Something' versus 'We Do A Lot'.
- Impact of a high priority major project on proposed funding in a valley.

It also allows further review of the relative priority of certain projects as a validation step, allowing for adjustment of benefit scores if a project is ranked significantly higher or lower than would be logical.

This stage also enables the assessment of a prudent level of expenditure utilising the process described in Section 3. Providing WaterNSW management with the opportunity to understand various investment scenarios, potential pricing impacts and asset management impacts at an early stage of the process.

5.2.4 Stage 4: Update capital works program

In reviewing the overall Capital Works Program for infrastructure, WaterNSW may establish valley or system budgets at levels lower than Operation's proposed expenditure forecasts in order to manage impacts on customer prices, considering other business capital works programs. In these cases, the projects that will be selected based on the prioritisation process to determine which projects progress through WaterNSW's project lifecycle (refer to the Project Lifecycle as outlined in Assets – Project Management Framework (CD2021/164). This ensures that the organisation focuses on projects that can feasibly be delivered within the available financial envelope.

5.3 Options assessment and cost forecasts

As projects are validated and prioritised, WaterNSW commences development of projects that will form the capital works program. WaterNSW works with engineering partners and other specialist consultants to collect requirements from project stakeholders, confirm approval requirements and investigate technical solutions. The investigations enable cost estimates to be updated to a confidence level appropriate for a Preliminary Business Case. A Preliminary Business Case is developed for each project for consideration for Approval To Spend by WaterNSW's delegated authority.

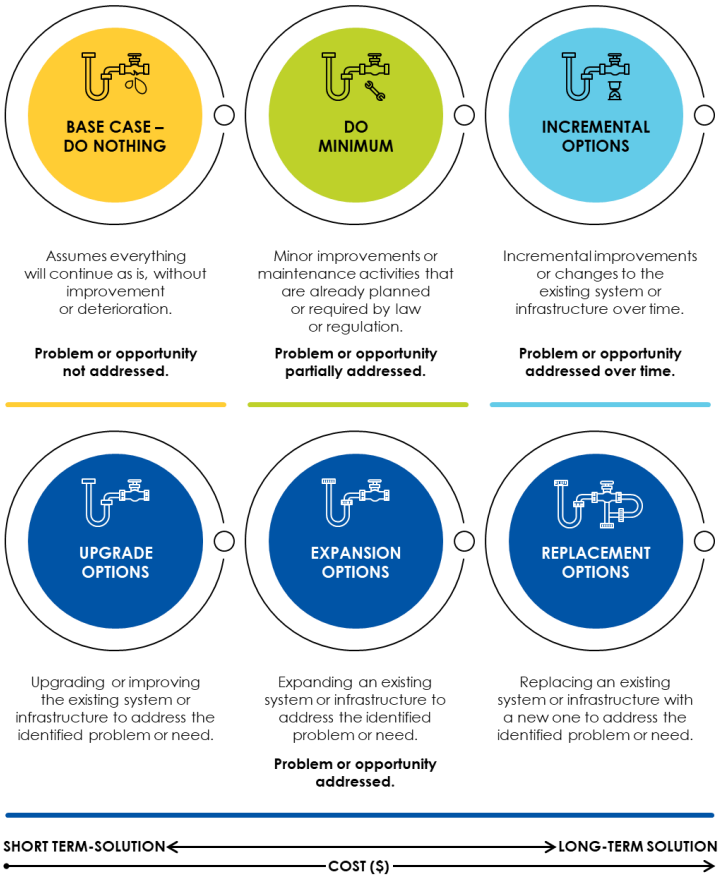
Projects are developed through the following phases of WaterNSW's project lifecycle:

- P0 Investigation
- P1 Initiation (where the PBC is produced)
- P2 Planning (where the FBC is produced)
- P3 Execution (construction phase)
- P4 Completion

In developing projects, WaterNSW uses the Options Assessment Guideline as a standardised methodology for developing, analysing, and evaluating different options for WaterNSW capital works projects. The guideline seeks to drive the most cost-effective solutions for generating the intended project benefits.

The guideline requires projects to be classified as basic or complex, and for complex projects, multiple options need to be developed and compared via multi-criteria analysis, lifecycle cost analysis or cost benefit analysis. Options include a do nothing base case and incrementally larger solutions for comparison as shown in Figure 12.

Figure 12 – Options Assessment Guideline



5.4 Alignment to customer outcomes

WaterNSW relied on customer feedback to drive the strategic focus for the 2026-2030 capital program. Our pricing proposal is focused on delivering on the outcomes that customers value. We are guided by six strategic, customer focused pillars that are embedded in our engagement and throughout our proposal. These six pillars, including how they interact with our corporate priorities, and how we have embedded them into our proposal, are summarised below. WaterNSW commits to:

1. **WaterNSW will provide secure and reliable water delivery** (aligned to our Delivery Operational Excellence corporate priority)
2. **WaterNSW will be efficient and keep its costs as low as practical** (aligned to our Delivery Operational Excellence corporate priority)
3. **WaterNSW will provide easy customer and community access to data and information** (aligned to our Respected by the Customers and Communities we Serve corporate priority)
4. **WaterNSW will provide good customer experiences (enabling our customers to run their businesses)** (aligned to our Respected by the Customers and Communities we Serve corporate priority)
5. **Sustainable water and land management** (aligned to our Building a Sustainable Future corporate priority)

6. **WaterNSW will be open and transparent (about customer charges and WaterNSW expenditure)** (aligned to our Working Together in Partnership corporate priority)

5.5 Program efficiencies

Consistent with our commitment to provide improved value to our customers, WaterNSW has a range of measures to improve the efficiency of capital projects delivered. WaterNSW expects to generate efficiencies when delivering the capital program through:

1. Robust needs and options assessment, ensuring that non-capital solutions are considered;
2. Value engineering during design development;
3. Procurement efficiencies through intelligent project packaging that may enhance competition or generate economies of scale or geographic synergies for construction contractors; and
4. WaterNSW project management efficiencies via allocation of low complexity projects to Regional Delivery teams.

These efficiencies are expected to reduce costs across the program generally. Accordingly, cost estimates for new candidate projects and fishway projects, for FY26-30, were reduced by the following efficiency factors to reflect these program-level efficiency opportunities.

- 2.5% for small rural valleys, being those with FY26-30 capital expenditure <$5m (Border, Lowbidgee, North Coast, Peel, South Coast).
- 3.0% for large rural valleys, being those with FY26-30 capital expenditure >$5m (Fish River, Gwydir, Hunter, Lachlan, Macquarie, Murray, Murrumbidgee, Namoi).
- 4.0% for Greater Sydney.

Efficiency factors were applied prior to application of corporate overheads. Efficiency factors were not applied to existing active projects, fleet purchases, plant & equipment purchases and cold water pollution planning projects as value engineering and other program-level efficiencies were limited.

Forecast expenditure reduced by $15.7m due to anticipated program efficiencies. Expenditure reduced by $8.5m, $7.2m and $16k in Greater Sydney, Rural Valleys and WAMC respectively.

6. Proposed infrastructure capital program

Infrastructure capital expenditure of **$1,939.7m** is proposed for the period as shown in **Table 4**, **Figure 13** and **Figure 14** below (excluding third-party funded works).

Table 4 – WaterNSW infrastructure capital expenditure for the 2025 Determination period ($m)

Determination	2025-26	2026-27	2027-28	2028-29	2029-30	Total FY26-30
Greater Sydney	$143.7	$284.0	$358.2	$360.3	$273.6	**$1,419.8**
Rural Valleys	$87.4	$143.4	$123.3	$71.4	$52.7	**$478.2**
WAMC	$8.4	$8.4	$8.4	$8.4	$8.6	**$41.7**
Total	**$239.6**	**$435.7**	**$489.8**	**$440.1**	**$334.4**	**$1,939.7**

Figure 13 – WaterNSW capital expenditure for the 2025 Determination period

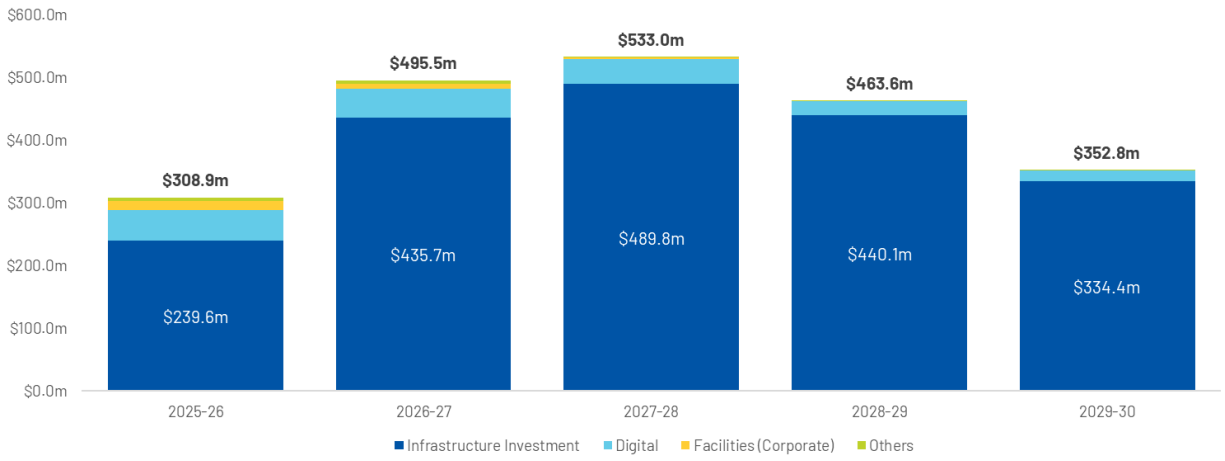
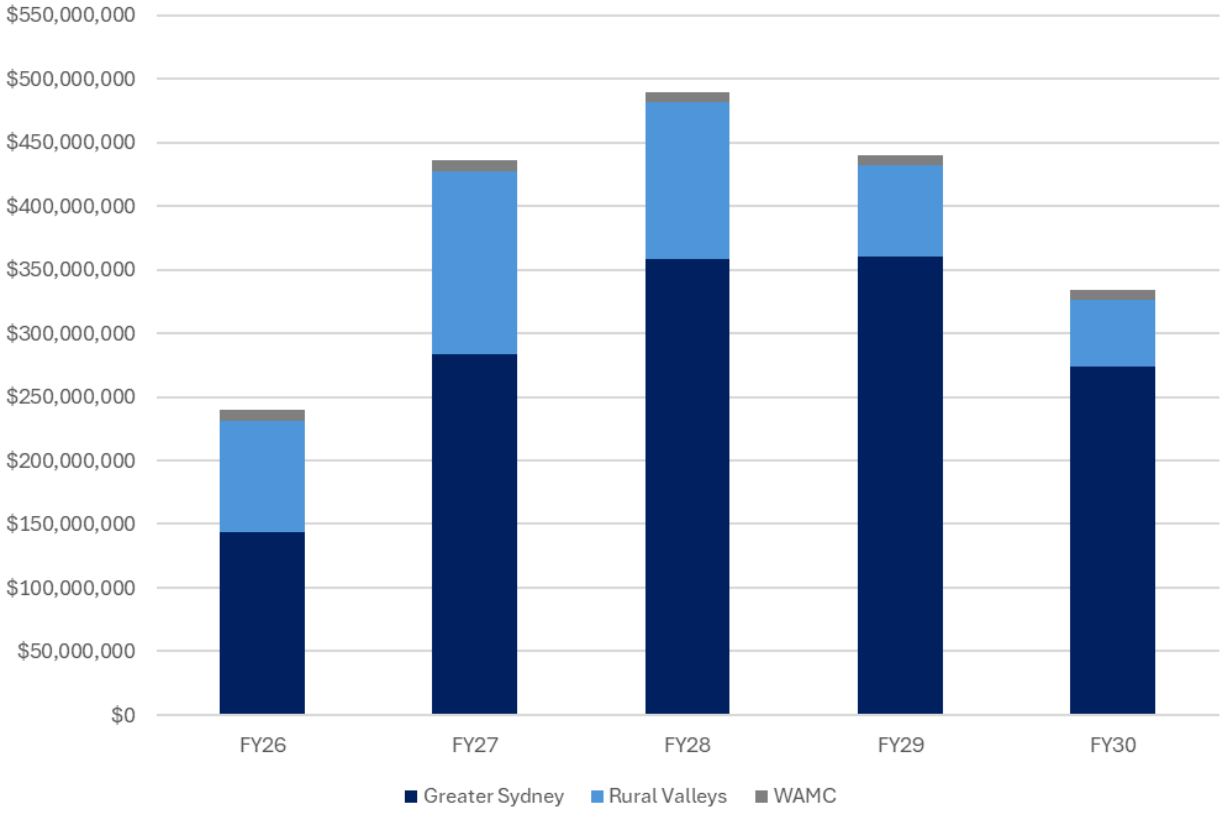


Figure 14 – WaterNSW infrastructure capital expenditure for the 2025 Determination period



The following sections provide a breakdown of capital expenditure by determination, including a summary of key drivers of capital investment. Detailed explanation of capital expenditure in individual valleys and systems are included in the valley-based Investment Business Cases.

6.1 Renewal and Replacement Investment is Proposed to Increase

WaterNSW has proposed a significant increase in renewals investments in the FY26-FY30 period. In the first instance this needs to be contextualised with how our proposed investment compares to modelled investment needs (shown in Figure **3** and Figure **1**). WaterNSW's proposed investment for both Greater Sydney and Rural Valleys is proportionate with the asset base being maintained on behalf of our customers, community, and shareholders. Proposed investments were developed utilising Asset Management Planning Processes as described in Sections 4 and 5 above. Please see sections 6.2.1 and 6.3.1 for drivers of Greater Sydney and Rural Valleys investment respectively.

6.2 Greater Sydney

Forecast capital expenditure over the 2025 Determination period for Greater Sydney is **$1,419 million**. Table 5 shows how this investment is spread across individual systems. The proposed expenditure in Warragamba is significantly higher than other systems due to this system having the three largest projects in the 2025 Determination period**.**

Table 5 – Greater Sydney capital expenditure by system ($m)

System	2025-26	2026-27	2027-28	2028-29	2029-30	Total FY26-30
Greater Sydney "All Systems"	$17.5	$13.3	$12.6	$11.4	$10.2	$65.0
Blue Mountains	$5.5	$11.6	$14.1	$6.9	$1.5	$39.5
Shoalhaven System	$13.7	$13.3	$11.1	$8.2	$9.2	$55.5
Upper Nepean	$31.0	$45.1	$35.0	$22.6	$14.8	$148.5
Warragamba	$76.1	$200.6	$285.3	$311.2	$237.8	$1,111.1
Total	**$143.7**	**$284.0**	**$358.2**	**$360.3**	**$273.6**	**$1,419.8**

Table 6 shows the proposed capital expenditure in Greater Sydney by activity.

- Dam Safety Compliance contributes to approximately 48% of the total investment in Greater Sydney. This reflects the major investment proposed for Warragamba.
- Renewal and Replacement activities contribute to approximately 27% of the total investment in Greater Sydney. This investment is necessary to ensure existing assets are able to perform as required to deliver the expected level of service and appropriately manage risk.
- Structural and Other enhancements contribute to approximately 21% of the total investment in Greater Sydney. This is primarily due to the structural enhancements required to provide variable Environmental Flows from Warragamba.

Table 6 – Greater Sydney capital expenditure by activity ($m)

Activity	Total FY26-30
Dam safety compliance	$683.9
Renewal and replacement	$388.5
Structural & other enhancements	$301.8
Asset management planning	$17.2

Land, Buildings and Roads Management	$11.3
Hydrometric monitoring	$7.7
Catchment Planning and Operations	$6.5
Water quality monitoring	$1.1
Water delivery and other operations	$0.8
Environmental planning and protection	$0.5
Flood Operations	$0.4
Internal	$0.1
Total	**$1,419.8m**

As illustrated in Table 7, dam structures is the asset class with the largest investment, representing 72% of the Greater Sydney capital expenditure program ($1,419m) with Warragamba Dam Resilience and Warragamba E-Flows projects contributing 64% of this total. Pipelines attract the next largest investment which is largely renewal and replacement of assets such as:

- Warragamba Pipeline & Corridor Works
- Warragamba Pipeline Ancillary Valves Upgrade
- Kangaroo Pipeline Renewals

Table 7 – Greater Sydney capital expenditure by asset class ($m)

Asset Class	Total FY26-30
Dam Structures	$1,029
Pipelines	$115
Control Systems	$33
Canals, Channels & Cuttings	$29
Unallocated	$19
Pumps	$18
LV Power Distribution	$16
Roads	$16
Cranes & Lifting Equipment	$15
Gates	$13
Fleet	$13
Fencing, Security & Lighting	$11
Bridges	$10
Water treatment	$10
Land and Catchment	$10
Water Monitoring	$9
Weirs and Regulators	$8
Buildings & Services	$6
Valves	$6

Asset Class	Total FY26-30
Access - Ladders, stairs platforms	$6
Power Supplies	$5
Fishways	$4
Baulks, stoplogs, trashracks and screens	$4
HV Power Distribution	$3
Hoists & Actuators	$3
Hydraulics & Pneumatics	$3
Tunnels & Penstocks	$2
Retaining Walls	$2
Instrumentation	$1
Information & Communications Technology	0.5
Drainage	0.2
Total	**$1,419.8m**

6.2.1 Greater Sydney – Renewal and Replacement Investments

Our Greater Sydney Assets are critical for the supply safe and reliable drinking water to 5 million customers in Sydney, the Blue Mountains and the Illawarra.

We have identified increased investments are needed across the Greater Sydney infrastructure portfolio to ensure our assets can continue to provide a suitable level of service, whilst keeping longer term life cycle costs at a suitable level. We have identified the need to increase our investments across several asset classes, including pipelines, control systems, and pumping stations. These increases are based upon sound Asset Management principles, according to our processes. The example of the Warragamba Pipelines below typifies the approach we have undertaken.

Greater Sydney Renewals Example – Warragamba Pipelines

WaterNSW operates several large and highly critical pipelines in the Greater Sydney operating region. The most critical of these are the twin pipelines which convey water from Warragamba Dam to Prospect and Orchard Hills Treatment Plants, which are responsible for supplying the majority of Sydney Water Customers. We have done a lot of work to better understand the condition of the pipeline as well as drawing on sound benchmark cost data. This has resulted in the need to increase the level of investment to manage risks to supply to an acceptable level. Notwithstanding the criticality of this asset we have still elected to defer $113.3m of identified works past FY2030 as shown in Figure 6.

6.3 Rural Valleys

Forecast capital expenditure over the 2025 Determination period for Rural Valleys is **$478.2m**. Table 8 provides a breakdown of this investment per valley.

Table 8 – Rural Valleys capital expenditure ($m)

Valley	2025-26	2026-27	2027-28	2028-29	2029-30	Total FY26-30
All Valleys	$1.0	$1.0	$1.0	$1.0	$0.6	$4.5
Border	$0.4	$2.1	$1.8	$0.5	$0.5	$5.4
Fish River	$2.3	$2.7	$4.4	$10.8	$25.2	$45.4
Gwydir	$12.7	$13.5	$24.0	$18.7	$3.1	$72.0
Hunter	$8.0	$7.7	$3.3	$2.1	$1.3	$22.4
Lachlan	$26.7	$35.2	$20.5	$5.7	$4.7	$92.8
Lowbidgee	$0.9	$1.2	$3.3	$1.2	$0.2	$6.8
Macquarie	$15.6	$27.6	$24.7	$5.6	$3.0	$76.5
Murray	$6.7	$21.2	$3.0	$3.0	$2.4	$36.3
Murrumbidgee	$6.8	$12.3	$10.7	$17.1	$7.2	$54.2
Namoi	$4.1	$16.7	$24.9	$4.5	$3.7	$53.8
North Coast	$0.4	$0.4	$0.6	$0.3	$0.2	$2.0
Peel	$1.6	$1.2	$0.4	$0.5	$0.2	$4.0
South Coast	$0.2	$0.5	$0.8	$0.3	$0.3	$2.1
Total	**$87.4**	**$143.4**	**$123.3**	**$71.4**	**$52.7**	**$478.2**

Table 9 shows the proposed capital expenditure in Rural Valleys categorised by activity. The table shows:

- Renewal and replacement activity represents approximately 52% of the total investment across rural valleys. The focus of this activity is to maintain service levels to our customers within an acceptable level of business risk.
- Environmental Planning and Protection activities represent approximately 31% of total investment across rural valleys. This is primarily inclusive of Fishways planning and/or construction activities and cold water pollution projects.

Table 9 – Rural valleys capital expenditure by activity ($m)

Activity	Total FY26-30
Renewal and Replacement	$250.1
Environmental Planning and Protection	$147.6
Dam Safety Compliance	$50.2
Water Delivery and Other Operations	$19.9
Land, Buildings and Roads Management	$4.3
Asset Management Planning	$3.2
Drought Operations	$2.0
Internal	$0.8
Total	**$478.2**

Table 10 shows that Fishways is the asset class with the largest investment, representing 23% of the Rural Valleys capital expenditure program ($478.2m). Dam structures attracts the next largest investment at 18% of the Rural Valleys capital expenditure program.

Table 10 – Rural Valleys capital expenditure by asset class ($m)

Activity	Total FY26-30
Fishways	$110.9
Dam Structures	$84.7
Weirs and Regulators	$57.6
Pipelines	$32.2
LV Power Distribution	$30.3
Valves	$24.8
Gates	$18.0
Fleet	$15.1
Control Systems	$12.3
Cranes & Lifting Equipment	$12.1
Canals, Channels & Cuttings	$11.7
Roads	$9.2
Water Treatment	$8.7
Fencing, Security & Lighting	$7.4
Baulks, stoplogs, trashracks and screens	$7.1
Bridges	$6.6
Instrumentation	$6.5
Water Monitoring	$4.8
Buildings & Services	$3.3
Unallocated	$3.2
Hydraulics & Pneumatics	$3.0
Hoists & Actuators	$2.0
Power Supplies	$1.6
Access - Ladders, stairs platforms	$1.2
VSDs and Motors	$0.8
Information & Communications Technology	$0.7
Land and Catchment	$0.7
Tunnels & Penstocks	$0.5
Drainage	$0.5
Pumps	$0.3
Retaining Walls	$0.1
Total	**$478.2**

6.3.1 Rural Valleys – Renewal and Replacement Investments

WaterNSW operates a large regional asset portfolio for our regulated valleys. The services that these assets provide are crucial for the customers and communities we serve. As discussed in section 3, historic rates of expenditure have been disproportionately low, given the size of our regional asset base. In developing our submission we identified significant investment requirements, including low voltage power distribution, pipelines, and valves. These investments are required to ensure that our assets continue to operate effectively and reliably in the medium to long term. Some key examples are referenced below.

Toriganny Weir Upgrade and Fishway

Commissioned in the 1960's, Torriganny Weir is an on-river structure located within Torriganny Creek, about 14km North of Booligal. The weir is currently in poor condition, and an operational and public WHS intolerable risk. One of the main purposes of the Torriganny weir is to deliver annual stock and domestic replenishment flows to landholders in Merrimajeel and Muggabah Creeks.

We need to replace the weir to ensure that we are able to continue to meet our levels of service obligations, which is expected to trigger the requirement for a fishway to be constructed. This represents the first time in recent history, that a significant on river structure is being replaced, including fishway construction, utilising predominantly customer RAB funding.

Fish River Pipeline Renewals

The Fish River Supply Scheme comprises of 236km of pipeline, a significant proportion of which was constructed in the decades immediately following World War 2. WaterNSW have been experiencing very frequent failures, resulting in significant concerns being expressed by our customers, as well as being a key focus for IPART, our pricing and operating license regulator.

We have undertaken a strategic review of the scheme, and identified a 7.2km section of reinforced concrete main for immediate replacement, at an estimated cost of $59.1m, which would result in a measurable improvement in service performance. This investment has been phased over the next two determinations to reduce impacts on customer bills. This represents a considerable increase relative to historically low renewals investments in the Fish River Scheme.

6.4 WAMC

Water Administration Ministerial Council (WAMC) comprises WaterNSW, Natural Resource Access Regulator and the Department of Planning and Environment, each with their own defined roles and water monitoring responsibilities across New South Wales. A Roles and Responsibilities Agreement was executed in June 2021 which specifies responsibilities assigned to each entity, including defining the services that WaterNSW must deliver for groundwater, surface water and water quality monitoring. In summary, WaterNSW is responsible for:

- Performing routine, corrective and preventative maintenance on water monitoring assets
- Collecting all required information (sampling) from the water monitoring assets
- Storing the collected data
- Providing the data to relevant parties (NRAR, MDBA, Community) as directed by DPE
- Alerts and notifications as warranted by the collected data

Forecast capital expenditure over the 2025 Determination period for WAMC is **$41.7 million**.

Table 11 shows the WAMC infrastructure capital expenditure items included in the FY26-30 IPART submission.

Table 11 – WAMC infrastructure capital expenditure

Project	Project description	Project Cost ($m)
Hydrometric Surface Water Renewals Program	Condition based renewal of hydrometric surface water assets	$20.17
Hydrometric Ground Water Renewals Program	Condition based renewal of hydrometric ground water assets	$4.97
Water Monitoring Asset Renewals Program – Ground Water	The main metric used to assess bore condition for potential renewal works is the depth to the bottom of the bore – i.e. the current silt/mud layer, in relation to the depth of the screened section which links the bore to the aquifer. 3172 of approximately 4500 bore pipes have been inspected to date. Results indicate: • 16% of bores inspected are completed blocked • 20% of bores inspected are partially blocked • 64% are not blocked (still fit for purpose)	$12.2
Unregulated Weirs Public Safety Works	Periodic minor public safety works at unregulated weirs	$0.58
Fleet LV Replacement	Replacement of light vehicles	$3.57
All Determinations Allocation	Hazardous Building Materials Surveys Operations Performance & Support team - Fleet (LV new) IVMS Use Hardware and installation	$0.22
	Total	**$41.7**

6.5 Compliance driven works

As previously discussed in Section 2.3, a significant portion of WaterNSW's FY26-30 capital expenditure is driven by regulatory compliance obligations, including 5 of the top 10 projects. The key compliance related activity relates to the following categories.

6.5.1 Dam safety projects

WaterNSW has undertaken a major review of its dam safety risk assessment and prioritisation approaches in order to align future investment with a new regulatory framework, which includes introduction of the Dams Safety Act 2015 (NSW), Dams Safety Regulation 2019 (NSW) and supporting methodologies for risk rating released by Dams Safety NSW in 2022.

This review included development of the So Far As Is Reasonably Practicable (SFAIRP) framework for identifying risk control measures required under the SFAIRP principle. WaterNSW is in the process of identifying the risk control measures required to reduce dam safety risks to meet the SFAIRP principle.

WaterNSW has developed a Dam Safety Investment Strategy to economically assess a suite of investment strategy options to meet SFAIRP requirements. The strategy includes annual caps on confirmatory investigations and construction in order to manage impacts on customer pricing. The strategy informed the prioritisation of 349 risk control measures currently identified by WaterNSW.

WaterNSW estimated the cost of these projects and prioritised them for implementation between 2024 and 2052, while keeping expenditure within the annual caps in the strategy. WaterNSW also developed cost estimates for 5 yearly dam safety inspections.

Total FY26-30 expenditure to implement dam safety SFAIRP risk control measures, anchor testing and 5 yearly Comprehensive Reviews and Operational Preparedness Testing for dams is $38.4m in Greater Sydney and $18.5m in Rural Valleys.

6.5.2 Environmental

WaterNSW is required to deliver substantial infrastructure works in the 2025 determination period to implement NSW Government strategies to improve environmental outcomes and comply with relevant environmental legislation.

The NSW Government's NSW Water Strategy (2021) is a key driver of these environmental infrastructure works, as it includes the following initiatives to address threats to native fish:

- Implementation of the NSW Fish Passage Strategy.
- Address cold water pollution at priority dams where cold water impacts are severe.
- Invest in fish-friendly water extraction technology at priority sites.

These initiatives are then further articulated in more detail within the respective valley-specific Regional Water Strategies and associated Implementation Plans where they are available.

Fishways

Barriers to fish passage along waterways inhibit migration and breeding of native fish species and can have severe implications on their populations. The NSW Fish Passage Strategy is a 20-year plan to restore unimpeded fish passage to 165 high priority weirs.

WaterNSW manages a rolling program of fishway projects to ensure fish passage is incorporated into river structures where this requirement is triggered under the NSW Fisheries Management Act 1994. Table 12 lists the fishway projects to be designed or constructed in the 2025 determination period as part of the NSW Fish Passage Strategy. Note that in addition to the Dam Safety Upgrade offset sites listed below, Fishway Construction is a significant component of the Torriganny Weir Upgrade and Fishway project.

Table 12 – Fishway infrastructure capital ($m)

Valley	Fishway Project	Phase	Total FY26-30
Gwydir	Boolooroo Weir Fishway	Design	$1.8
Gwydir	Tareelaroi Weir Fishway	Design	$2.0
Gwydir	Tyreel Weir Fishway	Design & Construction	$9.7
Gwydir	Tyreel Regulator Fishway	Construction	$11.6
Lachlan	Booberoi Weir Fishway	Design	$1.8
Lachlan	Lake Brewster Diversion Weir Fishway	Design	$1.9
Lachlan	Lake Cargelligo Inlet Regulator Fishway	Construction	$24.2
Macquarie	Dubbo North Weir Fishway	Design	$1.7
Macquarie	Gin Gin Weir Fishway	Design	$1.8
Macquarie	Marebone Break Regulator Fishway	Construction	$12.3
Namoi	Gunidgera Weir Fishway	Construction	$32.3
			Total: $100.8

Cold Water Pollution

Since European settlement, native fish numbers have declined by over 90%, with Cold Water Pollution (CWP) listed as a key contributor to this decline. CWP occurs downstream of many large dams in NSW due to the

release of cold water derived from deep within the reservoir. The release of cold water suppresses downstream water temperatures by as much as 10°C - 17°C during warmer months which, in turn, causes pervasive ecological, social, and cultural impacts to over 2,000 km of mainstem rivers in NSW.

In response, the interagency members of the NSW CWP Working Group have developed an updated draft CWP Strategy. DPI Fisheries is the lead agency of the Working Group and WaterNSW is the key member as an Asset Owner Operator of large dams in NSW. Phase 1 of the Strategy (2023 – 2030) includes the development of concept and detailed designs for CWP mitigation at three high priority dams (Blowering, Copeton and Keepit) as per requirements outlined within the respective Works Approvals issued under the Water Management Act 2000. Phase 1 also identifies the completion of a revised detailed cost-benefit analysis (CBA) to capture improved cost and benefit values by June 2028 that will inform the development of a business case for Phase 2 activities.

WaterNSW is presently completing the CWP mitigation option studies for Copeton, Keepit, and Blowering Dams, which have identified green-powered bubble plume destratification as the preferred mitigation option for detailed design and approvals works. WaterNSW is proposing a progressive 15-year delivery program of CWP mitigation that aligns with future five-year bulk water pricing determination periods as follows:

- **Current determination (Pindari Dam CWP Pilot):** This project is externally funded. CWP mitigation option studies and bubble plume detailed design & REF ahead of the planned aeration trial and green energy implementation works at Pindari Dam.
- **FY26-30:** Detailed design and approvals for preferred CWP mitigation option at Blowering, Copeton and Keepit dams and rectification of CWP mitigation at Burrendong Dam to address the reliability and serviceability failures of the previously installed curtain prototype.
- **FY31-FY35:** Implementation (construction, delivery and commissioning) of preferred CWP mitigation options at Blowering, Copeton and Keepit dams.

Table 13 lists the Cold Water Pollution projects to be designed or constructed in the 2025 determination period.

Table 13 – Cold Water Pollution infrastructure capital expenditure ($m)

Valley	Cold Water Pollution Project	Phase	Total FY26-30
Namoi	Keepit Dam	Design & approvals	$2.8
Gwydir	Copeton Dam	Design & approvals	$5.9
Murrumbidgee	Blowering Dam	Design & approvals	$6.9
Macquarie	Burrendong Dam	Construction	$31.2
			Total: $46.8

Customer Consultation on environmental investments

WaterNSW consulted with customers through the Water Working Groups on environmental investments (fishways and cold water pollution), specifically about the extent of customer contribution towards these projects. Currently 80% of the cost of environmental investments is paid by customers and 20% by Government. Customers were asked 1) Do you feel this split is about right and 2) If you didn't think this split was right, what should the split be? The results are shown in Figure 15 and Figure 16 respectively.

Figure 15 – Customer feedback on environmental investments Q1

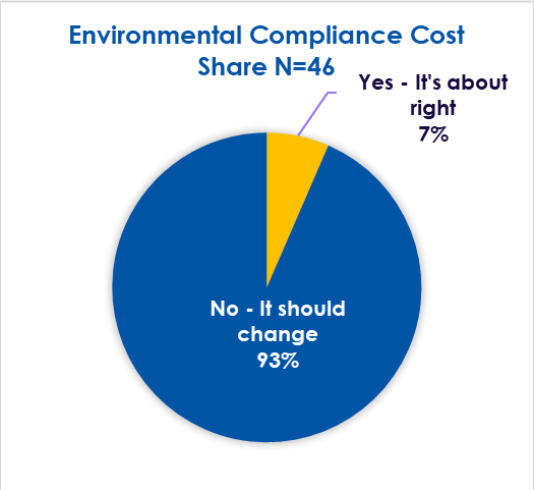
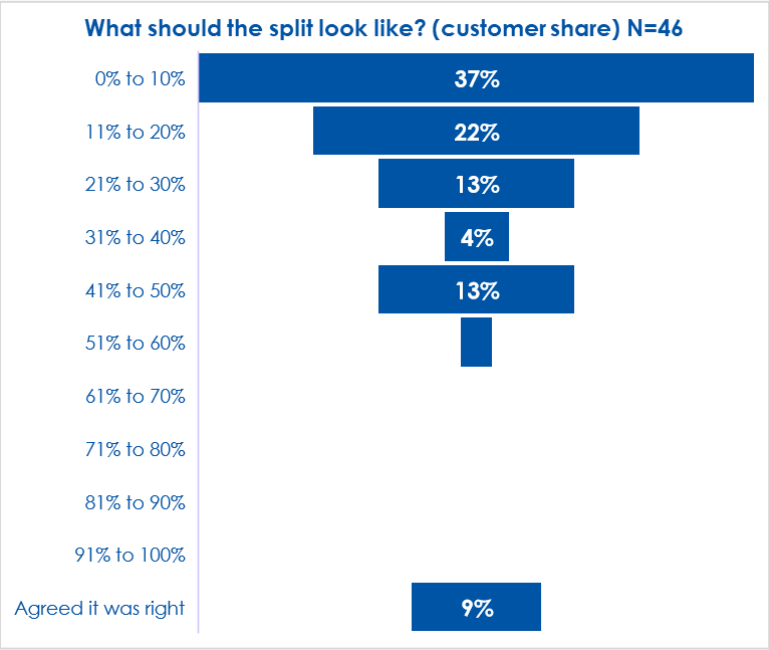


Figure 16 – Customer feedback on environmental investments Q2



Warragamba E-Flows Construction

Warragamba Dam has an impact on river health in the lower Hawkesbury-Nepean River. It's location within the catchment results in environmental impacts on the river below the dam with substantially reduced stream flows for prolonged periods of time. These reduced flows contribute to low water quality and extensive aquatic weed growth and algal blooms. These conditions compromise boating, fishing and swimming uses of the waterway, as well as impacting the amenity of the river for picnicking and other on-bank recreation activities.

WaterNSW was tasked by the then Department of Primary Industries, Water (DPI Water) with developing the detailed concept design (DCD), project costings and project management inputs for the Warragamba

Environmental Flows (E-Flows) project. Warragamba Dam E-Flows is a current priority under the Greater Sydney Water Strategy (DPE, August 2022).

The project involves constructing a multi-level offtake tower on the upstream face of the dam, refurbishment of the existing large penstock and modifications to the HEPS to enable release of variable e-flows. These variable flows aim to mimic flow patterns and conditions downstream of the dam as if the barrier to the river created by the dam did not exist. The E-Flows Project will deliver the following benefits:

- reintroducing flow variability;
- improving water quality;
- reducing problems caused by excessive growth of algae and aquatic weeds; and
- improving fish populations.

These will result in improved river health and recreational amenity for people using the lower reaches of the Nepean River between Warragamba Dam and at least as far as Windsor Bridge, the tidal limit point. These benefits will include an increase in the length and availability of the river suitable for swimming, boating, fishing, picnicking and other water and on-bank recreational activities.

Warragamba E-flows Construction has forecast capital expenditure of $301.8m for FY26-30.

6.5.3 Public safety projects

WaterNSW established a Public Safety Taskforce to oversee implementation of an initiative to mitigate unacceptable public safety risks. The initiative involved classifying sites, identifying public safety risks, performing controls assessments and implementing the control measures. High exposure sites have been prioritised for works in FY26-30, while Control measures for medium or low risk sites are planned to be implemented in FY31-35 determination. High exposure sites are those where the public frequently attend the site, such as:

- Dams / lakes.
- Camping grounds / picnic areas.
- Weirs / regulating structures in urban environments or with camping grounds or picnic areas.
- Water leisure activities such as swimming, boating, fishing, etc.

WaterNSW has identified the following control measures to mitigate unacceptable public safety risks:

- **Dams:** Physical security (fencing/gates/barriers), access control gates and warning signs
- **Weirs:** Boat barriers, warning signs, lighted warning buoys and life preserving equipment.

In addition to the above initiative, specific public safety projects were also prioritised for implementation in the 2025 Determination period. These projects included electricity pole replacement program, public safety works at unregulated weirs, warning buoy systems at weirs and safety barriers at spillways.

Total expenditure for FY26-30 on public safety projects is $2.9m in Greater Sydney and $4.1m in Rural Valleys.

Customer Consultation on public safety investment

WaterNSW engaged with customers through the Water Working Groups on different levels of public safety investment. The feedback received is shown in Table 14.

Table 14 – Customer feedback on public safety investment

Investment Level	Participant views of proposed investment
Do nothing Minimal investment to restrict access to sites	• Responsibility should not lie on WaterNSW to do this work and should not be paid for by customers or the community. This would be an investment targeted to a small minority who do not have common sense. • If someone chooses to disregard a safety sign that should be their responsibility. People will choose to do things regardless of signage. • Why should industry pay for people who are engaging in risky behaviour? A more effective way to address this is raise entry fees and publicly note that the reason for the charge increases is due to public safety. This would avoid placing the burden on customers.
Do something Up to $5.5 million over 5 years across all valley	• Public safety issues won't be eliminated, but we should do what is reasonably practical. • Maintenance of what is already there and possibly improving public safety should occur, however fully investing is unnecessary. • Signage should be more inclusive and use more imagery and visuals to explain rules. • Government should carry the burden of this cost, and it is an investment that should occur regardless of whether people are actively making poor decisions. • Costs should be spread out so that customers are not contributing to something that they do not necessarily benefit from that is accessible to everyone, such as dams. This could be done by creating an annual entry fee for users.
Do a lot Up to $9 million over 5 years across all valleys	• Risk cannot be reduced completely. The more you put in place to reduce the risk, the better. • Life Saving Australia has stated that over the last few years more people are drowning in freshwater than saltwater in Australia. Spending $5-$8 million is worth it to save just one life.

6.5.4 Electrical safety program

WaterNSW has commenced an Electrical Arc Flash Study to identify electrical equipment that poses an unacceptable risk of an electrical arc explosion. WaterNSW plans to progressively upgrade these electrical assets during FY26-30 and beyond, to mitigate unacceptable risks. Where justified and considered efficient, complimentary electrical works at the facility will also be undertaken to upgrade equipment to current standards or to improve reliability or efficiency of the facility.

WaterNSW estimated expenditure was spread across the FY26-30 and FY31-35 determination periods. Where valleys include electrical upgrade projects at key sites where arc flash risks need to be addressed, there is no Electrical Safety Program expenditure in these valleys in FY26-30. These electrical upgrade projects will address the arc flash risk as part of their scope.

Total FY26-30 expenditure for the electrical safety program is $4.3m in Greater Sydney and $4.9m in Rural Valleys.

6.5.5 Crane safety program

The crane safety program involves assessment, inspection and renewal of WaterNSW's fixed crane assets. Expenditure under the program is for working period assessments, periodic third party inspections and crane renewal works based on the outcomes of these assessments.

WaterNSW assessed 20 recent crane inspection reports and identified common minor and major rectification works. Based on this assessment a scope of work was developed for each crane on the asset register based on the crane type, capacity and age. Where no data existed for a crane, major rectification was assumed to be required.

A cost estimate for the scope of work for each crane was developed and presented the following investment options for each valley to WaterNSW stakeholders for the crane safety program for FY26-30:

- Option 1 – Address all cranes in some capacity
- Option 2 – Undertake major rectifications only
- Option 3A – Address high risk cranes only (including those with unknown risk)
- Option 3B – Address high risk cranes with major rectifications only

Stakeholders selected the option for each valley that reflected a balance of a prudent level of crane expenditure relative to the valley budget size. Lowbidgee. North Coast, Murray and Upper Nepean had no budget included under the crane safety program as they had specific crane renewal candidate projects or no fixed crane assets. The estimated expenditure was also spread evenly across the FY26-30 and FY31-35 determinations.

Total FY26-30 expenditure for the crane safety program is $3.6m in Greater Sydney and $6.4m in Rural Valleys.

7 Historic performance

For the current determination period, the WaterNSW Operations Portfolio proposed to invest:

- **Greater Sydney:** $374.8m of capital over the FY21-24 determination period.
- **Rural Valleys:** $265.7m of capital over the FY22-25 determination period.
- **WAMC:** $23.6m of capital over the FY22-25 determination period.

Table 15, Figure 17, Figure 18 and Figure 19 show actual/forecast capital expenditure versus the IPART allowance at a determination level.

Table 15 – Comparison of IPART allowance against actual/forecast expenditure, $'000s

Determination	IPART Allowance	Actual/Forecast	Variance
Greater Sydney *FY21-24*	374,818	212,442	-162,375
Rural Valleys *FY22-25*	265,679	159,550	-106,129
Water Administration Ministerial Council (WAMC) *FY22-25*	23,575	21,155	-2,419

Figure 17 – Comparison of actual / forecast capital expenditure and IPART allowance – Greater Sydney (FY21-24)

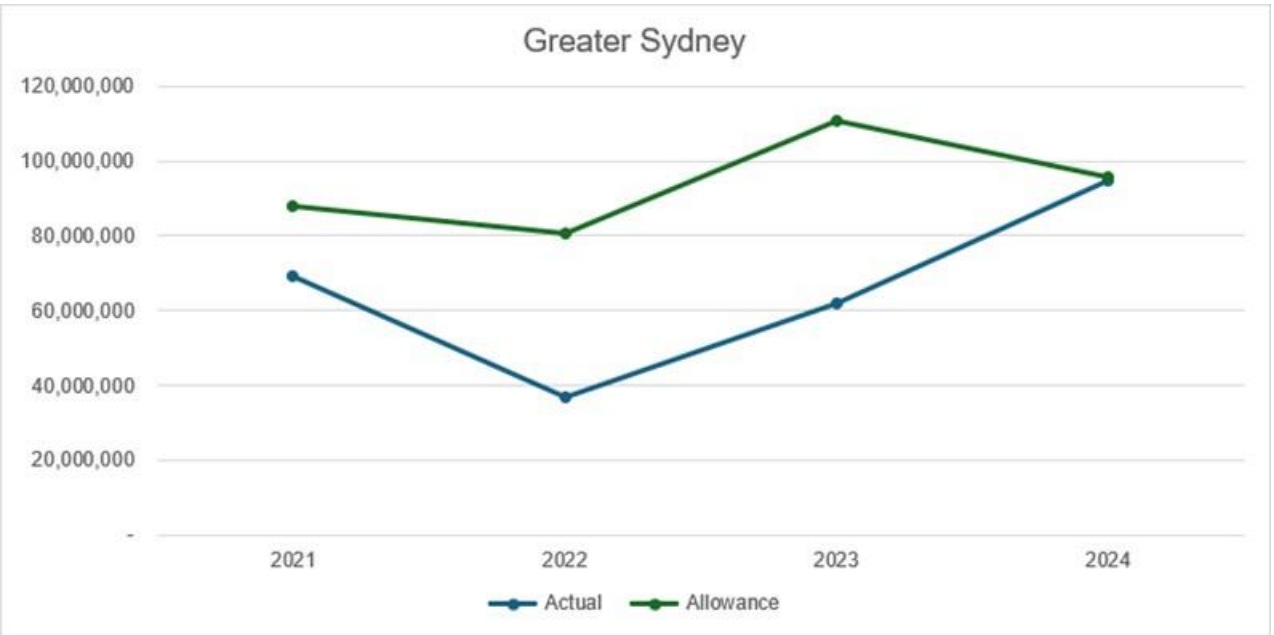


Figure 18 – Comparison of actual / forecast capital expenditure and IPART allowance – Rural Valleys (FY22-25)

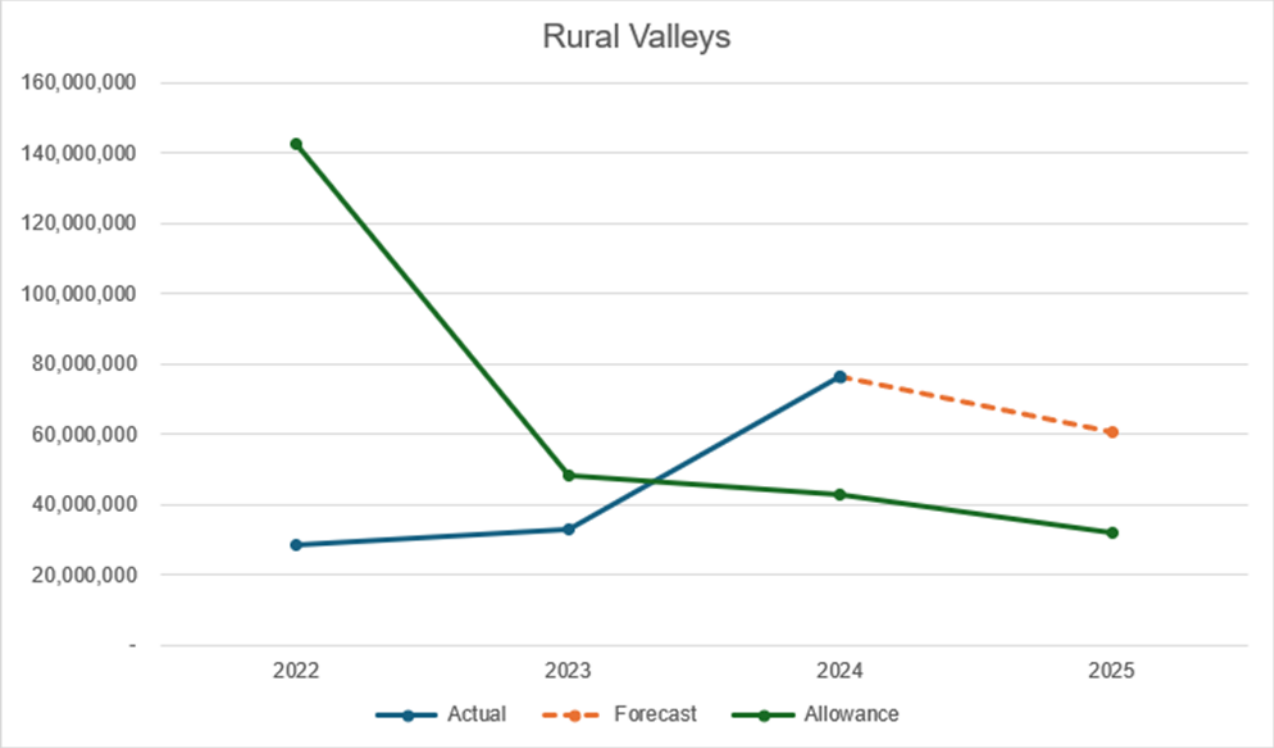
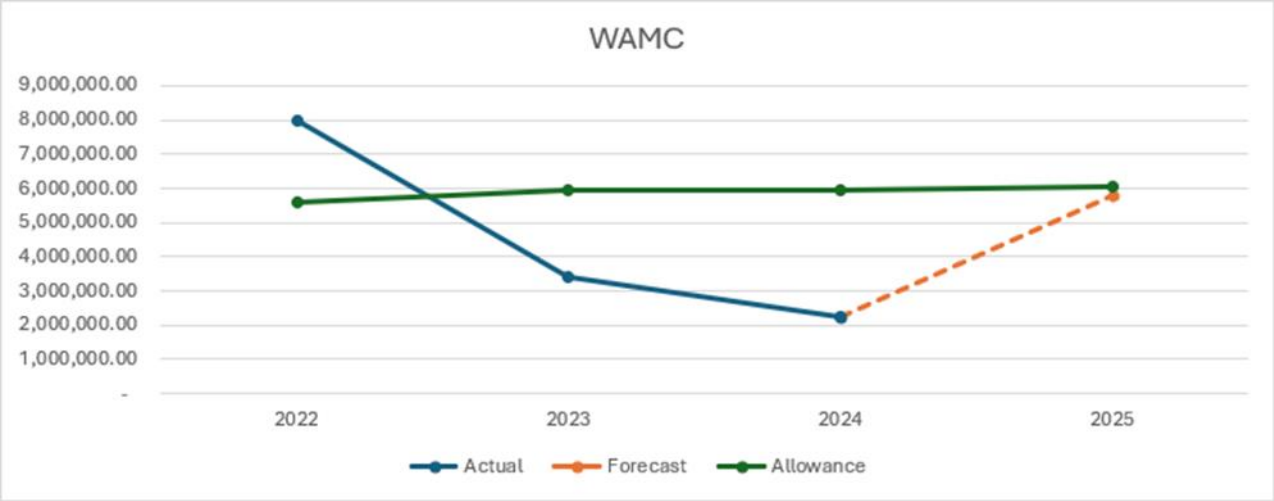


Figure 19 – Comparison of actual / forecast capital expenditure and IPART allowance – WAMC (FY22-25)



Across all determinations, capital expenditure in the earlier years (between FY21 and FY24) was lower than the respective IPART allowances, while capital expenditure in the later years (FY25) is higher. The following section provides a high-level overview of the performance in the current regulatory period, including drivers for these variances.

7.1 Macro drivers for variances

The variance between actual/forecast capital expenditure and the allowances set by IPART can be attributed to several macro factors. The period was heavily impacted by the COVID-19 pandemic. Lockdowns, border closures and other government restrictions severely impacted the ability to deliver works due to limitations on labour availability and flow-on effects through the supply chain. The impact of climate change is also increasing significant weather events, with severe flooding and bushfires impacting capital delivery across regions of NSW.

These factors and their impacts are described in detail below.

7.1.1 Projects cancelled/deferred by Government

The Mole River Dam, Wyangala Dam Wall Raising and Dungowan Dam projects were transferred to Water Infrastructure NSW and subsequently cancelled.

The planning and design timing for the Warragamba Dam E-Flows Project was originally aligned with Warragamba Dam Raising (WDR) to capitalise on significant efficiencies resulting from simultaneous delivery of both projects. WDR formed part of the INSW Hawkesbury-Nepean Valley Flood Risk Mitigation Strategy that was subsequently cancelled by the NSW government in May 2023. With WDR being cancelled Warragamba Dam E-Flows is now being progressed as a standalone project.

7.1.2 Bushfires

The 2019–20 Black Summer fire season was the most severe bushfire season ever recorded in NSW, with fire grounds in NSW covering 5.5 million hectares (7% of the state), including over 2.7 million hectares of national parks (38% of the NSW national park system). This resulted in the contamination of water sources due to ash, sediment runoff, personnel access risks and increased levels of pollutants entering waterways, contributing to difficulty progressing certain projects throughout FY21 and FY22.

7.1.3 Floods

The heavy floods that occurred throughout NSW between 2020 and 2023 directly impacted the delivery of capital projects. The floodwaters and resultant damage to infrastructure and environment, particularly in rural and regional areas, severely affected WaterNSW's ability to progress projects. Several planning and construction activities were halted due to lack of safe access to structures and sites, resulting in delays and extensions in many project timelines. These delays contributed to lower than budgeted levels of expenditure between FY21 and FY23.

For example, in March 2022, heavy rainfall events caused a landslide at Pheasant Nest which resulted in the destruction of the gate infrastructure which took out the Nepean Tunnel, limiting alternate water supply options for WaterNSW. The flood events also caused water quality issues in the Upper Nepean system and Prospect Reservoir. As a result of this, the pipeline outages on the Warragamba Pipeline Valves & Controls Upgrade Project that rely on these alternate supply options were reduced significantly and deferred to 2023.

7.1.4 COVID-19

The introduction of lockdowns, border closures and other restrictions in response to the pandemic had a significant impact on WaterNSW's operations. These measures led to delays in obtaining approvals and conducting inspections, ultimately resulting in deferrals to project delivery. For example, the Warragamba Valves and Controls Upgrade project, which commenced in 2018 was postponed for two years.

Travel restrictions, particularly during the second major lockdown in 2021, resulted in a complete halt of projects in regional valleys for six months. For example, the Kangaroo Pipeline Renewals Project road and drainage package experienced delays of 6 months in securing civil earthworks subcontractors due to constrained market conditions.

The significant economic uncertainty stemming from the pandemic led to WaterNSW adopting a conservative approach towards progressing projects. Consequently, this resulted in low levels of expenditure during FY21 and FY22.

7.1.5 Supply Chain – Delays

Supply chains for materials and equipment used on WaterNSW projects were disrupted by government responses to COVID-19. The impact of these disruptions was experienced across various sectors, including manufacturing and transportation, leading to delays in production, shortages of critical components and logistical bottlenecks. As a result, this led to difficulty in sourcing materials and equipment and maintaining adequate inventory levels, causing delays in project delivery.

There were significant lead times for materials and equipment including concrete and geotextile matting for earthworks projects on the Warragamba Pipeline Corridor Civil Works packages and delays on electrical instrumentation and controls equipment on projects including Blue Mountains Asset Renewals.

7.1.6 Labour shortages

Labour shortages in the construction and consulting industry have directly impacted WaterNSW's operations in the current regulatory period. This has resulted in increasing wages to attract skilled workers, leading to higher labour costs to deliver projects, particularly in regional areas. In addition, delays in projects due to the lack of skilled workers and higher employee turnover have resulted in extended project management and holding costs contributing to higher project costs.

Labour shortages in the industry also impacted contractors and their subcontractors, resulting in volatility in pricing and resource availability, leading to higher risks and contingencies required to progress projects. This has ultimately led to higher-than-expected costs.

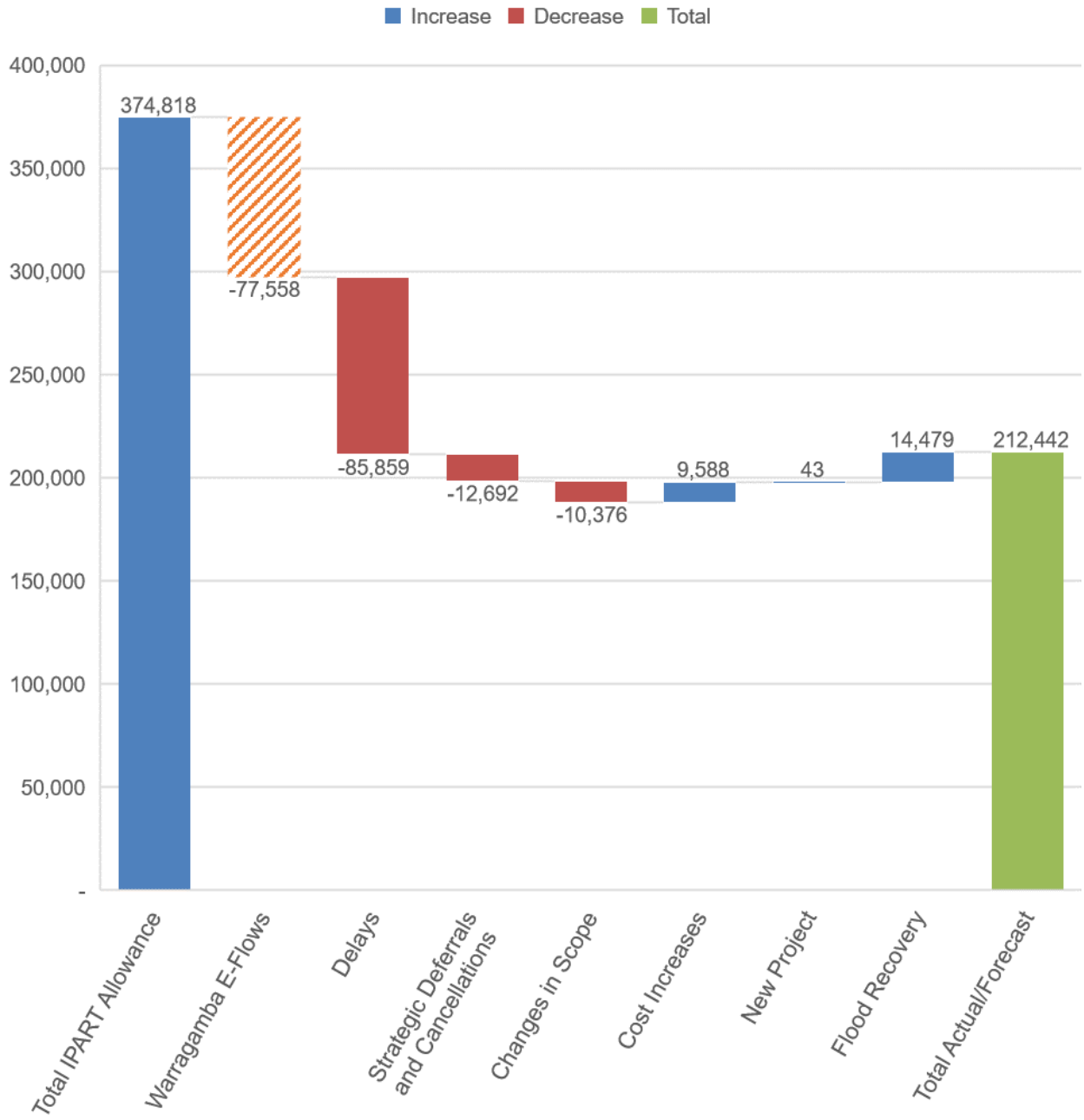
7.2 Capital expenditure variance analysis

7.2.1 Greater Sydney

Total capital expenditure allowance for the WaterNSW Operations Portfolio set by IPART for the FY21-24 regulatory period was $374.8m. Actual/forecast expenditure is expected to be $212.4m, which is $162.4m (43%) lower than the IPART allowance.

The variances between the allowance and actual/forecast capital expenditure over the current determination period is illustrated in Figure 20 and discussed below.

Figure 20 – Key reasons for variance Greater Sydney ($'000s)



7.2.2 Greater Sydney – variance drivers

Lower than budgeted expenditure in Greater Sydney can largely be attributed to the strategic deferral of Warragamba E-Flows ($77.6m) and delays ($85.9m). This is partially offset by higher-than-expected expenditure due to flood resilience and recovery ($14.5m) as a result of the March 2022 storm event and cost increases ($9.6m).

Part of the driver for increased capital expenditure in FY26-30 is completion of deferred and delayed works from the current determination period.

Strategic deferrals and cancellations

Strategic deferral and cancellations lowered actual/forecasted capital expenditure by $90.3m, predominantly due to the government decision not to proceed with the Warragamba Dam Raising Project, and the resultant impact on the Warragamba E-Flows project, which was being planned for concurrent delivery. . In addition, Greater Sydney drought response projects were strategically cancelled due to rationalisation of scope following a transition into prolongued wet weather conditions and full storages.

Delays

Delays lowered actual/forecasted capital expenditure by $85.9m.

Delays can largely be attributed to changing conditions following bushfires and flood events resulting in the lack of safe access to structures and sites, as well as the imposition of restrictions during COVID-19 which led to delays in obtaining approvals, conducting inspections and undertaking works. In addition, delays have been driven by the complexity of assessments resulting in strategic options assessment and selection. Dam Instrumentation Automation Telemetry has fallen behind schedule due to delays in the outputs from portfolio risk assessments following a thorough review of technical scopes.

Changes in scope

Changes in scope lowered actual/forecasted capital expenditure by $10.4m.

Renewal and replacement activities experienced changes in scope following strategic options assessment and selection as a result of the complexity of assessments. In particular, the Blue Mountains Electrical Monitoring and Control, Kangaroo Pipeline Renewals and Shoalhaven Control Gate Renewals packages were actualised based on revised scope.

Cost increases

Cost increases resulted in an increase to actual/forecasted capital expenditure by $9.6m.

Data from the Australian Bureau of Statistics (6427.0 Producer Price Indexes, Series ID A85219099L) shows that heavy and civil engineering construction costs have increased by 22% from the June 2020 quarter to the June 2024 quarter.

Supply chain issues and labour shortages resulted in higher than anticipated costs for projects such as the Blue Mountains Electrical Monitoring and Control, Kangaroo Pipeline Renewals and Shoalhaven Control Gate Renewals.

Flood recovery

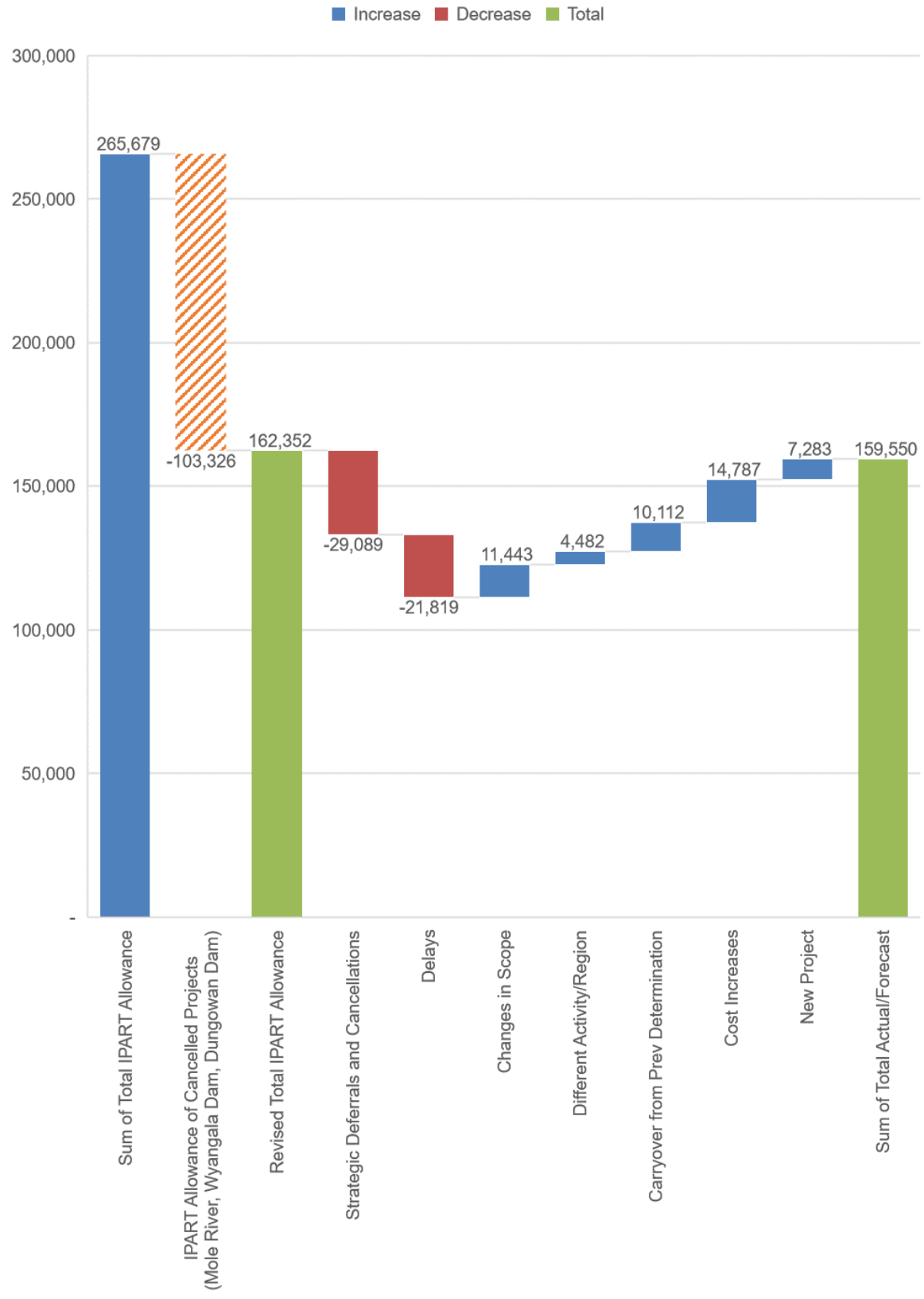
The March 2022 storm event resulted in unplanned expenditure for flood resilience and recovery efforts, increasing actual/forecast capital expenditure by $14.5m.

7.2.3 Rural Valleys

Total capital expenditure allowance for the WaterNSW Operations Portfolio set by IPART for the FY22-25 regulatory period was $265.7m. Actual/forecast expenditure will be $159.6m, which is $106.1m (40%) lower than the IPART allowance.

The variances between the allowance and actual/forecast capital expenditure over the current determination period is illustrated in Figure 21.

Figure 21 – Key reasons for variance Rural Valleys ($'000s)



7.2.4 Rural Valleys – variance drivers

Lower than budgeted expenditure in the Rural Valleys can largely be attributed to the strategic cancellation of Mole River Dam, Wyangala Dam and Dungowan Dam ($103.3m), other strategic deferrals and cancellations ($29.1m) and delays ($21.8m). This is partially offset by cost increases ($14.8m), changes in scope ($11.4m) and projects carried over from the previous determination ($10.1m).

Part of the driver for increased capital expenditure in FY26-30 is completion of deferred and delayed works from the current determination period.

Strategic deferrals and cancellations

Strategic deferral and cancellations lowered actual/forecasted capital expenditure by $132.4m.

This is predominantly due to the transfer of three large infrastructure projects (Mole River Dam, Wyangala Dam Wall Raising and Dungowan Dam) with an allowance totalling $103.3m to Water Infrastructure NSW, which were subsequently cancelled. The remaining $29.1m can be largely attributed to the strategic deferral of the construction of fishways at Wyangala Dam, Marebone Break Regulator and Gunidgera Weir.

Delays

Delays lowered actual/forecasted capital expenditure by $21.8m.

Similar to Greater Sydney, delays experienced in the Rural Valleys can largely be attributed to changing conditions following bushfires and flood events, as well as the imposition of restrictions during COVID-19 resulting in delays in obtaining approvals, conducting inspections and undertaking works. Additionally, many valleys experienced delays due to the complexity of optioneering and condition assessments, as well as reviews of technical scopes relating to portfolio risk assessment activities following initial hydrologic and seismic hazard assessments.

Changes in Scope

Changes in scope increased actual/forecasted capital expenditure by $11.4m.

This is largely due to heightened embankment failure risk for the Lake Cargelligo embankment upgrade in the Lachlan Valley, in addition to revised scope for the Copeton Dam electrical renewals following optioneering in the Gwydir Valley.

Carryover from previous determination

Projects carried over from the previous determination increased actual/forecasted capital expenditure by $10.1m. This is primarily due to the Pamamaroo Inlet Regulator Long Term Works in the Murray Valley.

Cost Increases

Changes in scope increased actual/forecasted capital expenditure by $14.8m, predominantly due to the Lake Cargelligo embankment upgrade in the Lachlan Valley.

New Projects

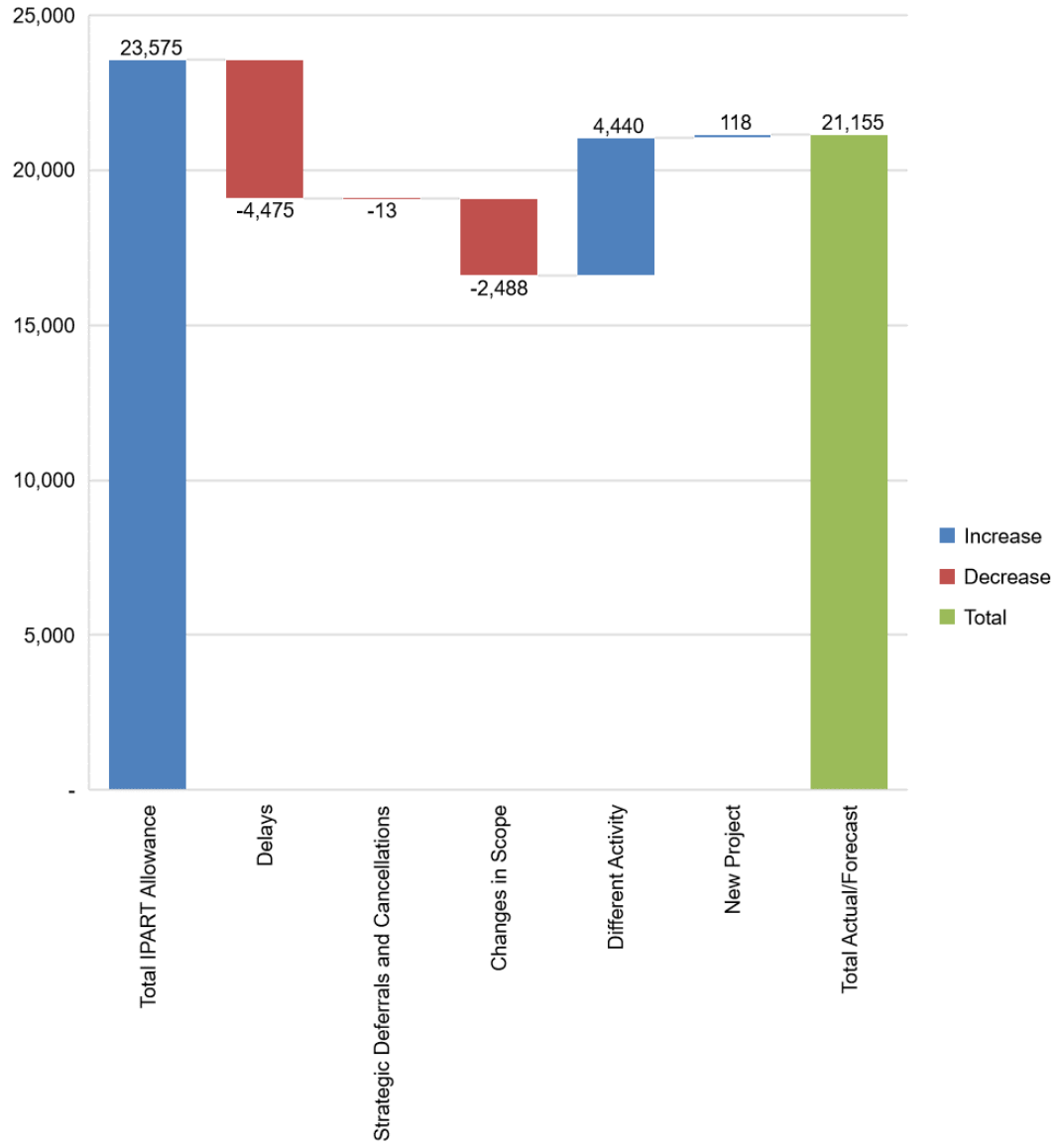
New projects contributed to actual/forecasted capital expenditure increasing by $7.3m. This can be attributed to the manganese dosing plant in Fish River, the Burrinjuck Dam High Level Outlet Emergency Closure Gates Upgrade in the Murrumbidgee Valley and the completion of construction of the Chaffey Pipeline as an emergency drought response measure in the Peel Valley.

7.2.5 WAMC

Total capital expenditure allowance set by IPART for the FY22-25 regulatory period was $23.6m. Actual/forecast expenditure will be $21.2m, which is $2.4m (10%) lower than the IPART allowance.

The variances between the allowance and actual/forecast capital expenditure over the current determination period is illustrated in Figure 22 and discussed below.

Figure 22 – Key reasons for variance WAMC ($'000s)



Delays

Delays lowered actual/forecasted capital expenditure by $4.5m. This is predominantly due to delays in finding engineering and design partners with the appropriate skills and experience due to labour shortages, as well as delays in approvals through the MCP procurement model.

Changes in Scope

As a result of conducting condition reviews, project scopes were revised which lowered actual/forecast capital expenditure by $2.5m.

7.3 Historic performance against output measures

IPART has set output measures for WaterNSW as a starting point for measuring the prudence and efficiency of capital expenditure in its price reviews. Performance against the output measures from the 2021-25 Greater Sydney and 2022-25 Rural Valley determinations are shown in Table 16 and Table 17.

Reports are published on IPART's website detailing WaterNSW's performance against WAMC output measures. The most recent report is: Performance against WAMC Output Measures in 2021-22.

Note – For convenience we have included reported performance against all output measures here, not just those related to Infrastructure Capital Investment.

Table 16 – Performance against output measures (Greater Sydney)

Project	Capital Expenditure to FY24[1]	Output measure	WaterNSW Proposed Completion Date	Atkins Recommended Completion Date	Reported Activity
Fitzroy Falls Dam Safety Upgrade	$nil	Completion of Stage 1 works, internal erosion interception trench	Jun-22	Jun-22	The dam safety risk assessment results have been updated for Warragamba and Fitzroy Falls following the GS Submission. Given the current risk profile for both these dams and our regulatory compliance obligations, we have substituted funding for Fitzroy Falls to Warragamba.
Cataract Dam Safety Upgrade	$0.4m	Completion of Stage 1 works, installation of foundation relief drains and access ramp	Jun-24	Jun-24	Drain restoration activities have been completed. The dam safety risk position has been updated and has supported the control measures to be implemented. Optioneering has been completed and are progressing into the next phase of design.
Cordeaux Dam Safety Upgrade	$nil	Completion of Stage 1 works, completion of foundation relief drain expansion and upgrade	Jun-24	Jun-24	Drain restoration activities have been completed at the dam. The dam safety risk assessment results have been updated for Cordeaux Dam following the GS Submission. Given the current risk profile and our regulatory compliance obligations, dam safety upgrade is currently not required. The funding has been substituted to support risk reduction measures at non-compliant dams within the Greater Sydney portfolio (automated survey, instrumentation upgrade, Cataract Dam safety upgrade and Warragamba project).
Warragamba Pipelines valves and controls upgrade	$26.9m	All valves in program installed and commissioned	Jun-23 – revised to Dec-24	Jun-23	The D&C Construction Contractor Brolton Group Pty Ltd went into administration in September 2022 and liquidation in January 2023. WaterNSW proceeded to engage alternate D&C Contractor, Abergeldie Complex Infrastructure Pty Ltd. Outage 1 – was completed in June 2023 replacing Valves V10, V16 , V06 and V38. V11 was taken for refurbishment.

[1] Includes actuals and forecasted estimates.

Project	Capital Expenditure to FY24[1]	Output measure	WaterNSW Proposed Completion Date	Atkins Recommended Completion Date	Reported Activity
					Outage 2 – was cancelled and deferred to June 2024. The work was completed in June 2024. Outage 3 – completed in August 2023 replacing Valves V08 and V37. Outage 4 – to reinstall a refurbished V11 and replace V39 was completed in October 2023 Outage 2 was deferred due to Prospect Reservoir Channel 2 structural issues that limited the operation of Prospect RWPS. Outage 2 could not go ahead until a temporary fix is carried out to the deteriorated channel slabs. Outage 2 is now tentatively re-scheduled for June 2024 meaning the Project has a revised completion date in December 2024 installation of remaining valves and overall system commissioning of the Valves.
Avon Deep Water Storage	$0.5m	Practical completion of infrastructure that enables access to 'dead storage' of Avon Dam to the Illawarra Water Filtration Plant	Jun-24	*Atkins have recommended removing this project*	Project was not undertaken once drought was no longer a threat in Greater Sydney, consistent with recommendation by Atkins.
Dam Safety Telemetry	$4.7m	Automation and telemetry of relevant instrumentation for selected metropolitan sites listed under project	Jun-24	Jun-24	Automation and telemetry have been installed at high-risk dam sites (Upper Nepean dams, Fitzroy Falls & Prospect Dam). Warragamba automated survey is undergoing final handover and commissioning.
Warragamba E-flows	$2.4m	Commissioning and proving period commenced for Warragamba E-flows to provide capability to release increased environmental flows from Warragamba Dam	Dec-24	Dec-25 (outside of determination period)	This project was planned to be delivered concurrently with the previously planned Warragamba Dam Raising Project for cost efficiencies. The Warragamba Dam Raising project for flood mitigation was cancelled following a government decision. It is now being planned for delivery as a stand-alone project as originally intended. .;It is now expected to be complete by 2030 based upon current the current program.

Table 17 – Performance against output measures (Rural Valleys)

Project	Capital Expenditure to FY25[2]	Output measure	Expected completion	Activity	Reported Activity
Lake Cargelligo Embankment upgrade works	$27.5m	Completion of embankment safety works to bring risk assessment into tolerable zone of SFAIRP ('so far as reasonably practicable')	FY23	Detailed design and construction of embankment raising and filter works.	The design activities have been completed and construction works have commenced. The need to review design has been identified based on-site conditions so that risk-focused solutions can be implemented. The project is ongoing.
Fish pass offset pilot projects	$7.3m	Completion of the Gunidgera, Marebone Break Weir and Lake Cargelligo Outlet Regulator fish passage offset schemes to the satisfaction of DPI Fisheries	FY25	Detailed design and construction of the novel fish passage schemes at the 3 weirs and agreed with DPI Fisheries.	WaterNSW has identified preferred option, basis of design and cost estimates at all three sites: Gunidgera Weir, Marebone Break Regulator and Lake Cargelligo Inlet Regulator. The detailed design is currently underway, inclusive of environmental assessments. Note that Lake Cargelligo Outlet Regulator has been substituted by the Lake Cargelligo Inlet Regulator. Significant increase in estimated budget to completion has meant construction needs to be deferred to next Determination (FY26-30): Fisheries was consulted on this approach and are supportive of the new program approach.

[2] Includes actuals and forecasted estimates.

Project	Capital Expenditure to FY25[2]	Output measure	Expected completion	Activity	Reported Activity
Fish pass planning, design, programming	$7.3m (as above)	Final business case and detailed designs for the remaining 9 fish passage offset schemes, taking account of the lessons learned from the pilot schemes, to the satisfaction of DPI Fisheries	FY25	On the basis of the construction and evaluation of the 3 pilot fish pass schemes at Gunidgera, Marebone Break Weir and Lake Cargelligo, and following progression of the construction at Tyreel Weir, progress with developing the business cases and detailed design and program for delivery of the remaining 8 fish pass schemes in the 2025 determination period to the satisfaction of DPI Fisheries.	WaterNSW has identified preferred options, basis of design and cost estimates at all remaining DSU Offset Fishway sites. Preliminary business cases will be completed for these in FY25. The revised strategy seeks budget for construction in FY26-30 for four fishways, with the remaining in the following determination.
Asset renewals and condition	$106.3m	Report on: a) service orders requiring reactive maintenance, broken down by asset sub-types b) number of assets with a criticality rating of 4 or above, broken down by asset sub-types.	Report annually		a) There were 3,670 reactive maintenance work orders completed in Rural Valleys in 2023-24. Details of break-down by asset sub-type are attached. b) There are 2,779 assets in Rural valleys which have criticality rating of 4 or above. Details of break-down by asset sub-type can be provided upon request.
Asset performance and health	N/A	Develop asset risk evaluations across all appropriate asset classes	FY25	This will improve understanding of underlying asset risk and ultimately support future	The Asset Health Report is designed to summarize the health and past performance of WaterNSW's asset portfolio, organized by key asset classes and regional areas. It evaluates asset health in terms of condition and criticality, while performance is inferred from observed failures and the resulting incidents. The report aims to ensure that assets are reliable

Project	Capital Expenditure to FY25[2]	Output measure	Expected completion	Activity	Reported Activity
				expenditure and investment decisions	and maintained to acceptable standards in line with the objectives of the WaterNSW Strategic Asset Management Plan. Additionally, it provides insights into the overall health and performance of the portfolio, comments on the effectiveness of asset strategies, maintenance activities, and the recent renewals plan, and supports decision-making processes for asset renewal. Furthermore, the report offers insights into the quality of asset data, with the goal of improving data-driven asset management and investment decisions.
Fish river scheme	N/A	Develop and implement a customer impact measure (e.g. minutes lost per customer) for water supply interruption events that can be used to measure performance	FY22	This will improve the focus on customer impacts of water supply interruption events rather than only the number of events that take place and drive operational improvements within the scheme. Once baselined this can be used to show performance and impact of events against various asset classes on the scheme	Schedule 3 Water Management Act 2000 has identified WaterNSW as a water supply authority only in relation to the Fish River Water Scheme. As a water supply authority, WaterNSW must undertake effective and evidence based strategic planning for the exercise of our functions that, in the opinion of the Secretary, or person nominated by the Secretary. WaterNSW has developed a long-term strategic plan for Fish River Scheme (refer to D2024/44722) and submitted to the NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) as Secretary's nominated authority. WaterNSW has taken holistic approach to develop this strategic plan to fulfil the relevant regulatory requirements and set up a long-term strategic view of the scheme. The strategy has been centred around an adaptation pathway framework, enabling a dynamic and flexible strategy for WaterNSW in managing the scheme over the long-term. This approach will support us to optimise the short-term capital investment and minimise the customer bill impacts while improving the customers desired service requirements. As part of the strategic planning process, we have also developed baseline levels of service for the scheme in consultation with the Fish River customers. These levels of service measures could be used as indicators to assess the performance of the scheme.
Non-Asset Related Output Measures					

Project	Capital Expenditure to FY25[2]	Output measure	Expected completion	Activity	Reported Activity
Cost Allocation Manual	N/A	Agreement on an updated Cost Allocation Manual with IPART	December 2021	To reflect the recommendations of the corporate cost allocation review in Section 8 of Atkins' Final Report, March 2021.	Implemented by Dec 2021 and notified IPART 23/12/2021
Long term transformational strategy		Development and implementation of a detailed transformational strategy setting out clear actions, quantified expenditure efficiencies and customer benefits by year with the aim of becoming an efficient, effective and customer-focused organisation. The strategy should also set out the approach to be used for benefits realisation tracking	July 2023 – Development of strategy FY24 and FY25 – Implementation and benefits realisation tracking	Report progress in the AIR or as agreed with IPART.	Our latest corporate strategy was developed in 2021/22. This incorporated 5 strategic priorities: • Delivering Operational Excellence • Building a sustainable future • Developing our people and capabilities • Working together in partnership • Resected by the Customers and Communities we serve Each year we review and revise Board approved strategic initiatives with specific milestones and outcomes that will help meet the objectives of the 5 strategic principles. The outcomes are measured in a number of ways: • We have a set of corporate KPIs (financial and non-financial) that provide a high-level measure of our performance against agreed targets. These performance targets and outcomes are published in our Annual report. • Monitor and report on progress and year end outcomes on all strategic initiatives based on agreed scope for these set at the beginning of each year • Track and report on cost efficiencies achieved across the business

Project	Capital Expenditure to FY25[2]	Output measure	Expected completion	Activity	Reported Activity

Customer measure		Achieve 68% score for 'Skyline' composite measure and regularly publish regularly the results	FY25	The measure is based on customer perception from the annual research programme survey and built up from 4 sub measures: the suitability of services provided; satisfaction with services provided; value for money; and quality of relationships. Results should be shared via the principal customer communication channels (e.g. WaterNSW website, annual report).	The Skyline Metric has been discontinued.
					
					We adopted new customer satisfaction KPIs last year (easy to do business, trust, value and water delivery) as measured by the Voice of Customer Survey.
					
					In FY24 WaterNSW's performance against all four customer KPIs were all within the target performance range.
					• Easy to do business – 5.31 (target range 5.05 to 5.80)
					  • Trust – 5.93 (target range 5.71 to 6.46)
					  • Value – 6.33 (target range 6.15 to 6.90)
					  • Water delivery – 5.26 (target range 5.22 to 5.97)

Implementation of the WAVE Program		Completion of full scope of the programme on budget as per final business case presented to Board 27 May 2020, comprising operational technology, analytics and water market components and providing the benefits identified in the business case(s) used to justify the expenditure	FY24	Program objectives: - service and efficiency improvements by allowing low value tasks to be automated - centralised management of water information by improving access to up-to-date and reliable water information for personnel and customers. Consolidation of ICT systems with harmonisation and integration of ICT landscape to drive	To date, the WAVE program has required 13% more investment (i.e. $6.15m), and is in a position to: • successfully mitigate the risk of critical business system failure; • realise 85% less quantified (or commercial) benefits than originally forecast in the original business case, but instead realised significant enabling capability to support the future cost transformation initiatives of WaterNSW over the 2025-30 regulatory determination period, that would otherwise not have been possible (viz: such as "remote operations". Refer to Appendix 9 – Efficiency Program). The risks of system failure of outdated legacy systems are progressively being mitigated through the introduction of replacement systems through WAVE, such as the Water Market Systems (WMS) PEGA platform and WaterInsights. These benefits were not quantified in a commercial 'ROI' sense in the original business case but are the major driver of investment.

Project	Capital Expenditure to FY25[2]	Output measure	Expected completion	Activity	Reported Activity
				operational efficiencies and enable improved performance of services through better insights from high integrity data. Mitigation of risks through improving integrity and reliability of business processes and data management.	Commercial Business benefits related to Water Market Systems element of the program ($4.61m) are however on track for realisation as per current approved program schedule. The program has also delivered sound foundations for WaterNSW and the NSW water sector. Some notable achievements; 1. Delivered a foundational Water Market System platform in PEGA that is modern and digitally enabled. 2. WAVE, and in particular the WMS program, has afforded positive results from a multi-agency "Water Ecosystem" perspective, as WaterNSW is now positively recognised across the other NSW Government water agencies 3. Delivery of the Water Data (WD) and Water Delivery Visualisation (WDV) functionality has enabled foundational platforms for future benefits. Positions WaterNSW to make further use of near real time water data and to improve operational support systems e.g. CARM (Computer Aided River Management), strengthening operational decision making.

8. Capital program delivery

The following sections summarise the procurement arrangements WaterNSW will utilise to deliver the capital works program, and how early schedule development informed the size, composition and timing of the capital program for FY26-30 and beyond.

8.1 Background

Prior to FY22, WaterNSW delivered a significant portion of its capital works through its Maintain Capability Program (MCP) Procurement Model. The MCP Construction Panel consisted of three panel members. However, the performance of these contractors was mixed, resulting in considerably prolonged project durations and significant cost escalations. Two of these contractors have since exited the water industry. A refreshed panel was established with Comdain and Abergeldie as participants for FY19-21. This was an interim procurement approach while awaiting the new Asset Renewal and Replacement (ARR) Framework to be established and implemented.

WaterNSW embedded several strategic improvements into its procurement arrangements, resulting in the following three procurement approaches:

- **Asset Renewal and Replacement (ARR) Framework** – the main procurement approach, used for the majority of projects that maintain and expand capability and service delivery.
- **Procurement Framework** – used for projects that require specialist skills or regional projects that would otherwise not be cost-effective under the ARR Framework.
- **Operations Professional Services Panel** – used for the procurement of operations professional services, other than design (which would use the ARR Framework).

8.2 Program delivery model

8.2.1 Asset renewal and replacement (ARR) framework

The ARR Framework was implemented in FY22 with the onboarding of the engineering and design partner (a joint venture between WSP and SMEC) and construction partners (Diona and Abergeldie). The engineering and design partner undertakes design and planning works that result in scope of works for the construction partners.

Construction projects that are below a $5m threshold are allocated to the construction partners based on a direct allocation method. These projects are divided equally (in value and nature) between the two construction partners. Construction projects that are above the $5m direct allocation threshold are allocated between the two construction partners following a competitive process, which is judged on technical, non-technical and pricing elements. The allocation of projects is based a range of criteria, and after the second year also includes allocation based on performance measurement from Key Performance Indicators (KPIs) now have a bearing on work allocation.

A contract and vendor management audit undertaken in FY22 by KPMG noted the following positive observations regarding the implementation of the ARR framework:

1. There has been an improvement in the process of reviewing and monitoring invoices and payments for the three contracts in scope that were also included in the 2021 internal audit. No exceptions were noted in the sample testing of invoices and payments across all contracts reviewed in this internal audit.
2. WaterNSW has developed detailed Contract Administration Manuals (CAMs) for both the ARR Construction Partner (CP) and the ARR Engineering Design Partner (EDP) contracts. Having these

manuals developed by the team who were involved in the procurement and contract negotiation (pre-contract award) stage is a good practice model for very complex contracting arrangements. These CAMs are supplemented with a set of Annexures with procedural guidance/directions such as an obligations tracker, variation process flowchart and a payment claim process flowchart.

3. The SCOUT system is used to capture, monitor and report performance against KPIs across all ARR EDP work packages. The Procurement Team Specialist sets up the Contract KPIs template in the SCOUT system and facilitates monthly KPI performance review meetings.

The framework has contributed significantly to uplifting performance by:

- Removing the separate design and delivery procurement process, which was inefficient and led to variable outcomes;
- Ensuring suppliers are invested in meeting overall program outcomes, rather than focused on individual projects;
- Increasing confidence in price certainty and reducing unplanned risk exposure; and
- Increasing the identification and continuous management of risks (planned and unplanned).

Outcomes that have been achieved included improved timeframes in awarding work to the market and the effective delivery of those services from a time, quality and cost perspective. The ARR Framework has successfully provided greater value for customers by increasing certainty in delivery and enhancing WaterNSW's capability.

As part of our commitment to continuous improvement, several workshops have been recently held with our partners to identify areas for performance improvement of the program. The outcome of these workshops will continue to drive further improvements throughout FY25.

8.3 Portfolio Governance

In WaterNSW portfolio level governance provides support delivery of the capital investment projects by helping streamline projects' approval process, manage risks and issues and, where necessary, escalating as appropriate.

WaterNSW has implemented a robust Portfolio Governance Framework (PGF) to satisfy the financial delegation model (yearly MCP program sub delegation to Executive Manager Operations) whilst incorporating best practice approach to governance, assurance, controls and decision making.

The purpose of this framework is to provide a structured, fit for purpose and pragmatic approach.

By establishing a set of guiding principles for project and portfolio decision making, quality of project artefacts and by providing certainty around timeframe for those decisions. It also allows resolution of risks and issues with a top-down approach.

Portfolio governance committee structure consist of two forums, Asset Quality Committee (AQC) and Portfolio Governance Committee (PGC). These committees function as stage gates to ensure appropriate investment governance and endorsement for key project artefacts. They also manage portfolio risks and impacts to the financial year targets.

Based on complexity and risks associate to some of the programs, program level SteerCo will be an additional layer of the governance that focuses on specific programs.

8.3.1 Procurement framework

The Procurement Framework serves as a strategic avenue for projects that fall outside the scope of the ARR Framework, particularly those requiring specialist skills, or regional initiatives that may not be cost-effective under the ARR Framework.

This framework operates efficiently by streamlining procurement processes based on project value. A single quote is obtained for projects valued up to $50k, while those up to $250k require three quotes. For projects exceeding $250k, an open tender process is used, which involves conducting thorough market research to develop appropriate procurement plans and strategies, and typically involves developing a request for proposal (RFP).

By segmenting the procurement process according to project value, the framework ensures that resources are utilised efficiently while minimising unnecessary costs. In addition, for larger projects exceeding $250k, the open tender process encourages supplier competition, resulting in more favourable pricing and terms. It also facilitates an informed decision-making process to engage the most suitable supplier, further contributing to efficiencies in project delivery.

8.3.2 Operations professional services panel

The Operations Professional Services Panel is a newly formed procurement approach specifically for projects requiring professional services (noting that design is primarily procured via the ARR Framework). It comprises of four distinct streams: project management, communications, capability, and dam safety and engineering.

Projects valued at up to $500k are directly allocated, while those exceeding this threshold engage in a competitive bidding process among up to eight suppliers, depending upon the service category. Rate cards with ceiling rates are implemented to ensure cost-effectiveness.

This procurement approach promotes efficiency by encouraging competition and ensuring that projects are awarded to the most qualified suppliers at competitive rates. The implementation of ceiling rates further facilitates cost-effectiveness by providing a structured framework for pricing negotiations, thus optimising the value obtained from the procurement of professional services.

8.3.3 Implemented initiatives

WaterNSW has implemented business improvement initiatives consistent with its strategic goal to deliver operational excellence. Several improvement initiatives were implemented throughout FY23, detailed as follows:

- **Preliminary Project Investigations** – to undertake investigations earlier to improve the prudency and efficiency of project execution. This process has commenced with the Portfolio Planning and Asset Planning teams identifying a stream of investigation projects, resourcing a multi-disciplinary Asset Investigations team, establishing workflows and undertaking the investigations. The outcome is a Preliminary Business Case with a confirmed options suite and/or a preferable solution handed over to Project Delivery for execution.
- **Governance Framework Refresh** – allowing fit-for-purpose assurance reviews that drive faster and more effective decision-making and value across the portfolio.
- **Performance Measurement & Management** – including monthly project performance reviews on programs and projects with appropriate recovery plans or re-forecasting as required. This includes the introduction of leading and lagging indicators, which includes development of earned value measurements to provide improved awareness of portfolio performance.
- **Asset Advisory Group** – firmly established in FY23, it provides strong support and advice to the team and was instrumental in supporting the acceleration of several programs. A proposal to fund the planning phase of the entire Warragamba Pipeline Corridor was endorsed by the Asset Advisory Group. The work because of this enabled acceleration of discrete civil and coating packages delivered within this determination period.

8.3.4 Initiatives in progress

In addition to implementing the aforementioned initiatives, WaterNSW have identified further opportunities for improvement. The core focus for continuing to improve project delivery performance and efficiency in FY24 is based on the following key initiatives:

- **Project Management Framework (PMF) Refresh** – to ensure a fit-for-purpose, efficient capital lifecycle process.
- **Portfolio Management Office (PMO) Development** – a new PMO that will direct, control, escalate issues and provide assurance over program and project delivery.
- **Asset Renewal and Replacement (ARR) Program Management Governance** – to provide an effective governance structure over the commercial framework to ensure performance, collaboration and value is being delivered with our partners.
- **ARR 2.0 Commercial Model –** initiatives have started to consider the performance of the current commercial model. It will consider if improvements can be made in an alternative model. The alternative model will look to increase engagement with local contractors across the state and aim to increase the amount of work allocated to smaller locally based suppliers and contractors, to drive improved efficiency.

8.4 Program schedule development

WaterNSW has developed a master schedule of all potential capital works. This was developed to inform decisions about a realistic volume of work that could be designed and constructed in FY26-30 and the WaterNSW resources required to manage the program. This is particularly important to ensure the deliverability of the large program.

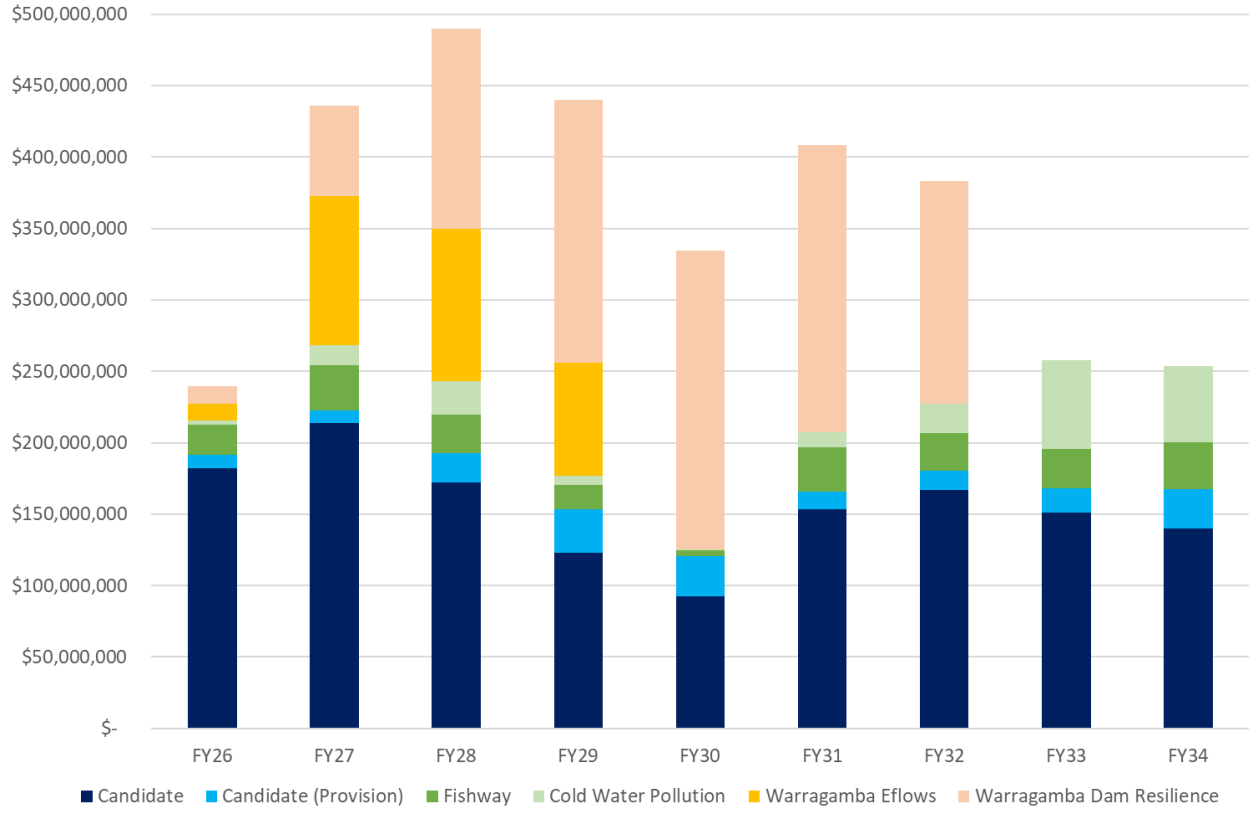
The master schedule process added a schedule-driven layer to the prioritisation process, by allowing WaterNSW to critically assess realistic timeframes to deliver individual projects based on recent experience. When reviewing the master program holistically, informed decisions were taken to defer projects of low priority or high risk of delay, or where potential constraints were identified with WaterNSW resources or market resources to manage and execute specific works.

The broad outcomes and conclusions from this schedule development were:

- Significant number of identified projects were deferred to FY31-35 or spread across the next two determination periods to ensure a manageable volume of work and manage customer price impacts. Figure 23 shows the forecast expenditure profile generated from the master schedule, which highlights identified capital works spread across the next 10 years.
- Given the capital works program value is dominated by a small number of very large projects, having some of these projects (e.g. Warragamba Dam Resilience, Warragamba E-Flows) delivered by WaterNSW's Major Projects team results in a more typical capital works program size for the remainder of WaterNSW's asset delivery teams to deliver (as can be seen in Figure 23). This arrangement was demonstrated successfully around 2019-2020 when WaterNSW's Major Projects team delivered the $500m Wentworth to Broken Hill Pipeline on-schedule and progressed multiple technical solutions and business cases for many high value, high complexity drought relief projects.
- The creation of Regional Delivery teams within WaterNSW, adds additional capacity for the business to manage the large number of small value and lower complexity renewal and replacement projects in Greater Sydney and Rural Valleys.
- Importance of efficient procurement arrangements. Given the large volume of projects, effective procurement arrangements such as those outlined in section 6.2 will be critical to ensure the required engineering, construction and other specialist services are engaged in efficient and timely manner.

- Need to accelerate investigation and technical solution development for the candidate projects. A business-as-usual approach to developing designs would constrain throughput of projects into the Execution phase. WaterNSW's early engagement of its Portion B partner to commence scope development of candidate projects in 2023 is a key approach to mitigating this risk.

Figure 23 – Forecast infrastructure capital expenditure profile from the master schedule



The process to develop the master schedule consisted of the following broad steps:

1. Capital projects considered for inclusion in the 2025 Determination period were assembled into a master program for analysis of optimal sequencing and timing of identified projects.
2. Both in-flight project and candidate projects were included in the master program. In-flight project estimates-to-complete and durations were extracted from WaterNSW's MS Project Online. Cost estimates for candidate projects were loaded against their respective phases in the master program.
3. Phase durations were then estimated for candidate projects. Profiles assigned durations for WaterNSW's P0 Investigation to P4 Completion phases. The duration of phases for each candidate project were assessed based on the project's scope complexity, planning approvals required, operational constraints limiting when works could be undertaken and the actual duration of recent similar projects.
4. Following the initial build and cost loading of the master schedule, projects were scheduled based on relative project priorities, dependencies between projects, operational constraints (e.g. needing to be executed during shutdown period) and WaterNSW resourcing constraints (e.g. Asset Delivery and Regional Delivery capacity, capping the number of projects in Planning phase at any one time, etc).
5. One of the key constraints applied was to limit the number of projects in the P0 Investigation phase at any one time. This constraint reflects the inherent limitation in the number of projects WaterNSW can design at any one time, and therefore constrained the throughput of projects which could be progressed to

construction (or P3 Execution phase). This constraint spread the delivery of projects more realistically across the 2025 Determination period and beyond, thus limiting optimism bias in the schedule.

6. The program build provided insights into the deliverability of capital program, with adjustments made to rephase or defer projects to develop an achievable capital works program. Several iterations of the program scheduling were completed to generate a deliverable program with a suitable degree of levelling of annual expenditure from FY26-30, and out to FY34.
7. In addition to deferring projects beyond FY30, some programs of work were spread over the next 2 determinations including:
    - Electrical safety program
    - Cranes safety program
    - Public safety projects
    - Physical security upgrade projects
    - Staging of Fishway projects so a smaller number are constructed in FY26-30 and the remainder designed in this determination period and constructed in FY31-34
    - Staging of Cold Water Pollution projects so a smaller number are constructed in FY26-30 and the remainder designed in this determination period and constructed in FY31-34

The program was structured so individual projects can be readily integrated into WaterNSW's MS Project Online as they are initiated, to enable long term integrated portfolio planning of in-flight and candidate projects.