IPART Independent Pricing and Regulatory Tribunal | NSW

Mamre Road Stormwater Scheme

Final Report

November 2024

Water »

Acknowledgment of Country

IPART acknowledges the Traditional Custodians of the lands where we work and live. We pay respect to Elders both past and present.

We recognise the unique cultural and spiritual relationship and celebrate the contributions of First Nations peoples.

Tribunal Members

The Tribunal members for this review are:

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The Independent Pricing and Regulatory Tribunal

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Executive Summary

Background to the Mamre Road Precinct stormwater scheme

Protecting the Wianamatta-South Creek catchment's blue grid while building a thriving Western Sydney economic centre presents a complex challenge. Waterways, riparian vegetation, wetlands, and other water-dependent ecosystems are integral to the region's environmental health. This needs to be balanced with the NSW Government's vision of balancing jobs, connectivity and liveability to create an innovation precinct and a home for technology, science and creative industries.[i] The Mamre Road industrial and commercial precinct, close to the new Nancy Bird-Walton Airport in Western Sydney, is a key part of that strategy. For a development to proceed smoothly, there needs to be basic services to support the residents, employees and businesses who will live, work and operate there. One of those services is the collection and removal of stormwater.

Stormwater that has been poorly managed can cause problems on and off site through erosion and the transportation of pollutants to downstream waterways. The NSW Government has set waterway flow and quality targets to ensure new development doesn't result in an unacceptable level of degradation. It is necessary for Sydney Water, as the regional stormwater drainage authority, to deliver fit-for-purpose stormwater management services to mitigate erosion and pollution in line with these targets.

Delivering these services comes at a cost. Infrastructure needs to be built, ongoing maintenance paid for, and the system expanded to cater for growth in the precinct.

Sydney Water has proposed a scheme based around the construction of naturalised basins along the creek.[ii] It has also proposed to construct a stormwater recycling plant to treat the stormwater captured. It will sell this recycled water to local industrial and commercial customers. It intends to recover the costs of the scheme through upfront infrastructure charges levied on the industrial developments occurring in the Mamre Road Precinct.

It is important to ensure that developers, taxpayers and customers pay only their share of the efficient costs of these services, both now and in the future.

What the NSW Government asked IPART to do

The NSW Government asked IPART to review Sydney Water's proposed stormwater scheme, and provide advice on:

- the efficient costs of providing stormwater drainage services within the Mamre Road Precinct, and
- the efficient allocation of those costs between developers, taxpayers and others.

The full terms of reference for our review are available on our webpage.

In undertaking this review, we considered the intent of the waterway health targets and the extent to which they drive scheme costs, which parties contribute to the need for stormwater services and who benefits from them. We engaged expert consultants to advise us on specific aspects of the review. These consultants are:

- Hydrology and Risk Consulting (HARC), who advised us on stormwater management, modelling and design
- WT Partnership (WTP) who provided cost-estimation advice, primarily on indicative capital and infrastructure costs.

We considered the advice and recommendations of HARC and WTP, including opportunities for cost reductions. We developed a framework for allocating costs and considered the economic impact on developers, taxpayers, customers and the broader community.

As part of our review process, we published and sought submissions first on an Issues Paper, and then a Draft Report, which set out our draft findings and recommendations. We held a Public Hearing following the release of our Draft Report, and 2 stakeholder workshops to seek views and input from interested parties.

We have considered all feedback and input from the submissions, Public Hearing and workshops. We also consulted with the Department of Climate Change, Energy, the Environment and Water, Department of Planning, Housing and Infrastructure, Design Flow stormwater consultants (engaged by the Government to advise the Technical Working Group) and Sydney Water.

Our findings and recommendations

Our report makes the following findings and recommendations on the efficient costs of providing stormwater drainage services within the Mamre Road precinct and who should pay these costs.

The efficient costs of meeting the stormwater targets are likely to be lower than those proposed by Sydney Water

We have maintained our finding that the efficient cost of delivering stormwater services over an approximate 30-year period is around $860 million in total. This includes around:

- $610 million in capital expenditure, which is around $110 million (or 16%) lower than proposed by Sydney Water
- $260 million in operating expenditure, which is around $30 million (11%) lower than proposed by Sydney Water.

These reductions are based on our assessment of an alternative concept design for the scheme identified through the Technical Working Group (TWG) (referred to in this report as the 'TWG Option'). Our analysis of the TWG Option suggests that it would be a credible path to meeting the stormwater targets at a lower cost that could have been explored earlier in the optioneering phase. Key characteristics of the TWG Option include:

- smaller but deeper stormwater basins
- fewer related civil works
- lower maintenance costs

- lower land purchase costs.

While deeper stormwater basins offer potential savings, they are dependent on relatively consistent geotechnical characteristics. The presence of widespread rock or groundwater at some of the basin sites may increase the costs of the TWG Option.

We have also included in our cost estimates the reduced quantity of land Sydney Water would need to purchase, in line with the smaller basin surface areas in the TWG Option. This may be impractical in some cases, given the nuanced complexities involved in purchasing land, and in appropriately compensating existing land holders not only for land, but severance as well. However, it is likely that Sydney Water's ongoing optioneering will identify further cost efficiencies to offset any additional compensation costs or geotechnical constraints, such as lower actual land acquisition costs.

While Sydney Water has expressed concern that if actual costs are higher and developer contributions are set too low, customers would fund the difference, the efficient costs already include a project contingency allowance. We don't consider it reasonable for developers to pay higher costs because relevant investigations and works haven't been done, as well as a contingency on top of that. We also note that in determining maximum prices for Sydney Water customers, IPART considers the efficient costs to deliver water and water-related services. It is not appropriate to assume inefficient costs will be passed on to customers.

Efficient costs should be allocated to development in the Mamre Road Precinct

Where the scheme has been designed explicitly to provide additional environmental or social services, there could be a case for allocating some of the costs of the scheme to Sydney Water customers or the NSW Government. Such services might include improved waterway health above the current baseline, additional open space, or an allowance to explicitly provide urban cooling. In such circumstances, providing these services over and above what would be needed to sustainably manage stormwater may impose additional costs driven by society generally, rather than development in the Mamre Road precinct.

We have found that the scheme is primarily designed to manage the impacts of additional stormwater loads from the development. The stormwater targets have been set to ensure that the waterway and catchment do not progressively degrade because of the development. They have not been set to improve the overall environmental or social amenity above the existing baseline. Both Sydney Water's proposed scheme and the TWG Option meet the discharge targets – and have been designed with that goal in mind.

Any additional environmental or social utility derived from the scheme appears to be incidental rather than targeted. Developers stand to benefit the most from the scheme, largely from savings from the avoided opportunity costs of having to set aside large parcels of their land for stormwater management.

Efficient costs should be recovered upfront via a developer servicing charge

Some stakeholders suggested that the infrastructure charge should be set to recover scheme capital costs, but that recurrent operating costs should be recovered from customers in the Mamre Road precinct via an annual stormwater charge.

This may be an attractive proposition for developers, who would face a lower infrastructure charge upfront. Sydney Water would still recover its efficient capital and operating costs and, assuming costs are accurately forecast, Mamre Road precinct tenants would be indifferent to whether they pay for stormwater services through an annual charge or higher rents.

However, there are several potential complexities to this approach. The charge should only apply to new industrial developments, because long-standing property owners are not driving the scheme costs. It would also require Sydney Water to levy a scheme-specific stormwater price for customers in the Mamre Road precinct. Sydney Water has not proposed this approach in its current pricing proposal that would apply from 1 July 2025, which we are currently reviewing.

We are mindful that this approach would have broader implications for developer charges in other greenfield areas. Given the growth of recycled water and need to preserve water quality in new development areas, we consider that this cost recovery option would be best considered as part of a separate review, where all these factors can be appropriately considered and consulted on. The Tribunal may consider this alternative approach when it next reviews IPART determinations for water-related Development Servicing Plans.

Given these complexities, we recommend maintaining an upfront developer stormwater charge. Under the current framework, Sydney Water and developers may enter an unregulated Negotiated Service Agreement (NSA) to provide flexibility in paying for and delivering infrastructure and services. This is a matter for Sydney Water and individual developers to negotiate. However, Sydney Water should ensure that the costs covered by the NSA are ringfenced from the broader customer base so that precinct development costs are not transferred to landowners or customers in other geographic areas.

A stormwater charge of around $850,000 per hectare is reasonable

We have maintained our recommendation that an infrastructure charge of around $850,000 per hectare is appropriate. Policy changes that occur after business decisions are made may create unexpected costs, but do not inherently justify compensation. Stormwater charges are one of the many costs of development, statutory or otherwise, representing around 5% of total development costs.[iii] In the event a subsidy was warranted, it is not clear that stormwater charges are the appropriate vehicle to provide one.

While the efficient costs of providing adequate infrastructure to meet the targets weren't accurately estimated at the time land was rezoned for development, developers would have been aware of the substantial work being undertaken, which introduced a degree of uncertainty and risk. This would have been factored into the price they paid for land at the time of purchase.

The Tribunal considers that land purchase prices do not drive forward-looking development decisions. However, given that stakeholders raised this issue, IPART undertook further discussions with stakeholders and analysis of vacant land purchase prices, holding costs and interim works - using assumptions from Atlas Economics and the Mamre Road Landowners Group. Our analysis shows that, even considering the views of these stakeholders, most developers would still find development feasible.

We also found that land sterilisation impacts were not likely to be as material as suggested in practice. There would also be no material impact on industrial land supply and demand in Greater Sydney. However, holding costs could materially affect developers' returns the longer the scheme takes to implement.

Sydney Water's proposed scheme would meet the stormwater discharge targets

Sydney Water has designed the Mamre Road stormwater scheme to meet the stormwater quality and quantity discharge targets set out in the Mamre Road Development Control Plan (DCP).[iv] Based on advice from HARC, we consider that Sydney Water's proposed scheme will meet the required stormwater discharge targets set out in the DCP.

We also found that Sydney Water's forecast costs for its proposed scheme are broadly reasonable costings for that current concept design. Sydney Water's updated estimates suggest that if this scheme were developed, the infrastructure charge would be around $1.02 million per hectare.

Water flow and quality targets are a significant cost driver

The stormwater targets for the Mamre Road precinct are more stringent than those typically required for development approval in surrounding council areas. This is to ensure that the waterway and catchment do not progressively degrade because of development. Whether it is Sydney Water, a local council or some other entity responsible for delivering stormwater services, they would need to design and implement a scheme to meet these higher targets.

Our analysis suggests that if typical council stormwater discharge targets in other catchments applied, the Mamre Road Precinct stormwater scheme could be optimised to result in an infrastructure charge of around $300,000 per hectare.[v] However, this is not a reason to lower the targets. The higher targets, set through the Government's risk-based framework and subjected to wide consultation and scientific review, are necessary to protect the waterway from continuous degradation. This is important not only for environmental, recreational and health reasons, but also downstream industries that rely on a certain level of water quality, as raised in a submission from OceanWatch Australia on the potential impacts of water quality on commercial seafood industries.[vi]

We have found that the infrastructure charge to meet these risk-based targets for the Wianamatta-South Creek would be around $850,000 per hectare, reflecting the efficient cost of developing an international airport and all its supporting infrastructure (including the Mamre Rd Precinct) within a sensitive area. Any stormwater scheme in the Mamre Road Precinct will be more expensive than in other catchments.

While previous Government estimates of the infrastructure cost of meeting stormwater targets were much lower, in the order of less than $300,000 per hectare, these are not realistic estimates. For the broader Aerotropolis, we have recommended that the Government should consider updating its strategic impact assessment under the *Risk-based Framework for Considering Waterway Health Outcomes in Strategic Land-use Planning Decisions* using revised cost estimates.

If the Western Sydney International Airport's bid under the *Commonwealth Airports (Environmental Protection) Regulations 1997 (AEPR)* seeks to apply a local water quality standard that may be less stringent than the targets for the Mamre Road and other Aerotropolis precincts, it is critical for the NSW Government to ensure that this does not undermine developers' investment in stormwater infrastructure and contribute to irreversible waterway degradation in the Wianamatta-South Creek.

Relevance to future Aerotropolis precincts

Most of our findings and recommendations relate to the Mamre Road Precinct only. Topography and location mean there are limited lessons for the design and roll-out of stormwater infrastructure in future Aerotropolis precincts.

Sydney Water is also the designated stormwater authority for 4 additional precincts within the Aerotropolis. Sydney Water and policymakers should ensure that a full range of options are assessed in the initial stages of 'optioneering' because this is critical to derive efficient solutions. Prematurely narrowing the scope of potential designs of a compliant stormwater scheme may result in inefficient outcomes and higher costs.

Delivery of stormwater infrastructure is critical. The Mamre Road precinct has been in planning for more than 5 years. We have heard from stakeholders that they are already concerned about delays. Starting construction of the stormwater infrastructure should be a priority.

The new airport is scheduled to be operational in 2026. We would anticipate that any stormwater scheme serving the wider Aerotropolis would be subject to appropriate urgency.

List of findings and recommendations

Findings

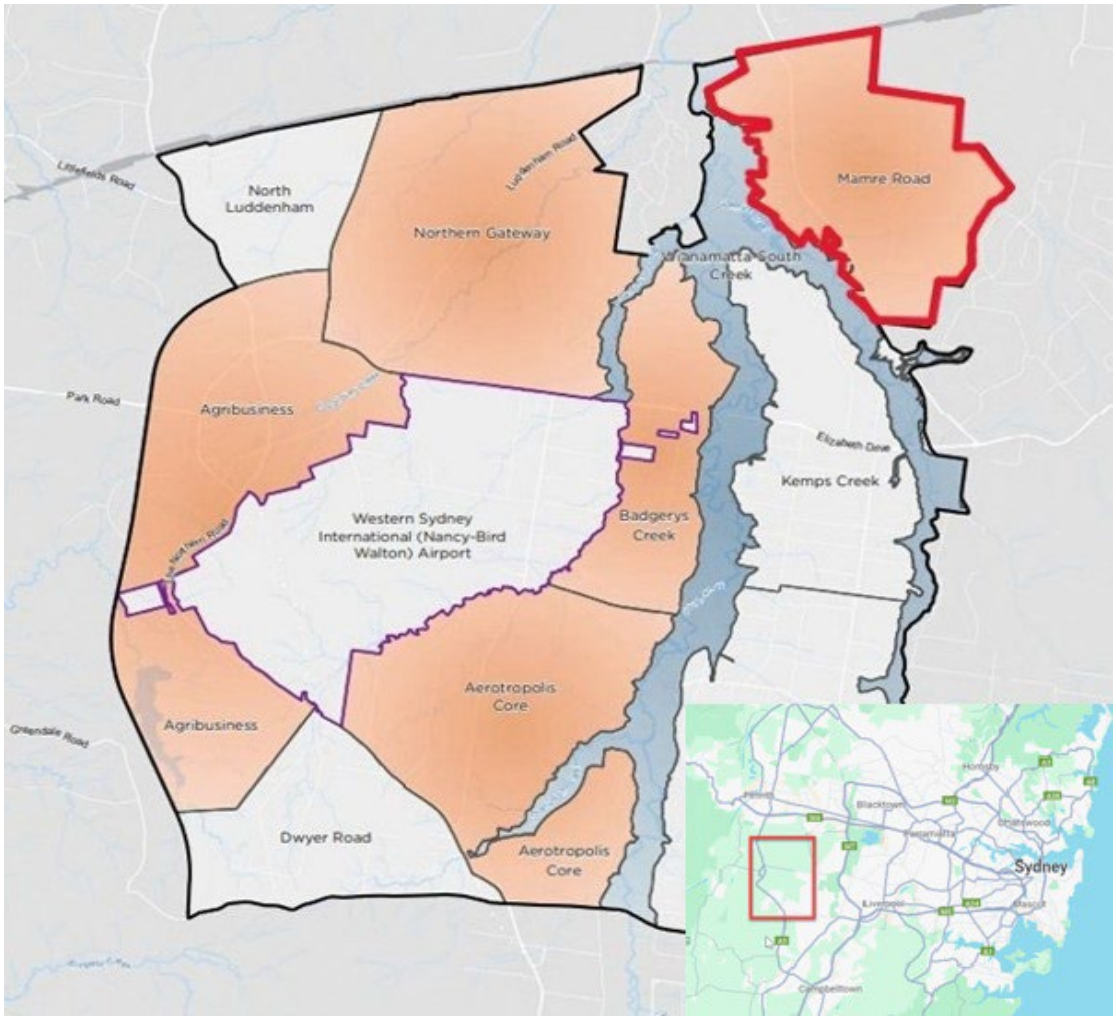
Recommendations

1 Context and approach

The Mamre Road Precinct is a new industrial area located along the Wianamatta South Creek corridor and close to the site of the new Nancy-Bird Walton Airport in Western Sydney. It is located around 40km west of the Sydney CBD and falls within the Penrith City Council local government area (see Figure 1.1).

In 2020, it was rezoned to provide around 850 hectares of industrial land, primarily catering for warehousing and logistics. The development was intended to accommodate approximately 5,200 construction jobs and 17,000 ongoing jobs when fully developed.[vii]

Figure 1.1 Map of the Western Sydney Aerotropolis showing the location of the Mamre Road Precinct



Penrith City Council is the consent authority for development in the area. Following a strategic business case by Frontier Economics to evaluate alternative models of stormwater infrastructure governance in the leading precincts in the Wianamatta-South Creek catchment (the strategic business case for stormwater governance), the Government appointed Sydney Water as the stormwater trunk drainage authority in 2022. Sydney Water is responsible for delivering, managing and maintaining a regional stormwater network in the precinct along with its drinking water, wastewater and recycled water networks.[viii]

Stormwater infrastructure is important to control rainwater runoff from hard surfaces in urban areas, such as roofs and roads, which can generate large volumes of polluted, fast-moving water that would otherwise damage sensitive waterways through introducing pollution or causing erosion.

The regional stormwater network is part of the city-shaping investment in the Western Parkland City to support and promote amenity, recreation, urban cooling and environmental outcomes. This involves conserving, investing in and actively maintaining:

- green infrastructure - such as urban canopy, open space, and
- blue infrastructure - the water-related infrastructure and stormwater management, including that provided by Sydney Water.

In most parts of Sydney, including the area surrounding the Western Sydney Aerotropolis area, stormwater is managed by councils typically using grey infrastructure such as concrete channels.

1.1 The Government's objectives for waterway health outcomes

Since European occupation, Australian landscapes and waterways have been subject to significant changes. This has led to significant degradation of waterways, especially in urban and peri-urban areas. South Creek is Western Sydney's longest urban freshwater creek and the land in the Wianamatta-South Creek catchment is the hottest, driest and least-treed area of Sydney.[ix] It has seen significant changes for over 200 years, with large areas of land cleared of native forests and vegetation for European-style agricultural practices. With the significant expansion of population and urban development in the catchment in recent decades, there has been a heightened level of concern about the impact of this increased development on waterway health.

Healthy waterways provide essential services and functions to support environmental, social and economic outcomes, including more liveable cities and healthy, resilient communities. In 2017, the former Government developed the *Risk-based Framework for Considering Waterway Health Outcomes in Strategic Land-use Planning Decisions* to guide decision-makers in determining land use planning and infrastructure to meet waterway health outcomes that reflect community environmental values and uses of waterways.[x]

Based on this framework, the Government then set stormwater management targets to achieve waterway health objectives for protecting and restoring the blue grid in the Wianamatta-South Creek catchment.[xi] These risk-based targets for Wianamatta-South Creek include options for both water quality and flow targets. They are considered standard planning requirements for stormwater infrastructure in the Mamre Road Precinct Development Control Plan, which provides planning controls for future industrial development in the Mamre Road Precinct.

1.1.1 Achieving waterway health outcomes requires stricter targets

Before the risk-based targets for the Wianamatta-South Creek were introduced, local government stormwater management targets in Sydney were based largely on reducing pollutants.

The new risk-based targets for Wianamatta-South Creek include more stringent targets for pollutant reduction as well as maintaining the total discharge volume from development (see Chapter 2). Previous flow targets only required temporary stormwater storage to reduce the peak discharge volumes. The new flow requirements constrain total discharge volumes within certain limits across the spectrum of storm discharge events. In new developments with large impervious areas, like roofs and roadways, this involves capturing, storing and re-using significant volumes of water, increasing the scope of stormwater management services.

1.2 The strategic business case for stormwater governance

Following the release of the risk-based targets for Wianamatta-South Creek, there were several optioneering efforts to identify the preferred approach to governing stormwater infrastructure to meet the risk-based targets. In 2021, the Government commissioned Frontier Economics to develop a strategic business case for stormwater governance. Frontier found that the preferred option for meeting the risk-based targets was a regional treatment and stormwater recycling scheme delivered by Sydney Water.

The strategic business case for stormwater governance incorporated advice on potential stormwater infrastructure solutions to deliver stormwater flow targets modelled by a stormwater specialist consultant, which was commissioned by the former Department of Planning, Industry and Environment to ensure:

> ... costs and benefits modelled reflect underlying stormwater infrastructure options that can deliver new stormwater flow targets.[xii]

The modelling and costs covered all the 'leading precincts' in the Aerotropolis and gave no specific breakdown of costs for the Mamre Road Precinct.

Some of the earliest estimates of costs specific to the Mamre Road precinct were published in late 2020 by Sydney Water in supporting documentation for the Mamre Road Development Control Plan. In that supporting documentation it was suggested that that the full range of water sensitive urban design measures could achieve the volume reduction objective for a notional (order of magnitude) cost of $120,000/Ha ($2019/20).[xiii]

Sydney Water undertook their own internal, integrated servicing options review, specifically for the Mamre Road Precinct. This review found that the total cost of stormwater services required to meet the risk-based targets was $231m ($2026), which included the cost of land acquisition.[xiv] This is around a quarter of Sydney Water's current cost estimates.

Following this, the former Department of Planning, Industry and Environment undertook a review of water sensitive urban design strategies for Wianamatta-South Creek.[xv] In this review, a wide range of options were considered with different combinations of on-lot vs regional treatment, including on-site rainwater harvesting and re-use vs regional stormwater harvesting and re-use. The review focused on both the expected large format industrial and high-density residential development types in the leading precincts. In this review, a key metric was the total cost per unit of net developable area. The preferred option, which involved regional stormwater harvesting and reticulated stormwater re-use, was estimated to cost $266,600 per hectare of net developable area for large format industrial precincts such as Mamre Road.[xvi] The report makes the following statement regarding cost assumptions:

> The rates have been estimated by using the most recent adopted cost rates by several local authorities, recent industry installations/construction including within Western Sydney, and industry best practice guidelines (Melbourne Water 2013; eWater 2021; Sydney Water 2021). The unit cost rates were also confirmed with the independent reviewers of this work, who represent local water and stormwater (engineer) practitioners and professionals from the urban development industry.[xvii]

These early estimates of much lower costs suggest a prevailing view that the more stringent stormwater targets could be met at much lower costs than those currently proposed.

1.3 Sydney Water's Mamre Road Precinct stormwater scheme plan

In 2021, Sydney Water published the Mamre Road Flood, Riparian Corridor and Integrated Water Cycle Management Strategy. Sydney Water's strategy details how stormwater, water, wastewater, recycled water, trunk drainage and riparian zones could be managed during construction and operation, to achieve a climate independent and sustainable water system for greening and cooling in the Mamre Road Precinct.[xviii]

Sydney Water then designed its Mamre Road stormwater scheme plan on how it intends to deliver this, estimating the required integrated stormwater infrastructure contribution at $1.3m per hectare of net developable area.[xix] This was in sharp contrast to the Government's previous estimates of $266,600 per hectare of net developable area.

In 2023, a Technical Working Group between the Government and Sydney Water, informed by a stormwater specialist consultant, was established to refine scheme costs through design review. In January 2024, the Government issued a direction to Sydney Water to cap the reasonable security required from developers to $800,000 per hectare to support timely delivery of industrial land in the precinct for development.[xx]

Since then, Sydney Water has revised its scheme design to reduce costs. Sydney Water's current estimated cost to developers of delivering the scheme is around $1.02m per hectare.[xxi]

1.4 What IPART has been asked to do

IPART is an independent strategic agency of the NSW Government, charged with regulating key markets and government services to ensure effective social, environmental and economic outcomes.

The NSW Government has asked us to provide advice on:

- determining the efficient costs of providing stormwater drainage services within the Mamre Road Precinct
- allocating these costs efficiently between developers, taxpayers, and other stakeholders.

In fulfilling this task, the Government asked us to consider:

- government policies and instruments governing land-use planning, waterway health, and environmental standards
- potential environmental, economic and social impacts of providing regional stormwater drainage services in Mamre Road Precinct compared to alternate pathways
- comparative costs of stormwater drainage schemes in Greater Sydney and other cities
- the impact of land tax and other taxes and options for funding these costs.[xxii]

This report contains our advice on what the level of efficient cost for Sydney Water's stormwater scheme should be and how those costs should be allocated.

1.5 Our approach to this review

1.5.1 Determining the efficient costs of providing stormwater services

Sydney Water's stormwater scheme must meet the stormwater management targets set out in the Mamre Road Precinct Development Control Plan. In meeting these targets, Sydney Water must have regard to the water sensitive urban design strategies advocated in the 'Review of water sensitive urban design strategies for Wianamatta-South Creek' and 'Technical guidance for achieving Wianamatta-South Creek stormwater management targets'.

We reviewed Sydney Water's conceptual stormwater scheme design to determine whether the proposed scheme:

- complies with the guidelines and meets the stormwater management targets that apply
- delivers stormwater management services at an efficient cost
- could deliver stormwater services in a more cost-effective way.

We engaged Hydrology and Risk Consulting (HARC) to review Sydney Water's conceptual design and compare it to the Technical Working Group's alternative design for the Northwestern and Eastern sub-catchment clusters using Model for Urban Stormwater Improvement Conceptualisation (MUSIC) models.

We engaged WT Partnership Australia (WTP) quantity surveyors to provide advice on the reasonableness of both Sydney Water's and Technical Working Group's capital cost estimates, compared with projects with a similar development stage, market conditions and potential for cost efficiencies.

We also considered the extent to which meeting the Mamre Road Precinct stormwater targets contributes to costs, compared to meeting targets in neighbouring Penrith City Council areas.

1.5.2 Cost allocation between developers, taxpayers and others

IPART generally advocates allocating costs to parties according to their contribution to the cost being incurred. However, where there is not a clear nexus between the service and payee, we may consider what benefits the service provides and who accrues these benefits. Where the cost drivers or beneficiaries can't be easily identified or charged, some portion of costs may need to be recovered from customers or taxpayers.

Applying the framework to this review, we considered:

- which stormwater services (and therefore costs) are driven by new development and which, if any, are driven by other Government objectives that are intended to benefit a broader community
- who benefits from these services and how feasible it is for Sydney Water to recover costs from these parties
- the financial impact on the identified parties, including what impact it would have on the economic viability of development in the precinct.

A key consideration is whether the stormwater management targets intend to substantially improve the Wianamatta-South Creek condition above the steady state levels that would occur with no new development.

We also considered who should pay land tax and for interim works that are necessary for development prior to the roll out of the regional stormwater scheme.

1.5.3 How stakeholder feedback has informed our findings and recommendations

Our findings and recommendations have been informed by stakeholder submissions and feedback at our stakeholder workshops, Public Hearing advice from our stormwater and cost consultants and our own analysis.

To better understand the key issues and their impact on stakeholders, we sought written submissions on an Issues Paper in April 2024 and held 2 workshops with the Tribunal in June 2024. We sought further written submissions on a Draft Report in September 2024 and held a Public Hearing in October 2024. We consulted with the Department of Climate Change, Energy, the Environment and Water, Department of Planning, Housing and Infrastructure, Design Flow stormwater consultants (engaged by the Department of Climate Change, Energy, the Environment and Water to advise the Technical Working Group) and Sydney Water.

1.6 How this report is structured

The following chapters discuss our analysis, findings and recommendations on the efficient costs of Sydney Water's stormwater scheme and how those costs should be allocated among developers, taxpayers and others.

- Chapter 2 discusses the stormwater management targets, their role in shaping the scheme, how they drive costs and how they compare to other areas within Greater Sydney and other cities
- Chapter 3 reviews Sydney Water's stormwater scheme design and the Technical Working Group alternative option and potential optimisations to reduce costs
- Chapter 4 examines the costs of delivering Sydney Water's stormwater scheme and the Technical Working Group's alternative option
- Chapter 5 sets out our cost allocation framework, recommends what contribution developers, taxpayers and others should make towards the efficient costs and how this should be recovered
- Chapter 6 considers how our cost allocation recommendations impact developers, taxpayers and others, including the impact on development viability in the precinct and broader impacts on industrial land supply and demand and the Government's growth priorities for Western Sydney.

2 Stormwater management targets

Sydney Water's stormwater scheme must meet the stormwater management targets in the Mamre Road Precinct Development Control Plan. In developing its scheme, Sydney Water must also consider the NSW Government's policy objectives for water sensitive urban design, outlined in its *Technical guidance for achieving Wianamatta-South Creek stormwater management targets.*

This chapter considers how these targets and guidelines affect Sydney Water's scheme costs, compared to the costs of providing stormwater services that would meet the standard local government targets that apply in neighbouring areas. It considers the how the targets were developed, including whether they were designed to realise broader benefits to the community that may warrant a contribution to costs from other parties.

2.1 Our findings and recommendations on the stormwater targets

The risk-based stormwater targets that apply to the Mamre Road Precinct are much stricter than standard local government targets in the Sydney Metropolitan area, requiring lower discharge volumes, phosphorus, nitrogen and other pollutants. This is a significant cost driver resulting in Sydney Water's proposed stormwater infrastructure charges being around 3.5 times higher than what developers would pay in neighbouring areas.[xxiii]

However, the targets are necessary to prevent irreversible damage to the sensitive Wianamatta-South Creek and its ecosystems, ensuring altered stormwater flows from expected land use changes don't push the waterway past its 'tipping point'. Applying standard local government targets could lead to severe degradation including biodiversity loss, erosion and reduced water quality.

Meeting the targets is likely to generate water quality improvements over time, leading to conditions where ecosystems could re-generate and riparian vegetation re-planting could be sustained. We consider these benefits are incidental, generated from implementing strategies to mitigate stormwater runoff from new development in the first instance.

The former Department of Planning, Industry and Environment (now Department of Climate Change, Energy, the Environment and Water) developed the targets following the Government's *Risk-based Framework for Considering Waterway Health Outcomes in Strategic Land-use Planning Decisions.* This involved scientific analysis and consultation with water managers, land-use planners and the broader community over 4 years to set appropriate objectives and tipping points for waterway health.

While there were some data limitations and stakeholder concerns about transparency, we consider the process that was followed, including information sharing and consultation, was appropriate. However, since similar stormwater targets are likely to apply to the broader Aerotropolis and early cost estimates to meet these targets in the Mamre Rd precinct have proven too low, we recommend that the Government considers updating its strategic impact assessment under the risk-based framework.

Given the importance of meeting the targets and the investment in stormwater management by developers in the Mamre Road precinct, the NSW Government should work with the Federal Government and Western Sydney International Airport to ensure that the airport's stormwater discharge does not contribute to irreversible waterway degradation in Wianamatta-South Creek.

2.2 How the stormwater targets are relevant to our review

Our terms of reference do not ask us to review and provide advice on the stormwater targets themselves, but asks us to consider various policy instruments that shaped the development of the waterway health objectives and targets and government policy on how to achieve them.

In its submission to our Draft Report, the Mamre Road Landowners Group asked us to undertake a transparent technical peer review of the data and modelling regarding the stormwater management targets.[xxiv] This was echoed by other stakeholders at our Public Hearing, who stated that IPART should conduct "an in-depth analysis of the model and the originating data… to understand whether the targets are appropriate".[xxv]

Re-evaluating the targets is beyond our scope under our terms of reference, because they are largely driven by the science of what's necessary to prevent degradation to the Wianamatta-South Creek in line with Government policy objectives. These objectives and targets were developed over 4 years by the former Government, with input from scientific analysis, community engagement, and expert peer review. However, consistent with our terms of reference, we have reviewed the relevant policy documents to understand how the targets were developed within the risk-based framework, and how they affect scheme costs.

2.3 How the stormwater targets compare to those in other areas

In response to our Issues Paper, some stakeholders raised concerns that the Mamre Road Precinct targets are a step change from what has been adopted in NSW to date and have resulted in a requirement for large scale, inefficient and unaffordable infrastructure.[xxvi] In particular, the Mamre Road Landowners Group expressed concerns that the 90th percentile flow control results in "interim measures, significant sterilisation of land and infeasible scheme design costs".[xxvii]

2.3.1 The Mamre Road Precinct stormwater targets are stricter than other local government targets

The stormwater targets for the Mamre Road Precinct are stricter than those that apply in neighbouring local government areas. They require higher levels of water treatment to manage pollutants such as nitrogen, phosphorus and sediment. These targets also include more detailed requirements for mitigating water flow to reduce volumes and prevent erosion in the Wianamatta-South Creek.

The Wianamatta-South Creek catchment spans 8 local government areas, including Penrith City Council, where the Mamre Road Precinct is located, and the adjacent Blacktown area. These both house similar industrial developments immediately to the north and east of the Mamre Road Precinct.

Both Blacktown Council and Penrith City Council have guidelines for flow and nutrient management that apply to new developments. Along with the Mamre Road Precinct targets, these are compared with the EPA Victoria targets introduced in 2021 in Table 2.1.

Table 2.1 Comparison of water quality and flow targets in different jurisdictions

Parameter	Mamre Road Precinct	Penrith City Council	Blacktown City Council	EPA Victoria
Total Gross Pollutant[a]	90% reduction	90% reduction	90% reduction	N/A
Total Suspended Solids (TSS)[a]	90% reduction	85% reduction	85% reduction	80% reduction
Total Phosphorus (TP)[a]	80% reduction	60% reduction	65% reduction	45% reduction
Total Nitrogen (TN)[a]	65% reduction	45% reduction	45% reduction	45% reduction
Free Oils and Grease	No release of oil, litter or waste contaminants	90% reduction	N/A	N/A
Total hydrocarbons	N/A	N/A	90% reduction	N/A
Litter	No release of oil, litter or waste contaminants	N/A	N/A	70% reduction
Flow	Mean Annual Runoff Volume ≤2 ML/Ha/year at the point of discharge to the local waterway	Post development no greater than 3.5 times pre-development.	Deemed to comply: • Full bioretention on-lot to meet the water quality targets. • A rainwater tank that supplies a minimum of 80% non-potable demand. Or: • Post development no greater than 3.5 times pre-development.	Requirements for harvesting and or infiltration as a % of mean annual runoff depending on rainfall band and priority of receiving waterway.

a. Based on annual load reduction.

Source: NSW Department of Planning, Industry and Environment, *Mamre Road Precinct Development Control Plan*, November 2021, p 18; Penrith City Council, 2014; Blacktown City Council, 2020; EPA Victoria, 2021.

The Mamre Road Precinct targets include more detailed requirements for flow control (see Table 2.2).

Table 2.2 Mamre Road precinct development flow targets (operational phase)

Parameter	Option 1 – Mean Annual Runoff Volume (MARV)		Option 2 – Flow duration curve approach	
	Target	**Flow objective for 1st and 2nd order streams**	**Target**	**Flow objective for 1st and 2nd order streams**
Mean Annual Runoff Volume (MARV)	≤2 ML/ha/y at the point of discharge to the local waterway	1.90–2.14 ML/ha/y	N/A	N/A
95% percentile flow	N/A	N/A	3,000–15,000 L/Ha/day at the point of discharge to the local waterway	N/A
90% percentile flow	1,000–5,000 L/Ha/day at the point of discharge to the local waterway	1,309–2,788 L/Ha/day	1,000–5,000 L/Ha/day at the point of discharge to the local waterway	1,309–2,788 L/Ha/day
75% percentile flow	N/A	N/A	100–1,000 L/Ha/day at the point of discharge to the local waterway	327–2,048 L/Ha/day
50% percentile flow	5–100 L/Ha/day at the point of discharge to the local waterway	50–94 L/Ha/day	5–100 L/Ha/day at the point of discharge to the local waterway	50–94 L/Ha/day
10% percentile flow	0 L/Ha/day at the point of discharge to the local waterway	2–39% cease to flow	N/A	N/A
Cease to flow	N/A	N/A	Cease to flow to be between 10% and 30% of the time	2–39%

Source: NSW Department of Planning, Industry and Environment, *Mamre Road Precinct Development Control Plan 2021*, November 2021, p 19.

2.3.2 The cost of meeting the Mamre Road Precinct targets is significantly higher

The water flow and quality targets are a significant driver of stormwater management costs. Our stormwater consultants HARC developed a design option that would meet the standard local government targets that would apply to neighbouring Penrith City Council developments. Based on the results of our cost consultant, we determined that the stormwater infrastructure to meet these targets would cost significantly less than Sydney Water's Mamre Road stormwater scheme at around $200,000 per hectare.[xxviii]

Although stakeholders claimed that the 90th percentile flow target is the main cost driver[xxix], HARC's MUSIC modelling indicates that the MARV primarily determines the harvesting pond size, not the 90th percentile flow target. The results are very close to the MARV threshold, but comfortably within the upper and lower flow ranges that are set for the 90th percentile.

However, this doesn't justify lowering the Mamre Road Precinct targets. The higher costs result from the extra works required to mitigate industrial development in a sensitive waterway catchment. The standard 'business-as-usual' targets that apply in neighbouring areas are not suited to manage the stormwater impacts from this level of large format industrial development with vast impervious surfaces and would fail to protect the waterway, potentially leading to severe degradation, biodiversity loss, erosion and poorer water quality.

2.3.3 There are differences in the way Melbourne Water has approached waterway health targets

At the Public Hearing, some stakeholders stated that they found Melbourne Water's approach to setting targets preferable because it:

- considers the waterway as 5 major waterway catchments and 69 sub-catchments, each with distinct physical, environmental and social economic characteristics
- sets targets based on sub-catchment traits, allowing wider water courses to accept larger flows and narrower ones to have stricter limits
- costs around $10 - $30 per square metre versus $85 to $100 in the Mamre Road precinct
- developed targets collaboratively over 6 years with over 36 workshops involving industry professionals, academics and engineers.[xxx]

The Melbourne Water approach to stormwater targets is documented in its *Urban stormwater management guidelines*.[xxxi] We have examined the high-level differences between the Melbourne Water and NSW approach, which are:

- Water quality and flow standards: Melbourne Water sets discharge standards based on current condition of the waterway, classifying waterways as 'priority' (for healthy waterways) or "other" (for degraded ones). In contrast, Wianamatta-South Creek targets apply uniformly across the catchment, with no classification adjustment.
- SFAIRP principle: Melbourne Water's targets operate under the 'So Far as is Reasonably Possible' (SFAIRP) principle, which allows for relaxed standards if infrastructure necessary to meet the targets proves infeasible and/or too costly.

Broadly, Melbourne Water's priority areas align with greenfield development sites around Melbourne that drain to freshwater waterways. DCCEEW has advised that it consulted with Melbourne Water around its approach to setting targets and determined that the approach taken by Melbourne Water with respect to flow targets is very similar to that utilised within the Wianamatta-South Creek area. [xxxii] DCCEEW further advised that, based on the flow targets that Melbourne Water applies to these areas and assuming a 700mm rainfall (which is like what is assumed for Western Sydney), runoff must be reduced by 79%, which would result in a MARV of around 1-1.5ML/Ha/year.[xxxiii]

Without having undertaken a full evaluation of streams in Wianamatta-South Creek, our high-level view is that if a similar approach applied to the Wianamatta-South Creek, it may only be the upper and undeveloped reaches that would fall under 'priority' classification. Discharge points for Mamre Road into Kemps Creek and Ropes Creek could potentially fall under 'other'. Under Melbourne Water's approach, a higher MARV (4ML/Ha/year) would then apply to the more degraded areas in South Creek. Melbourne Water's guidelines indicate that allowing flows of up to 4ML/Ha/year would be sufficient to prevent further degradation to these areas – like the Wianamatta-South Creek target of 2ML/Ha/year.

We also note that the Melbourne Water MARV reductions apply only to pervious areas of the catchment. In the case of the Mamre Road precinct (which is around 64% impervious based on HARC's MUSIC modelling), it would be around 2.2 to 2.6 ML/Ha/year, not 1-1.5ML/Ha/year.

The SFAIRP principle may help explain Melbourne Water's lower scheme costs. A Sydney Water review by Alluvium consultants of the Melbourne Water schemes' implementation, and feedback from Melbourne-based HARC staff, found no examples of stormwater schemes in Melbourne using extensive stormwater recycling like that required for Mamre Road to meet the targets.[xxxiv]

In comparing the frameworks, the SFAIRP principle in Melbourne Water's guidelines serves a similar function to the strategic impact assessment in Step 4 of the *Risk-based Framework for Considering Waterway Health Outcomes in Strategic Land-use Planning Decisions*, albeit being able to be applied later in the planning and design process.

Findings

1. The stormwater management targets for the Mamre Road Precinct are stricter and more expensive to meet than the typical local government targets that apply in neighbouring areas and those set by Melbourne Water.

2. Melbourne Water's stormwater targets likely cost less to meet because they may tailor them based on current waterway condition and allow targets to be relaxed if infrastructure to meet them is infeasible or too costly.

2.4 Purpose and application of the targets

Stakeholders at our workshops raised concerns that the stormwater targets provide broader community benefits that should result in lower costs for developers or adjustments to Sydney Water's rate of return.[xxxv]

We sought further information from the Department of Climate Change, Energy, the Environment and Water about how the targets were developed and the original intent. We considered whether they were designed to realise broader benefits to the community that could warrant a contribution to costs from other parties.

2.4.1 Broader benefits from meeting the targets are incidental

The stormwater targets are one strategy to achieve the waterway health objectives of protecting and restoring the Wianamatta-South Creek, in line with the Government's vision for a 'cool, green' Western Parkland City. They also provide a level of protection for the ecosystems and aquaculture in the Hawkesbury River, for which Wianamatta-South Creek is a significant tributary. The Department of Climate Change, Energy, the Environment and Water considers compliance met when water quality concentrations in stormwater flows from the treatment train are at or below the water quality objectives.

We considered what 'protect and restore' means in this context and concluded that while the targets help reduce pollutants and help improve the creek's condition over time, restoration is incidental, not the primary goal. The targets are primarily designed to ensure that altered stormwater flows from changes in land use don't result in increased erosion and waterway pollution. While some degradation may still occur compared to a pre-development state, the targets prevent the waterway reaching a tipping point where recovery is no longer possible, even with remediation.

2.4.2 Application of the targets to the catchment is appropriate

The Mamre Road Landowners Group raised concerns that the MARV target of 2 ML/Ha/y is based on that for ≥3rd order streams, while the flow targets at different percentiles are based on those for 1st and 2nd order streams.[xxxvi]

We consider that this reflects a misunderstanding of precinct development in the greater catchment context. Precincts are typically developed in areas drained by trunk stormwater drainage systems located in 1st and 2nd order stream areas, which discharge into ≥3rd order streams. It is appropriate to use MARV targets for 3rd order streams. The MARV associated with 1st and 2nd order streams is far stricter.

When examining the flow-duration curve percentiles, the ≥3rd order streams into which the precinct discharges also have significant catchments upstream of the point of discharge. It would be inappropriate to apply these very large flow volumes to the discharges from much smaller precinct catchments. Our view is that the use of different stream order criteria for the MARV and flow duration curve percentiles is appropriate.

2.5 Process to develop the targets

Some stakeholders questioned the process used to develop the targets and lack of industry consultation and peer review. Barings stated:

> the Stormwater Targets were developed by a Brisbane-based civil engineer with support from a local ecologist. There has been limited information shared to industry on the assumptions which informed the waterway health targets. The targets were not peer reviewed and no engagement with industry occurred during its development…[xxxvii]

Some stakeholders claimed water quality targets are based on a single monitoring site, which may not represent the broader catchment.[xxxviii] The Mamre Road Landowners Group also stated that they have unsuccessfully requested access to data and the establishment of a technical working group with Government, including Mamre Road Landowners Group representatives and their expert consultants, to review data behind the targets.[xxxix]

We sought further information from the Department of Climate Change, Energy, the Environment and Water about how they developed the targets and what consultation they undertook.

2.5.1 The former Department of Planning, Industry and Environment followed a reasonable risk-based process to develop the targets

The Department of Climate Change, Energy, the Environment and Water (as the former Department of Planning, Industry and Environment) followed the Government's *Risk-based Framework for Considering Waterway Health Outcomes in Strategic Land-use Planning Decisions* to determine the appropriate targets. This involved mapping the natural blue grid, identifying community values and uses and setting water quality and flow objectives. They then assessed the relationship between water flow and habitat indicators and converted these objectives into specific targets. They conducted a strategic impact assessment, including consulting local councils on 16 water sensitive urban design strategies to achieve the targets.

As part of this process, the Department of Climate Change, Energy, the Environment and Water advised that they:

- conducted field observations of vegetation and fauna at various sites throughout the catchment
- monitored water flows at 6 gauging stations (5 of which provided good data records) to assess the hydrological changes resulting from land-use pressures in the upstream drainage area/sub-catchment, and cross-check modelled stream flow data from Sydney Water
- reviewed water quality data from 4 undisturbed monitoring sites.[xl]

Despite extensive monitoring in the Wianamatta-South Creek over many years, only one site was deemed suitable for setting discharge standards. Other sites were unsuitable because of:

- limited data and specific weather conditions during monitoring
- high upstream development leading to poor water quality.[xli]

We found that the water quality at the chosen site was assessed alongside 3 other reference sites (albeit deemed unsuitable by the Government) and compared with the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (which are much stricter than those at the chosen site).[xlii]

Given the limited data available, the use of this reference site appears reasonable. We consider DCCEEW's advice to be credible and we have found that the process used to develop the targets was appropriate.

2.5.2 The Government's consultation process was appropriate

As part of the process of developing the waterway health objectives and targets, the Department of Climate Change, Energy, the Environment and Water advised that they:

- conducted online market research with paid participants and used geolocated pinpoints to allocate community values and uses with 11,500 participants across NSW
- consulted 100 local and state waterway managers in 2021 and 2022 through 14 workshops that were hosted across NSW
- consulted subject matter experts from state and local governments, industry practitioners and academia
- held regular meetings with developers, including the Mamre Road Landowners Group, to keep them informed throughout the process.[xliii]

In its submission to our Draft Report, the Mamre Road Landowners Group expressed concerns about the level of consultation that the Government has had with developers, including that:

> … a draft Terms of Reference for a technical working group was provided to Industry by DPHI in December 2023. However, we understand this technical working group was cancelled without explanation at the request of the BCS.[xliv]

We understand that DCCEEW and DPHI raised concerns around the roles and responsibilities of third parties, such as Sydney Water and developers, in the technical working group due to potential or perceived conflicts of interest. DCCEEW noted that the performance criteria and targets are supported by a robust and peer-reviewed scientific evidence base, and any innovations proposed by the group should be subject to the same rigorous evaluation process including peer review.[xlv]

2.5.3 The Government has published data underlying the targets on its SEED website and various publications

DCCEEW advised us that, consistent with their scientific data-sharing policy, most relevant target-related data is either available on the Government's Sharing and Enabling Environmental Data (SEED) portal or has been published in other publications including:

- Mapping the natural blue grid elements of Wianamatta-South Creek
- Performance criteria for protecting and improving the blue grid in the Wianamatta-South Creek catchment
- Review of water sensitive urban design strategies for Wianamatta-South Creek targets
- Wianamatta–South Creek stormwater management targets
- Technical guidance for achieving Wianamatta-South Creek stormwater targets.[xlvi]

The SEED database contains datasets and supporting documents including:

- High ecological value waterways and water dependent ecosystems in Wianamatta-South Creek
- MUSIC Modelling Toolkit Wianamatta-South Creek

- The Western Sydney salinity and soils landscapes mapping for the Penrith 1:100,000.

In November 2023, the former Department of Planning responded to an information request by developers in the Mamre Road Landowners Group, stating that they were unable to provide:

- the calibrated model developed by DesignFlow referred to in the Wianamatta-South Creek stormwater management targets, and
- details of the Rapid Riparian Assessments for the sections of Kemps Creek, Wianamatta-South Creek and Ropes Creek adjacent to the Mamre Road precinct.

because the intellectual property or licence for these models and assessments was owned by a third party, not the Government.[xlvii]

However, they provided links to relevant modelling methodologies, assumptions and data including:

- process, parameters and numbers to use in the MUSIC modelling, which are included in the Government's *Risk-based Framework for Considering Waterway Health Outcomes in Strategic Land-use Planning Decisions*
- soil sampling results on the Government's eSpade website.[xlviii]

Findings

3. The main purpose of the targets is to manage stormwater runoff from land-use changes that stem from large format industrial development in the precinct. Waterway improvements and other benefits that result from the targets being met are incidental.

4. The process used to develop the risk-based Wianamatta–South Creek stormwater management targets was appropriate.

2.6 Impact of the targets on the broader Aerotropolis

2.6.1 Waterway health outcomes risk not being met if Western Sydney International (WSI) airport faces lower targets

In its submission to our Draft Report, the Mamre Road Landowners Group raised concerns that under the *Commonwealth Airports (Environmental Protection) Regulations 1997 (AEPR)*:

> ... WSI intends to apply for an appropriate local water quality standard for the nearby creek systems based on this preexisting water quality.[xlix]

They considered that if approved, this may result in higher costs for surrounding precincts to meet the stormwater targets than for the WSI itself.

WSI is in the vicinity of the Cosgrove, Badgerys and Duncans Creeks. WSI claims that these creeks have poor water quality due to pre-existing local topography, geology, climatic conditions and historical land use within their respective catchments. Because water quality at the airport site is already degraded and does not meet existing water quality criteria, WSI claims that they would be unlikely to achieve existing water quality criteria outlined in the AEPR.[l]

If approved, WSI's application may allow it to meet a less stringent water quality target than other Aerotropolis developers. This could result in developers paying to meet stricter standards, while the WSI discharges lower quality runoff reducing creek quality. Given that targets are set at tipping point limits, this is likely to cause the waterways to degrade beyond recovery over time.

DCCEEW advised us that they are aware of the policy complexities in integrating a Federal facility on Commonwealth land within an NSW environmental landscape. They have advised us that they have sought further information from the Federal Government on the WSI's intention.[li]

The waterway flow and quality outcomes in Wianamatta-South Creek could be undermined by development in neighbouring regions, potentially leading to further degradation of the waterway. To preserve the value of the investment in stormwater infrastructure by developers in the Mamre Road precinct, the NSW Government should work with the Federal Government and WSI to implement a framework where the airport's stormwater discharge does not contribute to irreversible waterway degradation in Wianamatta-South Creek.

2.6.2 The Government should consider the feasibility of the targets in the broader Aerotropolis

Some stakeholders recommended that there should be a review of the current waterway targets or a revised feasibility assessment.[lii]

Step 4 in the NSW Government *Risk-based Framework for Considering Waterway Health Outcomes in Strategic Land Use Planning Decisions* is a Strategic Impact Assessment that ensures that the selected management responses are reasonable, practical and cost-effective.[liii]

As we have noted elsewhere in this report, early cost estimates of meeting the targets were not realistic. These costs were much lower than what we have found to be the actual efficient costs.

Given that similar stormwater management costs are likely to apply to the remaining Aerotropolis precincts, it would be pragmatic for the Government to consider updating the strategic impact assessment based on these costs. This is particularly important if the WSI is permitted to operate under alternative stormwater discharge settings.

Finding

5. The waterway flow and quality outcomes in the Wianamatta-South Creek could be undermined by development in neighbouring regions, potentially leading to further degradation of the waterway.

Recommendations

1. To preserve the value of the investment in stormwater infrastructure by developers in the Mamre Road precinct, the NSW Government should work with the Federal Government and Western Sydney International Airport to ensure that the airport's stormwater discharge does not cause irreversible waterway degradation in the Wianamatta-South Creek.

2. The NSW Government should consider updating the strategic impact assessment under Step 4 of the *Risk-based Framework for Considering Waterway Health Outcomes in Strategic Land Use Planning Decisions* for the broader Aerotropolis using revised stormwater infrastructure costs.

3 Sydney Water's stormwater scheme design

Establishing the efficient costs of delivering stormwater drainage services ensures developers, taxpayers and customers only pay what is necessary to deliver and operate these services. To inform our view on these costs, we considered the process Sydney Water undertook to develop its stormwater scheme including its key assumptions.

We engaged Hydrology and Risk Consulting (HARC) to review Sydney Water's conceptual design and compare it to the Technical Working Group's alternative design (TWG Option) for the Northwestern and Eastern sub-catchments using Model for Urban Stormwater Improvement Conceptualisation (MUSIC) models. HARC has updated its report to address stakeholder comments, including several questions and comments from Sydney Water in its submission to our Draft Report. HARC's updated report is available on our website.

This chapter considers whether Sydney Water's preferred scheme is developed consistent with the Government's water sensitive urban design guidelines and whether it meets the stormwater targets. It compares it with the Technical Working Group's alternative design and considers the main cost drivers and opportunities to reduce these. It examines whether alternatives proposed in response to our Draft Report would be cheaper and considers stakeholders concerns about safety risks associated with a deeper basin design.

3.1 Our findings and recommendations on the stormwater scheme design

We have found that the stormwater treatment, storage and recycling systems Sydney Water has proposed are designed to meet the risk-based water quality and flow targets. In addition, the parameters governing runoff and pollutant loads Sydney Water has used in its MUSIC model are consistent with industry standards for water sensitive urban design (WSUD).

The requirement to remove water with the use of storage and recycled water systems adds significant costs to the scheme. More stringent water quality targets also result in a greater than proportional increase in the size of treatment systems, which also adds to the costs of the scheme.

The size of the recycled water storage ponds is determined by the expected demand for recycled water. Sydney Water's earlier recycled water demand forecasts were subject to a large amount of uncertainty. However, we found that the final forecasts used in the Sydney Water design are reasonable. Nonetheless, we consider that Sydney Water could improve the accuracy of recycled water demand forecasts for future large format industrial development areas.

While some stakeholders suggested that on-lot storage such as rainwater tanks could reduce the size and cost of these recycled water storage ponds, we have found that this is not the case. It would require properties to establish very large tanks, which would consume substantial land area, and this would only reduce run off by 25%. Further, we note that they have a high risk of failure over time if they are not maintained properly.

Given the long lead-in times and other uncertainties, using the Kemps Creek Dam as a storage for recycled stormwater is unlikely to be a viable option for the Mamre Road Precinct.

3.2 Sydney Water's stormwater scheme design

In March 2023, Sydney Water released its design and costing of the stormwater scheme. This was, and still is, the first development of a conceptual design for the purposes of setting stormwater infrastructure development charges under the new risk-based targets for Wianamatta-South Creek.

The current Sydney Water stormwater management scheme is comprised of stormwater collection, treatment, storage over 5 clusters of sub-catchments and a recycled water treatment and distribution network.

The design is dependent on the modelling undertaken using the MUSIC model. This model simulates the flow and pollutants resulting from storm events and the removal of pollutants from treatment systems. The extraction of stormwater from storage ponds for recycling is also simulated.

The volumes of runoff and pollutants are governed by assumptions in the model about the areas of the catchment that are impervious (such as roads and roofs) and the potential for different land uses to generate different levels of pollutant loads.

In response to our Draft Report, Icon Oceania stated:

> The design proposed by Sydney Water, as it currently stands, has been critiqued by several developers, including Icon Oceania, for being overly conservative and resulting in inflated costs. A reduction in basin sizes and simpler stormwater designs could meet the necessary environmental requirements while significantly lowering costs.[liv]

Apart from some minor issues identified in the development of the design, the parameters governing runoff and pollutant loads used by Sydney Water in their MUSIC model are industry standard.

While our Draft Report recommended that Sydney Water improve its optioneering and design processes to reduce costs, we acknowledge that Sydney Water is operating in a difficult design environment and faces unique design challenges, including:

- the need to capture and remove large volumes of water from the rainfall-runoff environment to meet discharge flow targets
- the limited low-cost land available upon which to position stormwater management facilities
- the need to design 'low profile' treatment systems that do not adversely impact on floodwater flows or floodplain storage.

With the re-zoning of land primarily governed by the flood extents, there is little room available for the infrastructure. This is particularly noticeable in the East and South-West catchment clusters, where the need to squeeze large areas of infrastructure in the small available land areas creates additional costs associated with land severance.

For future precincts, it may be beneficial for Sydney Water to consider the need for land for stormwater infrastructure above floodplains and adjacent to water bodies in the re-zoning process.

Overall, our finding is that the treatment and storage and stormwater recycling systems would meet the risk-based water quality and flow targets.

Findings

6. The stormwater treatment, storage and recycling systems proposed by Sydney Water would meet the risk-based water quality and flow targets.

7. The parameters governing runoff and pollutant loads used by Sydney Water in their Model for Urban Stormwater Improvement Conceptualisation (MUSIC) Large Format Industrial model are consistent with industry standards for water sensitive urban design.

3.3 On-lot rainwater tanks would not be a cheaper alternative

At the Public Hearing, some stakeholders proposed on-lot storage as a more efficient way to meet the targets. However, this option was reviewed in strategic planning stages and found to be too expensive. We considered documentation on a design including rainwater storage tanks, which demonstrated that very large tanks, consuming substantial land area, would only reduce run off by 25%, necessitating regional retention ponds as well.

In its submission, Sydney Water stated:

> On-lot solutions have been shown in numerous studies and cost benefit analyses to result in unacceptable risk of failure and higher economic cost, including sterilisation of developable land due to the required footprint of on-lot stormwater infrastructure.[iv]

Sydney Water's business case compared the regional scheme against a business-as-usual option, relying on on-lot detention, finding the regional scheme more efficient.[1]

Finding

8. On-lot rainwater tanks are not a credible alternative to regional storage basins.

[1] Sydney Water's Final Business Case is not publicly available. However, Sydney Water shared these documents with IPART for the purpose of our review.

3.4 Recycled water demands

Stormwater harvesting and re-use is critical to the scheme design, because water must be removed from the system to meet the targets and can't just be stored and released slowly back into the system.

The demand for recycled water is a critically important parameter in the development of the Mamre Road stormwater management infrastructure. The higher the demand for water, the sooner space is created in storage ponds for additional capture and hence the size of storage ponds is reduced. It is important to note that there are no existing large format industrial sites like the Mamre Road Precinct in the Sydney Water service area that are supplied with recycled water.

Recycled water demand estimates for the Mamre Road Precinct have typically been generated by estimating the volume of water used on-lot (assumed to be 50% of the normal potable use) and then adding additional demands for the irrigation of other precinct areas such as on-lot and off-lot planting areas, open space and Non-Revenue Water (NRW). The assumption of 50% of on-lot use being non-potable is based on Sydney Water's records of non-residential customer water consumption in recycled water service areas. While these areas are not exclusively large format industrial, we consider that this is a reasonable assumption in the absence of better information.

Demand estimates utilised in the Review of water sensitive urban design strategies for Wianamatta–South Creek[lvi] were generated using an 'average frequency' analysis of water use from Sydney Water's industrial customers normalised for lot area. This analysis resulted in estimates of on-lot total demand of 12.5 kL/Ha/day and recycled water demand of 6.25 kL/Ha/day.

It should be noted that the 'average frequency' analysis used to generate this demand estimate is not an accepted statistical analysis technique and will not provide an unbiased estimate of the expected water consumption. We do not support the ongoing use of average frequency analysis when estimating water demand. A simple averaging of water consumption per unit lot area would give the appropriate estimate. We note it was discontinued during the evolution of the demand forecasts and so has had no material impact on the final demand estimates.

The frequency distributions used do correctly highlight the wide variance in water use intensity on large format industrial sites across Sydney and the difficulty in generating reliable estimates of water demand for the Mamre Road Precinct.

The water demand estimates were subsequently refined over the design process, with the final on-lot estimates being based on 50% of the average demands from similarly sized large format industrial lots supplied with potable water. Additional demand has been added for additional irrigation (on-lot and off-lot) plus non-revenue water. The estimation of NRW has not used a correct formula, although the impact of this error is minor.

We have found that the final demand estimate is reasonable, despite the minor error in the NRW calculation.

The resulting water demands are much lower than those used in the original review of water sensitive urban design strategies. This may go some way in explaining the significant differences in the sizing of storage ponds and scheme costs between the original conceptual layouts and those finally adopted by Sydney Water.

Given the dependency of the sizing of recycled stormwater storage ponds on the level of water demand, there are strong incentives to improve the forecasts of water demand for future large format industrial development areas.

Findings

9. A significant proportion of scheme costs is dependent on the size of the recycled water storage ponds, which are dependent on the demand for recycled water.

10. Sydney Water's initial recycled water demands were subject to significant uncertainty. However, the final recycled water demands Sydney Water used in its stormwater scheme design are reasonable.

Recommendation

3. Sydney Water should review its method of forecasting recycled water demand for future large format industrial development areas in the broader Aerotropolis.

3.5 The additional cost of meeting the risk-based targets

The new risk-based targets for Wianamatta-South Creek require the installation of additional pollutant removal infrastructure, and the infrastructure required for the interception and storage of treated stormwater for use in a recycled stormwater system. In addition, more stringent water quality targets result in a greater than proportional increase in the size of treatment systems. Due to the periodic nature of stormwater availability, this recycled water scheme requires a connection to a backup source of water, which is in this case the Upper South Creek Advanced Wastewater Recycling Plant.

To test the cost impacts of meeting these more stringent targets, IPART engaged a stormwater consultant, HARC, to develop conceptual layouts for 2 of the 5 Mamre Road Precinct clusters of sub-catchments based on meeting typical council targets. WTP considered the efficient costs of providing this conceptual layout and found that it would cost around 78% less than Sydney Water's current stormwater scheme design, largely because of the reduced area required for treatment systems.[lvii] If the results in these 2 sub-catchment clusters are extrapolated across the entire Mamre Road Precinct, we estimate that the resulting stormwater infrastructure charge would be around 70% less than Sydney Water's stormwater infrastructure charge.[lviii]

Finding

11. Stricter water quality targets require a greater than proportional increase in the size of treatment systems, which adds to the costs of the scheme.

12. The requirement to remove water from the system through storage and recycled water systems adds significant costs to the scheme.

3.6 The use of the Kemp's Creek Dam

One of the Technical Working Group's findings was that Sydney Water should explore the viability of using the existing Kemps Creek Dam as it's stormwater recycling storage pond. To do this, the dam would need to be either:

- re-engineered to create an off-stream storage, or
- used as an on-stream storage, with upstream flows captured and re-used, offsetting the increased discharges from the Mamre Road Precinct.

As it is currently configured, the Kemps Creek Dam is clearly an on-stream storage. With its extensive embankments the current dam occupies a significant part of the original floodplain, and the outlet has been engineered to divert discharges into an adjacent creek. There would be significant challenges presented by either option, including:

- the transfer of the asset from the original owner to Sydney Water, and
- the current and ongoing integrity and stability of the dam structure.

Addressing these challenges would take a significant amount of time. The current urgency of implementing a stormwater management scheme for the precinct means that the use of the Kemps Creek Dam as part of the stormwater management scheme is not likely to be feasible and we have not considered this option further.

Finding

13. Given the urgent project time frames, the potential use of the Kemps Creek Dam as a storage for recycled stormwater is not a pragmatic option at this stage.

4 Efficient costs of Sydney Water's stormwater scheme

We reviewed the costs of Sydney Water's stormwater scheme design and the Technical Working Group's alternative and determined whether they were reasonable compared to projects of similar stage and risk. We engaged WTP Australia (WTP) quantity surveyors to independently review Sydney Water scheme costs as presented in their final business case for the Mamre Road Precinct - Integrated Water Management.

This chapter considers whether Sydney Water's stormwater scheme costs are reasonable and whether the TWG Option offers a lower cost way of meeting the targets.

4.1 Our findings and recommendations on efficient costs

The Mamre Road Precinct stormwater management scheme is the first to be designed to meet the new Wianamatta-South Creek risk-based targets. In hindsight, the former Department of Planning and Sydney Water's early estimates of the cost to deliver stormwater management services have proven to be significantly lower than what is required to meet the targets.[lix]

Since its release of the first conceptual design, Sydney Water has made significant reductions in costs through design improvements. We have found that the cost estimates prepared by Sydney Water for their current concept design are reasonable, compared with a project of similar stage and risk profile. In addition, Sydney Water has employed an appropriate methodology in estimating costs for land acquisition and a contingency for this cost.

However, we maintain our finding that, based on our review of a single, alternative option developed for the Government's joint Technical Working Group, it is possible to achieve material cost savings through design efficiencies, including stormwater treatment trains and using deeper storage ponds.

The exact amount of these costs savings would depend on the outcomes of geotechnical and ground water investigations, land take reduction and the feasibility of extrapolating these savings to other sub-catchments. However, we disagree with Sydney Water's position that these cost savings should not be factored into developer service charges because they have not undertaken or completed the necessary investigations and works to realise them. While some portion of these cost savings may not eventuate as anticipated, it is likely that as Sydney Water progresses its technical optioneering, it would find other cost savings. For example, actual land acquisition costs may be lower than forecast.

Overall, we maintain that the stormwater infrastructure charge could be reduced to approximately $850,000 per hectare.

4.2 Independent review of Sydney Water's stormwater scheme costs

Our cost consultant, WTP, reviewed Sydney Water's stormwater scheme costs to assess the reasonableness, considering the inherent uncertainties in projects at a similar stage of development, market conditions, and the potential for cost efficiencies. The review did not include land acquisition costs.

The review has the following variance from Sydney Water's Final Business Case costs:

- direct costs are 2% lower
- indirect costs are 3% higher
- contractor margin is 21% higher
- contract contingency including margin (P50 - Base) is 21% higher
- SWC contingency at P50 is 39% higher and at P90 is 12% lower
- Total Project Cost at P50 is 5% higher and at P90 is 1% lower.[lx]

WTP's report is available on our website. Given the conceptual design used for costing, we conclude that Sydney Water's costs are reasonable, compared to projects of a similar stage and risk profile.

Finding

14. Sydney Water's cost estimates for their current concept design are reasonable compared to comparable projects at a similar stage and risk profile.

4.3 Independent review of Technical Working Group alternative

In late 2023, in response to the high initial estimate of the stormwater developer servicing charge, a joint Government-Sydney Water Technical Working Group was initiated to provide independent review and a forum for identifying and discussing opportunities for the optimisation of the scheme. The former Department of Planning, Industry and Environment engaged a stormwater management consultant to review the Sydney Water design and suggest improvements. Refinements that Sydney Water has made following this process means they have been able to reduce the developer infrastructure contribution from $1.3m per hectare to $1.02m per hectare.[lxi]

To demonstrate the potential for additional cost savings, the stormwater management consultant HARC developed alternative designs for 2 of the 5 clusters of sub-catchments in the precinct. The key difference from Sydney Water's design is reduced basin areas and increased depth, which results in a more cost-efficient design and land acquisition savings.

WTP's cost review of these alternative designs found that costs of the stormwater treatment and storage component of the collection, treatment and recycling system would be around 29% less than Sydney Water's design.[lxii] If this is extrapolated to all 5 sub-catchment clusters, it could result in a further 14% reduction in infrastructure costs.[lxiii] However, this is contingent on further investigation to determine the feasibility and refine the excavation costs required for deeper basins.

These findings demonstrate that it could be possible to achieve substantial cost savings through additional optimisation of the design.

4.3.1 Deeper stormwater basins do not pose substantial additional safety risks

One stakeholder expressed concern that open channel stormwater paths and increased pond depth could pose additional risks to the health and safety of the public and livestock, due to stagnant water and mosquitos.[lxiv]

From a water safety perspective, if ponds are designed appropriately to facilitate easy exit, there is likely to be little difference in a pond that is 2 or 3 metres in depth. All water bodies present a safety hazard for vulnerable individuals and measures need to be in place to manage that hazard effectively.

Sydney Water notes that maximum pond depths that can be incorporated without introducing additional safety risks are generally:

- 3 metres for small ponds or in areas with high geotechnical risk
- 4 metres for large ponds or those located within IN1 land, to minimise land take.

Sydney Water stated that its infrastructure is built in compliance with relevant safety standards and in a manner which minimises the risk to the public.[lxv]

4.3.2 Developers should not have to fund larger basins for aesthetic reasons

In response to our proposal that Sydney Water could adopt deeper ponds as outlined in the TWG design, Penrith City Council stated:

> If the recommended redesign necessitates securing/fencing off the basins for safety reasons, this will impact the ability of stormwater and open space assets to be effectively integrated and would not achieve an appealing public domain.[lxvi]

The primary purpose of the basins is stormwater retention. We consider that developers should not bear significant additional costs to make basins aesthetically pleasing for public spaces. Any public amenity should be incidental unless funded through another source. We maintain our finding that deepening basins and reducing land footprint would be an appropriate trade-off between cost and preserving amenity.

Finding

15. It could be possible to achieve substantial cost savings through better optioneering, including more efficient design of stormwater treatment trains and use of deeper storage basins.

Recommendation

4. Sydney Water should review its stormwater optioneering for the broader Aerotropolis to identify the most cost-effective stormwater solution at an earlier design stage.

4.4 Land acquisition costs

One of the key project costs is land acquisition. In our Draft Report, we found that land acquisition cost savings could be made through having smaller, deeper basins.

4.4.1 Land severance compensation costs may reduce basin cost efficiencies

In its submission to our Draft Report, Sydney Water estimated that cost savings from optimising basin sizes (from reduced land intake and associated land tax) are more likely to be in the order of 6-10%, rather than 17%, which we estimated in our Draft Report.[lxvii] Sydney Water considered that:

> Reducing the basin footprint does not necessarily result in a proportional reduction of land acquisition and associated costs at each site. Land severance and the application of the *Land Acquisition (Just Terms Compensation) Act 1991* need to be considered.[lxviii]

Landowners are entitled to compensation for loss of access or use from severance. This means "…the amount of any reduction in the market value of any other land of the person entitled to compensation which is caused by that other land being severed from other land of that person."[lxix] This addresses loss of land use because of changes such as reduced access or restricted future development, and ensures the landowner is fairly compensated for diminished use or worth of remaining land.

Several residential landowners raised concerns about land fragmentation, irregular and land-locked parcels and site isolation.[lxx]

Although it is ultimately a legal issue for Sydney Water to determine to what extent land acquisition has caused severance, we acknowledge that it could have an impact on realisable cost efficiencies. We note, however, that where landowners already experience restricted access to land parcels because of their floodplain designation and natural waterways crossing their land, this would be unlikely to constitute severance.

4.4.2 Sydney Water's land acquisition costs may be lower than forecast

Sydney Water's actual land acquisition costs could be lower than projected, potentially offsetting severance expenses.

In its submission, the Mamre Road Landowners Group indicated that Sydney Water should also consider stormwater charges and related costs in its land acquisition forecasts, which could lower the estimated costs.[lxxi]

Sydney Water must pay landowners market rates for acquired land to ensure compensation on just terms as per the *Land Acquisition (Just Terms Compensation) Act 1991*. Sydney Water engaged 2 property valuation consultants to provide advice on forecast land values and indexation. Based on their advice, Sydney Water adopted a market rate for IN1 developable land of $650 per square metre ($2023-24) with annual indexing of CPI + 4% each year.[lxxii] Following our Draft Report, we requested further information from Sydney Water on its land valuation approach.

We have focused our analysis on IN1 land because it represents the most valuable land category. While it constitutes about 14% of the land Sydney Water expects to acquire, it accounts for over 55% of the costs, assuming Sydney Water acquires only land necessary for basin and wetlands, and nearly 90% if full lots are acquired.[lxxiii]

If Sydney Water's property valuation consultants factored in current estimates of stormwater charges, this would already be reflected in its recommended land market values. However, this does not seem to be the case. The consultants relied primarily on a review of recent comparable sales, which have been limited since March 2023. One consultant based its market valuation advice on just 5 IN1 sales in and outside of the precinct, including one subdivided property. In both reports, the consultants found that actual average sales of comparator properties were in the order of $250 to $405 per square metre. It is not clear how they concluded that an indicative average land value of $650 was therefore appropriate.

Our analysis of historical purchase prices in the Mamre Road precinct returns a much lower average price per square metre (see Table 4.1). We grouped sales in 3 time periods – between the airport announcement and when land was rezoned IN1 in June 2020, after land was rezoned until stormwater charges were known in March 2023 and since March 2023.

Table 4.1 Average industrial property purchase prices in the precinct

Years	Price per square metre ($/m²)	Properties sold (no.)
2015-2020	$215	13
2020-2023	$348	39
2023 - present	$485	8

Source: IPART analysis of Land Valuer General data.

It is difficult to determine what impact higher stormwater charges would have on land market rates because it depends on several factors, including zoning and supply and demand for industrial land in Sydney. Timing of land acquisition is also important as the value of land increases over time.

While we have found Sydney Water's process to forecast land acquisition costs to be appropriate, we consider that the market rates they have relied on appear to be overly conservative. It is likely that the cost to Sydney Water of acquiring IN1 land in the precinct for stormwater works would be lower.

4.4.3 Landowners will receive market value compensation for land acquired

Several residential landowners in the precinct have raised concerns that stormwater charges may reduce the compensation they receive from Sydney Water for land acquisition. M. Loader's (individual) submission to our Draft Report (which was supported by several other stakeholders) stated:

> The adoption of this inflated cost scheme will negatively affect the residual land values in the property acquisition process in the order of between 6.4% to 10.6%.[lxxiv]

It also stated:

> We recommend that the basis of these costs be made explicit, reflecting market values or current land use costs to ensure the scheme has adopted fair compensation values for the Affected Landowners.[lxxv]

Under the *Land Acquisition (Just Terms Compensation) Act 1991*, landowners are entitled to the market value of their land at the acquisition date. Market value reflects the price a willing buyer would pay a willing seller for that land ignoring:

- value changes due to the public project requiring acquisition
- increases from state improvements for the project before acquisition
- increases from use of land in a manner or purpose contrary to law.[lxxvi]

Our review does not set the land acquisition prices. However, we recognise that stormwater charges and related development costs may affect what developers would pay, in turn affecting market values. However, as noted above, this is one of several factors affecting market values and it is difficult to determine the exact value at the time of acquisition.

Finding

16. It is likely that any severance compensation Sydney Water may have to pay would be associated with lower land acquisition costs at the time of acquisition.

4.5 Land tax

As a state owned-corporation, Sydney Water is liable to pay land tax on land that it acquires for the purpose of delivering stormwater services. In its submission to our Issues Paper, Sydney Water noted that land tax, as an ongoing expense, is a significant driver of costs over the lifetime of the scheme. It estimated the net present value of land tax at around $140m over the period (or 14% of costs).[lxxvii]

Some stakeholders have suggested that developers should not have to pay land tax costs. In its submission to our Issues Paper, the Mamre Road Landowners Group considered that land tax should be exempt from Sydney Water's Development Servicing Charge.[lxxviii]

4.5.1 Land tax is a material and statutory cost of development

Based on the efficient costs of the TWG Option, we estimate that land tax would reduce to around $110 million.[lxxix] This is still around the same proportion of total costs.

We note that Sydney Water had discussions with NSW Treasury and the former Department of Planning about alternative funding arrangements for land tax or zoning of developable land to constrained after acquisition on the basis that managers of similar schemes (local councils), are not subject to land tax on land used to deliver stormwater infrastructure.[lxxx] This could lead to a downwards revaluation and potentially a land tax saving. In November 2023, IPART issued a letter of comfort to Sydney Water that we would be unlikely to adjust the regulatory asset base to reflect any land devaluation post-rezoning if the asset was efficiently purchased and still delivering services. In the absence of an exemption, land tax remains a statutory cost for Sydney Water.

4.5.2 There are no distortions arising from a perceived lack of competitive neutrality

Local council stormwater drainage service providers do not have to pay land tax. While recognising that different entities that provide the same services may be subject to different tax arrangements, it is not a breach of competitive neutrality policy.

Competitive neutrality policy in NSW is aimed at ensuring that government owned businesses do not gain an unfair competitive advantage over private sector businesses simply because they are government owned. Government owned businesses, like Sydney Water, are required to price their goods and services to fully reflect their costs, including a commercial rate of return on capital employed and to pay taxes and tax equivalents.

Sydney Water's stormwater drainage services were declared a monopoly service under the *Independent Pricing and Regulatory Tribunal (Water, Sewerage and Drainage Services) Order 1997* because there were no alternative providers.[lxxxi] Therefore, there is no competitive disadvantage between government and non-government entities, because there are no potential alternative providers.

The Government appoints stormwater drainage authorities. This decision is based on a range of environmental and social outcomes related to government policy, in addition to cost effectiveness. From a cost effectiveness perspective, land tax is considered a transfer. This means that its impact on a cost-benefit analysis is neutral and would not be a criteria over which government would consider in its cost comparison of different options. In the context of Mamre Road, Sydney Water was selected as the scheme administrator due to the advantages of a regional scheme and the lower capital and land requirements compared to a council managed approach.

4.5.3 Land tax should be funded in the same way as other efficient costs

Land tax is a statutory cost associated with acquiring and holding land for the purposes of delivering stormwater. It reflects the opportunity cost of holding and using land for stormwater provision, relative to its next best use (i.e. developable land). As a cost that Sydney Water faces, it must be included in Sydney Water's cost base and recovered in the same fashion as all other efficient scheme costs.

Developers own the land holdings that would be subject to land tax in their next best use. In the absence of a regional scheme, developers would have to provide on-lot stormwater infrastructure to retain and treat runoff and would be liable to pay land tax on these land holdings for this purpose. This would indicate that if the service were to be provided in a different way, the same resource allocation principles would apply as in a regional scheme managed by Sydney Water.

Developers are in the best position to manage the tax impact on themselves. Land tax provides incentives for landowners to use land in its most productive capacity, as any increase in contributions rates on developable land would be reflected in the underlying land value.

Finding

17. Land tax is a material, but statutory cost that Sydney Water incurs to deliver the scheme and should be funded in the same way as other efficient costs.

4.6 Contingency costs

In its submission, Icon Oceania stated:

> It was noted in the IPART Public Hearing on 15/10/2024 that the cost of $850,000 per hectare include contingency and operational maintenance costs. The contingency proposed in the draft IPART report is 36% and the operational costs are significant. It was [suggested by a stakeholder in the Public Hearing] that if the contingency and the operational costs are removed, the costs for the DSP reduce to approximately $400,000 per hectare.[lxxxii]

We consider that efficient contingency costs are appropriate to include in forecast costs. They are standard and, if effectively set, represent the typical outturn costs accounting for scope and cost uncertainties.

The consultant we hired to advise us on cost-estimation has recommended reducing Sydney Water's direct contingencies, which we did in developing our recommendation on efficient costs. We do not consider that excluding contingencies is appropriate in this case.

Finding

18. Sydney Water has employed an appropriate and robust methodology in setting costs for land acquisition and a contingency for this cost.

4.7 Cost differences compared to early conceptual layouts

As discussed in Chapter 2, the current Sydney Water stormwater scheme design cost is significantly higher than the costs estimated when the early conceptual layouts were developed for the Strategic Business Case.

In its submission, the Mamre Road Landowners Group queried why the NSW Government's early assessment of $287k/ha and why Sydney Water's estimate of $120k/ha to comply at an estate level are significantly lower than the current proposed DSP charge.

Factors contributing to this include:

- the additional cost imposed by land tax on forecast land acquisitions by Sydney Water to deliver the necessary infrastructure for the scheme
- the much lower water demands than those assumed in the development of the early conceptual layouts leading to much larger storage pond sizes in Sydney Water's design
- some refinements to the understanding of land uses.

The early conceptual layouts and costings, developed as part of the review of water sensitive design strategies for Wianamatta-South Creek, utilised estimates of recycled water demand that were based on erroneous water demand analysis by Sydney Water. It is reasonable to assume that these early water demands (approximately double the current demands) were a significant contributing factor in the much lower estimates of infrastructure costs in that earlier stage of the project.

However, there are still significant differences in costs that cannot be explained alone by these factors. This points to a potential failure in the early optioneering and conceptual development phases of the project to apply realistic cost estimates. This has had the effect of sending vastly inaccurate price signals to developers about the true costs of developing land in the Mamre Road Precinct. While the IPART is not able to speculate on the specific causes of this potential failure, we recommend that the agencies involved in this early optioneering review their processes and communications.

We also consider that the process of developing risk-based targets should not be undertaken without due consideration of the potential trade-offs between environmental goals and the cost of meeting those goals.

Finding

19. In hindsight, the former Department of Planning and Sydney Water's early stormwater infrastructure cost estimates have proven to be too low, sending inaccurate signals of the true cost of developing the Mamre Road Precinct to developers.

5 Cost allocation

The second part of our terms of reference asks us to provide advice on how efficient stormwater scheme costs should be recovered from developers, taxpayers and others, such as water customers.

In this chapter, we explain our cost allocation framework and how we have applied it to determine the appropriate cost allocation between developers, taxpayers and other parties. As part of this, we also consider who should fund land tax and the cost of interim on-lot stormwater works required for development to begin before the regional stormwater scheme is rolled out.

5.1 Our findings and recommendations on cost allocation

Developers are the primary driver of stormwater impacts in new developments because development increases impervious surfaces, leading to greater runoff and environmental degradation. Therefore, they should primarily fund stormwater management infrastructure.

Our cost allocation framework finds no rationale for taxpayer contributions to these costs. While the broader community benefits from improved water quality, urban cooling and less pollution, these benefits arise incidentally to managing stormwater runoff and are not the primary cost drivers. They are also small relative to developers' savings on land holding and stormwater infrastructure costs, that they would incur if they had to provide on-lot stormwater management themselves.

There may be some merit in stakeholders' proposals to have a lower upfront developer charge and recover operating costs from tenants or asset owners via recurrent annual stormwater charges. We have not consulted on setting scheme-specific stormwater charges as part of this review. It would also have implications for the maximum prices that Sydney Water can charge customers to provide services from 1 July 2025. Sydney Water's current price proposal does not include any provisions for recovering these recurrent operating costs from specific customer groups. Instead, it opts for a 'postage stamp' pricing approach, spreading costs across the entire customer base, which would be unsuitable for covering expenses tied to new developments in specific geographic locations.[2]

As a result, we recommend maintaining an upfront developer stormwater charge of around $850,000 per hectare. We will further examine cost recovery mechanisms, considering the growth of recycled water and need to preserve water quality in greenfield areas. If warranted, we may recommend a separate review on this topic. The Tribunal may consider this alternative approach when it next reviews IPART determinations for water-related Development Servicing Plans.

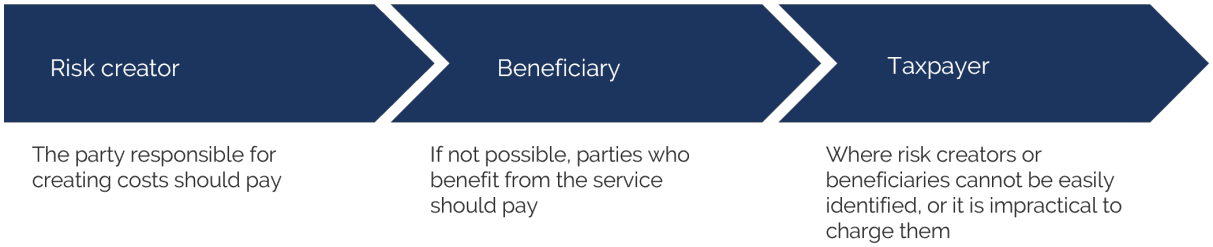
[2] Where ongoing costs are proposed to be recovered through postage-stamp pricing, it is important that developers pay an upfront charge that includes operating costs. This helps promote efficient price signals for developers and protects existing customers from bearing the costs of high-cost schemes.

In the meantime, the existing framework allows for Sydney Water and developers to enter unregulated Negotiated Service Agreements (NSAs) to provide flexibility in paying for and delivering infrastructure and services. This is a matter for Sydney Water and individual developers to negotiate. However, Sydney Water should ensure that the costs covered by NSAs are ringfenced from the broader customer base, so that precinct development costs are not transferred to landowners or customers in other geographic areas.

5.2 Cost allocation framework

When considering who should pay for new infrastructure or services, IPART's precedent is to use the funding hierarchy in Figure 5.1. This hierarchy prioritises recovering costs from 'risk creators' in the first instance, meaning the parties who trigger the need for the services. If cost recovery from the risk creators is not possible, then beneficiaries of those services should pay. If it is not possible or practical to charge either the risk creators or beneficiaries, costs would fall to the Government as the funder of last resort. We have applied these principles as the basis for our cost recovery recommendations in this review.

Figure 5.1 Cost allocation hierarchy



5.3 Nexus between stormwater infrastructure and development

There is a clear nexus between the need for stormwater infrastructure and development. Developers, as the primary drivers of urban development, increase the proportion of impervious surfaces like roads, rooftops and pavements, which prevent rainwater from infiltrating the ground. This results in increased runoff, which can cause pollution, erosion and harm to sensitive ecosystems in the Wianamatta-South Creek catchment.

The creek's sensitivity to increased stormwater flows makes stormwater management critical. To maintain the current conditions of the waterway, runoff from planned development would need to be reduced by around 75%, which requires specific stormwater management solutions.[lxxxiii] Developers are therefore the main risk creators and there is a strong case for them to fund the costs of necessary stormwater solutions in the first instance.

5.4 Beneficiaries of the scheme

The waterway health objectives for the Mamre Road Precinct reflect community values, integrating waterways, riparian corridors and water dependent ecosystems as essential parts of the Aerotropolis design. Many of these outcomes reflect non-market benefits, which don't have a direct market value or price, but still provide value to society. These include:

1. Waterway quality — protecting and maintaining waterway quality from further degradation arising from development, benefiting local ecology and community wellbeing.
2. Carbon sequestration and air quality — increased tree biomass helps reduce emissions and improve air quality.
3. Urban cooling — a blue/green grid promotes improved liveability and hence, improved health and productivity.
4. Reduced Warragamba Dam reliance — a recycled water system could decrease reliance on dam water, benefiting broader Sydney Water Customers as well.

Our view is that developers should not be expected to pay for costs that exceed their own impacts. If stormwater targets aim to materially improve waterway health beyond its current state, the community, as beneficiaries, are a driver of some portion of the costs and should contribute to funding them.

Figure 5.2 below shows that while the waterway is already below its natural or 'pre-development' state because of historical development, new development would further degrade it, requiring stormwater infrastructure to manage this impact. Costs to offset this development impact would be borne by developers. There may be some incidental community benefits that also arise from meeting the targets. However, if the scheme's aim is to materially improve the waterway to a higher state than its current state, then these costs could be substantial compared to mitigating development impact (Figure 5.3). We consider that these should be allocated to the community (taxpayers).

Figure 5.2 Scheme principally designed to address development impacts

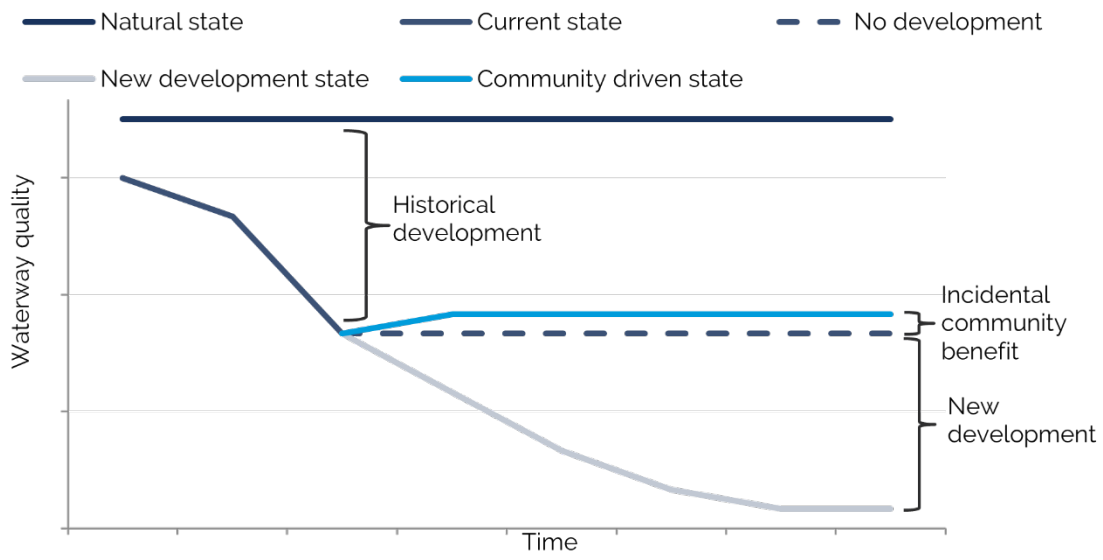
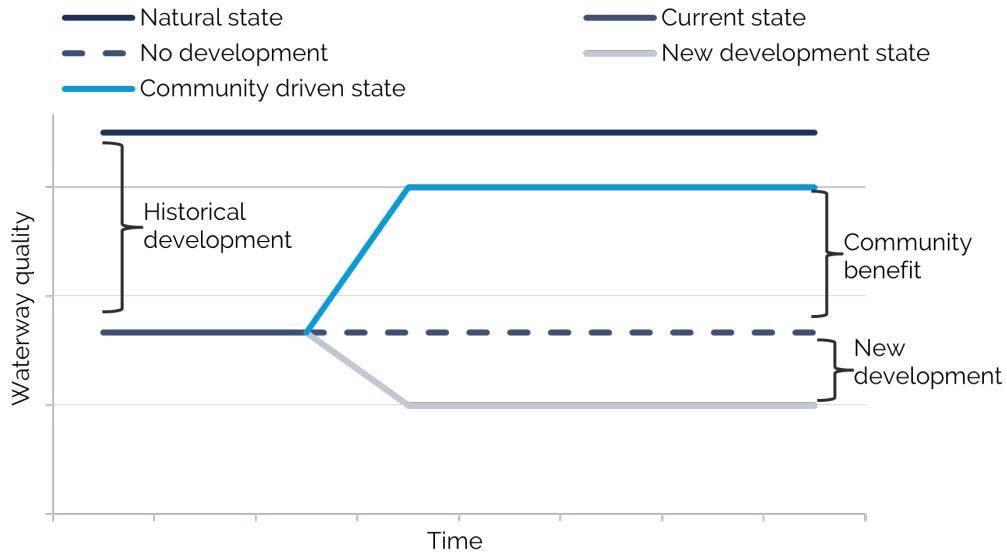


Figure 5.3 Scheme designed to improve the waterway above current state



5.4.1 Community benefits are largely incidental

We have found that Figure 5.2 better reflects the scheme's cost drivers. As discussed in Chapter 2, the waterway targets are designed to prevent the waterway reaching a tipping point, after which very high environmental costs would arise. Under typical stormwater targets that have previously applied, new development would likely push the waterway past this tipping point. Because of this, the scheme has been principally designed to avoid exceeding the tipping point and any community benefits that arise are largely incidental.

As part of our analysis, we considered Sydney Water's final business case[lxxxiv,3] for the stormwater scheme. Sydney Water's Final Business Case assesses the capital and operating costs of 3 options for delivering the stormwater solution over about 34 years:

1. Base case: On-lot stormwater management without recycled water, meeting 80% of non-potable water demand from on-lot storage and treatment of water. Ongoing maintenance of infrastructure is by property owners.
2. Option 2: Semi-integrated water cycle management approach without recycled water top up. The scheme includes a recycled water (purple pipe) network for stormwater recycling with a potable water 'top up' connection for periods when stormwater is not available. Scheme is managed by Sydney Water as the regional stormwater authority.
3. Option 3 (Sydney Water's preferred option[4]): Full integrated water cycle management approach with recycled water 'top up' from the Upper South Creek Advanced Water Recycling Centre when stormwater is not available. Scheme is managed by Sydney Water as the regional stormwater authority.[lxxxv]

[3] Sydney Water's Final Business Case is not publicly available. However, Sydney Water shared these documents with IPART for the purpose of our review.

[4] This is the option on which Sydney Water's current costings are based.

While Sydney Water chose Option 3 as its preferred option, it found all options offered similar non-market (community) benefits like waterway quality and carbon sequestration and air pollution removal.[lxxxvi] The net present value of the additional avoided local cooling, productivity and health costs offered by Option 3 was $15m over around 34 years, because of natural urban cooling effects from stormwater irrigated greenery.[5, lxxxvii]

Market benefits of avoided potable water augmentations and pumping costs are driven by the scheme itself, rather than the waterway targets. However, they also arise as an incidental benefit because of the way the stormwater runoff is managed.

Finding

20. The stormwater scheme may incidentally deliver non-market benefits, such as improved waterway quality, carbon sequestration, air pollution removal and avoided local cooling costs. It is developers who are driving those incidental non-market benefits and they, rather than the community, should be required to pay for them.

5.4.2 Developers benefit the most from the scheme

In the absence of Sydney Water's regional stormwater scheme, developers must meet the stormwater targets via detaining and treating stormwater runoff on their own properties. Meeting the targets is critical to prevent the Wianamatta-South Creek from reaching the tipping point, regardless of how it is done. The Mamre Road Precinct Development Control Plan sets out requirements for new industrial developments, including drainage strategy and landscaping and biodiversity controls.[lxxxviii] The costs to developers of doing this include:

- Capital costs: Installing infrastructure like drainage paths, pipes, culverts, retaining walls, and vegetation to manage stormwater.[lxxxix]
- Opportunity costs of land sterilisation: Developers must reserve land for stormwater detention, limiting the portion available for revenue-generating development.

We considered the outcomes of Sydney Water's Final Business Case and found:

- the net present value of recoverable project costs is $209 million, representing the capital developers would need for on-site infrastructure
- the net present value of additional developer costs, mainly from land sterilisation, is around $2,412 million, because of the amount of land reserved for stormwater management
- the net present value of total costs is around $2,621 million.

Based on Sydney Water's costs of the regional scheme:

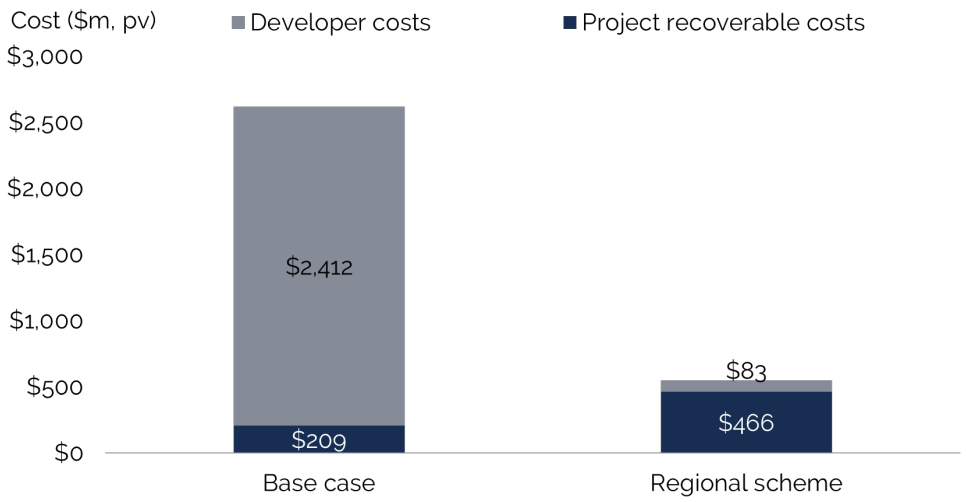
- the net present value of recoverable project costs increases to $466 million, accounting for Sydney Water's capital and operating costs of delivering the scheme

5 Calculated as the difference in these quantified benefits between Option 3 and the base case.

- the net present value of additional developer costs reduces to $83 million, as on-lot stormwater detention for stormwater management is no longer needed[6]
- the net present value of total costs decreases to around $549 million, reducing costs by $2 billion.[7]

Overall, developers benefit most from the regional scheme, regaining 310 hectares of land for development that would otherwise be sterilised permanently[xc] and reducing capital costs of stormwater management infrastructure. Based on Sydney Water's Final Business Case, we estimate that for every $1 in increased project costs associated with implementing Sydney Water's regional stormwater scheme, developers would save around $9, largely by avoiding the opportunity cost of permanently sterilised land. The broader community would also benefit from Sydney Water's regional stormwater scheme, but only by around $0.17 for every additional $1 in project costs. This is largely through indirect benefits like avoided potable water augmentation and urban cooling.

Figure 5.4 Cost comparison in Sydney Water's Final Business Case



Source: IPART analysis using data from Sydney Water, *Mamre Road Precinct – Integrated Water Cycle Management: Final Business Case*, May 2024.
Note: Values are discounted using a real social discount rate of 5%.

Finding

21. Developers are the appropriate party to fund the cost of interim solutions because they benefit the most from their implementation.

6 Developers would still need to provide on-lot stormwater detention to comply with local council flood management controls set out in the Development Control Plan.

7 Based on averaging Sydney Water's value of potential land use benefits upper and lower bounds.

Recommendation

5. Developers should fund the efficient costs of delivering stormwater services in the Mamre Road Precinct, including land tax and interim works on their own land that allow them to begin development ahead of Sydney Water's stormwater scheme.

5.5 Cost recovery mechanisms

In submissions to our Draft Report, the Mamre Road Landowners Group proposed that developers should only be liable for stormwater costs up to $500,000 per hectare, with tenants or asset owners paying the difference up to $800,000 - $850,000 per hectare through annual water charges (based on a 100-year scheme life cycle operational costing), while the Government should pay anything above this threshold.[xci]

The Property Council of Australia and UDIA recommended a developer charge of $400,000 to $500,000 per hectare, consistent with the capital costs required to build the scheme. They stated that tenants or asset owners should fund the operating costs of around $260 million identified in our Draft Report through water rates based on 100-year scheme life cycle operational costing.[xcii] Submissions from A. Chapman (individual) and Icon Oceania also questioned including operational costs in the developer servicing charge and recommended that IPART should consider an ongoing maintenance charge, rather than an upfront developer charge.[xciii]

5.5.1 Stormwater costs should be recovered via an upfront developer charge

The proposal from some stakeholders to shift operating costs to tenants or asset owners may benefit developers by reducing the upfront cash outlay. This would be an alternative to paying upfront costs and recovering them via higher rents. If forecast accurately, tenants or future landowners would be indifferent between funding these costs through recurrent stormwater charges or higher rents.

In 2018, IPART released its Final Report on its review of developer charges levied by the major metropolitan water businesses in NSW.[xciv] That report sets out the methodology Sydney Water, Hunter Water and Central Coast Council should use in calculating developer charges for water, wastewater and stormwater services. The determination allows Sydney Water to recover the costs of stormwater infrastructure in new developments upfront, to ensure that existing customers don't face higher costs that only occur because of new developments. These charges aim to recover the incremental costs to a utility of servicing a new development, beyond the expected revenue it would receive from customers in that development area over time. They also signal the different costs of providing services to different locations.

Sydney Water has used the method set out in IPART's determination to calculate its proposed developer charge per hectare for the Mamre Road precinct. These charges include:

- capital costs of providing current and future infrastructure, and
- capitalised (future operating costs less future revenue from bills)

Capitalising net operating costs is an important step signalling the *total* costs of providing services to a development area. Where postage stamp pricing is in place, this helps ensure that for locations with high ongoing costs:

- the customers receiving that service pay for those costs, and
- they receive an appropriate signal regarding the locational specific costs.

In its pricing submission to IPART on 30 September 2024, Sydney Water proposed to include the residual costs of the Mamre Road scheme in the wastewater bills of all 2.5 million customers in Sydney (i.e. postage-stamp pricing). Under this proposal, including operating costs in the developer charge is important in promoting equity, as developers compensate wastewater customers by paying up-front developer charges that cover most of those future operating costs.

If operating costs were paid by Mamre Road precinct customers instead, none of those operating costs would be being borne by Sydney Water's wastewater customer base – and therefore it would be excluded from the developer charge calculation. We estimate this may reduce the developer servicing charge from around $850,000 per hectare to around $670,000 per hectare – but it would come with a $10,000 per hectare annual stormwater bill for all properties in the precinct.[8] This should include existing residents who have not sold their properties to developers.

If operating costs were excluded from the developer servicing charge, it would require Sydney Water to propose a stormwater charge, which it has not done in its current pricing proposal for the 5 years from 1 July 2025. We are currently in the process of reviewing that proposal over the next 7 months.

We note that this cost recovery proposal could have implications for other new developments, particularly in the context of the growth of recycled water and the need to preserve water quality around greenfield sites. We consider that it would not be prudent to make a recommendation on this in isolation and without properly analysing or consulting on it. As such, we have maintained our finding that stormwater costs for the Mamre Road precinct should be recovered via an upfront developer charge of around $850,000 per hectare.

5.5.2 Negotiated Service Agreements for delayed payments and bonding options may provide flexibility for recovering stormwater costs

IPART's developer charges determination includes the ability for water businesses, including Sydney Water, to enter into unregulated Negotiated Service Agreements (NSAs) with developers. This 'opt-out' mechanism can benefit both developers and Sydney Water in providing flexibility in paying for and delivering infrastructure and services. Such an agreement would be negotiated between Sydney Water and a developer or developers.

In its submission to our Draft Report on the Mamre Road Stormwater Scheme, Sydney Water suggested that one approach to NSAs it was investigating was to collect infrastructure charges from developers in 2 steps, namely:

1. A standard capital charge per hectare for a portion of the known costs.

[8] Sydney Water's non-residential customers typically pay $1,423.55 per quarter for stormwater services for properties exceeding 4.5ha. See Sydney Water, *Prices for your business*, accessed 4 November 2024.

2. A bond to cover the potential balance of remaining outturn or estimated costs.

Under this scenario, Sydney Water would refund the portion of the bond, if any, that was more than the outturn efficient costs. It has called this a 'Plus or Minus Bonding Opportunity' (POMBO).

We consider that an NSA, such as a POMBO, is a matter for Sydney Water and developers. However, Sydney Water should ensure that the costs covered by an NSA are ringfenced from the broader customer base, so that precinct development costs are not transferred to landowners or customers in other geographic regions. Sydney Water should be able to demonstrate that the infrastructure delivered, and/or the future activities covered are not included in the cost base it seeks to recover through its recurrent customer bills.

Recommendations

6. IPART should consider whether stormwater operating costs for high-cost, new developments should be recovered from customers served by the scheme, as part of a separate review.

7. Any Negotiated Service Agreement between Sydney Water and developers in the Mamre Road precinct should ensure the capital and operating costs are ringfenced so that precinct development costs are not transferred to landowners or customers in other geographic areas.

6 Impact of stormwater charges

This chapter examines the impact of our recommended stormwater infrastructure charges on developers, taxpayers and others. We examine the impact on the economic feasibility of development in the precinct and supply of industrial land in Sydney.

6.1 Our findings and recommendations on stormwater charge impacts

Policy changes that occur after business decisions are made may create unexpected costs, but do not inherently justify compensation. Stormwater charges are one of many development costs and if there was a case for providing compensation, it is not clear that these charges are an appropriate vehicle for providing it.

When purchasing land, developers assume calculated monetary risks based on market factors at the time and they become sunk costs. As such, a prudent developer would understand the risks of unforeseen costs and factor these into their purchasing decision. If developers overvalued land at purchase, they would be faced with the decision to either recover costs through higher rents, accept lower returns or repurpose the land.

We assessed stakeholders' claims that stormwater charges above $300,000 to $500,000 per hectare could hinder development by delaying investment, leading to high vacancy rates.[xcv] Based on sales rates paid for land at the time of purchase, holding costs estimated by Atlas Economics and interim works costs estimated by the Mamre Road Landowners Group, we found that a proposed charge of $850,000 per hectare remains within acceptable margins. Although land holding and interim costs related to on-site stormwater detention, including the opportunity cost of land sterilisation, add costs and reduce expected returns, these would not affect large scale development in the precinct.

While some stakeholders claimed that interim stormwater detention could sterilise up to 60% of land[xcvi], in practice, the unexpected impact is likely to be much lower (see section 6.2.3). In addition, Sydney Water is working with developers to reduce land sterilisation and abortive costs, by aligning construction schedules and negotiating developer-delivered basins.

Developers should only pay for the efficient costs of providing stormwater infrastructure. We would expect Sydney Water to submit a Development Servicing Plan to IPART for registration based solely on efficient costs, which could potentially leave Sydney Water with a funding gap of $170,000 per hectare[9] that Sydney Water would need to address separately.

While we have not recommended taxpayer or customer contributions to stormwater costs, we note that Sydney Water customers may incur future operating expenses, including land tax, once developer contribution funds no longer cover recurrent costs.

[9] The notional funding gap of $170,000 per hectare is the difference between Sydney Water's proposed charge of $1.02 million per hectare, and our finding that the charge to recover the efficient costs is around $850,000 per hectare.

6.2 Impact of stormwater charges on development in the precinct

In its submission to our Issues Paper, the Mamre Road Landowners Group stated that industrial users within the precinct would not have the capacity to pay stormwater infrastructure contributions exceeding $300,000 per hectare without affecting development viability, or up to $500,000 per hectare if there is no interim land sterilisation for on-site stormwater detention.[xcvii] This is because land sterilisation increases holding costs and reduces available land for development. The Mamre Road Landowners Group's claims were underpinned by a report from Atlas Economics looking at development feasibility under different stormwater, and other statutory charge levels and value to Greater Sydney. Atlas Economics found that the return on cost made development unfeasible in all scenarios with stormwater contributions charges.[xcviii]

6.2.1 Land purchase prices reflect statutory charges and other expected development costs

In our Draft Report, we stated that what a developer is willing to pay to purchase a parcel of land is directly influenced by the costs associated with developing the land. If development costs are high – such as construction, infrastructure contributions, utilities and financing – developers would typically offer less for the land itself. This is because they need to ensure that the total costs of acquiring and developing the land do not exceed the reasonable return on investment for it to be profitable. We concluded that the proposed stormwater charge of $850,000 per hectare would not materially affect development in the precinct and noted that Atlas Economics' assumption of a constant land purchase price of $5.75m per hectare was not realistic.

In response to our Draft Report, the Mamre Road Landowners Group stated that:

> [IPART] cannot make statements about flexibility of land values, when 80% of the Mamre Road Precinct has been acquired prior to Sydney Water communication on proposed DSP charge for stormwater.[xcix]

The Property Council of Australia and Urban Development Institute of Australia stated:

> … this approach overlooks the fact that the developable lots across most of the precinct have already been purchased by property developers on the basis of different cost assumptions.[c]

Atlas Economics stated:

> … if a developer is aware of developer charges pre-purchase and if they are prudent, they would pay an appropriate price for land, i.e. discounting their land purchase offer compared to what they might otherwise be prepared to pay in the absence of those developer charges.[ci]

However, Atlas Economics stated that when the land was rezoned in 2020:

> … market and Industry had no reason to believe that the Precinct would be subject to new water targets or that infrastructure contributions that would be different to the above industrial areas…[which] ranged from $300,000 to $860,000 per hectare of developable area.[cii]

Subsequently, Atlas Economics considered that the price some developers paid for land would have been too high, and developers now had the choice of either absorbing the costs and accepting lower returns or increasing rents to pass on these unexpected costs to customers.[ciii] Atlas claims that both options are economically unviable because:

- the combination of higher stormwater charges, holding costs and interim land sterilisation makes it unfeasible for developers to absorb these increased costs
- businesses are already at rental capacity because a shortage of industrial land in Sydney has driven industrial land values and rents are already 65-80% above those in Brisbane and Melbourne, putting land developers at risk of losing customers interstate.

When Government policy changes occur after a business decision has been made, it may seem unfair to the business to incur costs that they didn't anticipate. However, government policy may always change with an election or in response to public needs, such as environmental protection. Businesses are expected to manage this risk of regulatory change and compliance within the context of any jurisdiction in which they choose to operate. A prudent developer would factor in some contingency for unforeseen costs, including policy change risks.

The Mamre Road Precinct Development Control Plan was first exhibited in November 2020, accompanied by Sydney Water's Flood, Riparian Corridor and Integrated Water Cycle Management Strategy, dated October 2020. The latter document outlined the Government's ongoing program of work to protect and restore Wianamatta South Creek, and emphasised the need for new stormwater infrastructure to meet water quality and flow objectives for Wianamatta South Creek and its tributaries.

While we acknowledge that this infrastructure wasn't accurately costed at that time, developers would have been aware of the substantial work being undertaken, which introduced a degree of uncertainty and risk. This would have been factored into the price they paid for land at the time of purchase.

While actual land purchase prices are not relevant to a forward-looking assessment of development feasibility because they are a sunk cost, we reviewed the prices developers paid for land in the Mamre Road precinct between 2015 and 2024, Atlas Economics' assumptions, and considered the implications for future development decisions (see Appendix A).

This analysis supports our finding that a stormwater charge of $850,000 per hectare does not lead to a large-scale question of development feasibility in the precinct.

6.2.2 Land holding costs and land sterilisation for on-site detention are material

At our Public Hearing and in a subsequent meeting with IPART staff, Atlas Economics stated that in addition to stormwater charges, developers also face costs for:

- holding land between the purchase date and the date of development, and
- undertaking interim stormwater works prior to the regional stormwater solution, including the opportunity cost of land sterilisation.[civ]

Atlas told us that holding costs are typically between 5% and 6% of the land value per annum. These include financial costs, land tax and local government rates.

In Mamre Road Landowners Group's submission to our Issues Paper, they indicated that the costs of interim works, including sterilisation, would be around $200,000 per hectare. This is based on their statement that $500,000 per hectare would be the upper limit of what developers could afford to pay for stormwater charges, if they faced no abortive costs for interim compliance or sterilisation of developable land in advance of delivery of a regional stormwater scheme.[cv]

Our analysis in Appendix A shows that holding costs and land sterilisation increase developers' costs over time, which could lead to higher rents or reduced returns. However, land sterilisation opportunity costs are unlikely to be as material as some stakeholders have claimed (see 6.2.3).

6.2.3 Developers' claims of up to 60% land sterilisation appear excessive

Atlas Economics' submission to our Draft Report stated that the impact of land sterilisation includes:

- inability to develop 50-60% of land for an unknown period
- capital costs of construction and operating costs to main infrastructure for an unknown period
- dismantling costs
- revenue deferred from delayed development on the rest of the land.[cvi]

Our follow up discussions with Sydney Water and the Department of Planning, Housing and Infrastructure indicate that some stakeholders' claims that they must sterilise up to 55% or 60% of their land are overestimated.[cvii]

The Mamre Road Precinct Development Control Plan requires 15% of site area to be made up of pervious surfaces, such as landscaping or permeable pavement.[cviii] This is a standard local council condition for flood management used in similar developments and would have been known at the time developers purchased land. While Sydney Water advised us that while around 40% of land may be required for interim stormwater detention, there are opportunities for developers to mitigate sterilisation impacts.[cix] For example, by using lower value, non-industrial land on their sites or the 15% of land area land set aside for flood mitigation for the dual purpose of meeting stormwater targets. Sydney Water also advised us that if developers can devise a solution that meets the targets using less than 40% of their land, they could potentially decrease the amount of land that needs to be sterilised.[cx]

The extent of land sterilisation can vary based on specific site characteristics. For instance, some sites include a mix of IN1 industrial land and recreational or floodplain land, allowing developers to optimise the use of higher value IN1 land while using lower-value land for stormwater basins.

Sydney Water has advised that it is working with developers to mitigate the impact of interim sterilisation by:

- allowing developer-led works for basins required for the regional scheme on their land, which will then be transferred to Sydney Water
- coordinating the regional scheme roll out with the timing of planned developments to minimise the duration of land sterilisation.[cxi]

These measures would allow developers to avoid building unnecessary infrastructure and subsequent dismantling, and to minimise the duration of interim land sterilisation for stormwater retention and treatment.

6.2.4 Stormwater contributions are one of many costs of development that developers face

Stormwater contributions are a statutory cost of development and are just one of many costs that developers face. For example, developers must also fund potable water and wastewater, special infrastructure contributions, developer contributions, as well as construction, legal, financing and other costs. Based on Atlas Economics' cost estimates, we estimate that a stormwater contribution of $850,000 per hectare represents around 5% of total development costs.

Significant increases in any of these costs could have the potential to affect development viability. In addition, financial viability is also impacted by the change in the market price of land, the overall cost of the development and the demand for the development. It would be a matter for the Government to consider whether to provide a financial incentive or subsidy to support development going ahead to realise the benefits it generates. However, it is not clear that a reduction in the stormwater contribution would be the appropriate vehicle for this subsidy.

Findings

22. A stormwater infrastructure charge of around $850,000 per hectare would not materially affect development in the Mamre Road precinct, even considering the impact of holding costs and interim land sterilisation.

23. Holding costs have the potential to reduce developer returns and potentially affect development in the precinct if scheme implementation is delayed over longer periods of time.

24. While interim on-site stormwater detention and treatment works increase developers' holding costs, they:
    a. are necessary to meet stormwater targets
    b. would reasonably have been known at the time of land purchase
    c. are unlikely to be highly material.

6.3 Impact on demand and supply of industrial land in Sydney

Some stakeholders claimed that our Draft Report did not sufficiently address the critical demand for industrial land in Sydney and the Government's growth priorities for Western Sydney.[cxii]

While we acknowledge developers' concerns regarding scarcity of industrial land in Sydney, our recommended stormwater charge would not have a substantial impact on the supply or demand for industrial land in Sydney.

There are 2 implications of tight supply of industrial land:

- Increased land costs and rents: The limited availability of industrial land drives up land costs and consequently rents, which restricts developers' ability to pass on increased costs to their customers. They risk losing business to interstate locations that offer lower rents.
- Investor confidence: Should the development of the Mamre Road precinct prove economically unviable, it could undermine investor confidence in the broader Aerotropolis and other surrounding precincts. Sydney's supply of industrial land would remain constrained.

Stakeholders suggest that this could lead to higher costs for NSW consumers, because higher rents would be passed on to consumers or goods and services would need to be transported from interstate, increasing logistics expenses.[cxiii]

These points are only relevant to the extent that stormwater charges cannot be absorbed by developers, or that setting up a large-scale industrial space in Melbourne or Brisbane is directly substitutable for establishing it near the Western Sydney Aerotropolis. For companies that have logistical or market needs tied to Greater Sydney, the Western Sydney Aerotropolis offers closer access to these markets and Sydney's growing Western Sydney population. The Western Sydney International Airport is designed to integrate with future transport infrastructure, including major road and rail networks and intermodal hubs, which would support efficient distribution within Greater Sydney. Companies may also leverage the Aerotropolis' co-located training, research and industry hubs in the area. It is also an opportunity to set up for a longer-term future as part of Greater Sydney's economic expansion. In summary, there are many factors that would influence a company's decision to buy or rent large format industrial space in the Mamre Road precinct. The rents they would pay reflect the costs of doing business in the precinct, which would be the same for all companies in the precinct.

We have found that a stormwater charge of around $850,000 per hectare would not have a material impact on demand or supply of industrial land in Sydney.

6.4 Impact on taxpayers and customers

In Chapter 5, we found no justification for taxpayers or other parties to make a direct financial contribution to stormwater scheme costs. However, they are likely to face some ongoing costs from the scheme, particularly once developer contributions cease.

Based on our infrastructure contributions model, developer contributions are calculated over about a 30-year period as most capital costs associated with the project are expected to be financed by then. However, there are some residual operating costs that will continue after this time. For example, land tax will continue to be levied on land used for the scheme. It is likely that these costs will be borne by customers once developer contributions cease. The impact on customers will depend on various factors, such as the land value, tax thresholds and rates and customer numbers.

6.4.1 Land tax will continue to have a long-term impact on Sydney Water customers

Development servicing plans typically have a 30-year horizon. However, land tax will continue to be incurred beyond this period. By the financial year 2060, land tax could comprise around $7 million per year, which would not be recovered through the development servicing plan after it expires.[cxiv] The exact impact of the tax will depend on various factors including:

- Land value escalation: Sydney Water currently assumes a real growth rate of 4% per annum for developable land and 1.5% per annum for constrained land.
- Land tax threshold indexation: Sydney Water applies a 4% indexation to the land tax value threshold.
- Taxation amounts and rates: the tax amounts and rates applied are those currently applied by Revenue NSW.[cxv]

We note that the unimproved land value across Greater Sydney has grown by 7.9% in nominal terms on average over the past 10 years.[cxvi] The threshold applied by Revenue NSW has grown by around 9.2% per year on average, over the past 5 years.[cxvii] The assumed rate is likely appropriate, however, as it remains consistent with expectations on future land value growth.

6.5 Registering development servicing plans with IPART

In 2018, IPART released our Final Report and Determination on how Sydney Water and other metropolitan water agencies should calculate maximum infrastructure charges on new developments.[cxviii]

Our Determination includes a requirement that Sydney Water prepare a development service plan (DSP) which sets out the details of how the infrastructure charge (or DSP charge) is calculated. Some of those details include the location, services, assets, costs and customer base of the DSP area.

In line with the Determination, the capital and operating costs used when calculating the DSP charge should include only the efficient costs of delivering the services. This ensures that developers do not pay more than what is efficient.

Before water businesses can levy DSP charges, they must register the relevant DSP with IPART. The DSP comes into effect upon registration with IPART. Before seeking to register the Mamre Road DSP, Sydney Water should ensure that the DSP charges are calculated using the efficient costs of providing the services.

Recommendation

8. When submitting the Mamre Road Precinct development servicing plan to IPART for registration, Sydney Water should ensure the plan is based on efficient costs only. We estimate this to be around $850,000 per hectare, including capital and operating costs.

Appendices

A Land purchase prices, holding costs and stormwater charges

Submissions from the Mamre Road Landowners' Group have stated that development of industrial land in the Mamre Road precinct would be unfeasible if the stormwater charge was higher than $300,000 per hectare. That conclusion was underpinned by feasibility analysis done on behalf of the Mamre Road Landowners' Group by Atlas Economics.

Atlas Economics' analysis considered development viability in 4 scenarios:

1. Development with s7.11 contributions only[j] ($669,000 per hectare)
2. Development with s7.11 contributions ($669,000 per hectare) and Special Infrastructure Contribution (SIC)[k] ($210,763 per hectare)
3. Development with s7.11 contributions, SIC and proposed water charges (water and wastewater $50,000 per hectare and stormwater $1.3m per hectare)
4. Development with s7.11 contributions, SIC and proposed water charges (water and wastewater $50,000 per hectare and stormwater $1.15m per hectare)

Atlas Economics found that the return on cost was less than the 16-18% margin threshold said to be required by developers for development to be viable in all scenarios with stormwater contributions. The analysis by Atlas assumed a constant land purchase price of $5.75 million per hectare in all scenarios, which it stated was informed by market sales transactions in the precinct in the period from 2020 to 2022.

Land purchase prices in the precinct between 2015 and 2024

While land purchase prices are not relevant to a forward-looking assessment of development feasibility, we have examined the prices paid for land in the Mamre Road industrial precinct between 2015 and 2024. We obtained this sale price data from the Valuer General's public database.

Of 72 industrial land parcels in the precinct, around two thirds had been sold prior to March 2023, when Sydney Water's stormwater charges first became known. Since 2015, the data showed sales of 62 parcels of vacant, wholly or mostly industrial-zoned land in the Mamre Road precinct.[l] Of these, only 6 were sold for prices above $5.75m per hectare, which was assumed by Atlas Economics in its feasibility analysis, and 3 of those sales took place in early 2024 after stormwater charges were known.

[j] Development contributions levied by a local council under section 7.11 of the *Environmental Planning and Assessment Act 1979 (NSW)*.

[k] A special infrastructure contribution (SIC) is paid by developers within a defined special contributions area to help fund infrastructure delivery such as state and regional roads and open space. There are currently two active special contributions areas: the Western Sydney Growth Areas and Western Sydney Aerotropolis.

[l] Some land parcels had traded more than once.

Impact of holding costs, land sterilisation and interim works

At the Public Hearing and in their submission to our Draft Report, Atlas Economics noted that developers also face costs for:

- holding land between the purchase date and the date of development, and
- undertaking interim stormwater works prior to the regional stormwater solution.

Atlas Economics stated that holding costs are typically between 5% and 6% of the land value per annum. These include financial costs, land tax and local government rates. We used a rate of 5.5% per annum for holding costs.

The costs associated with interim works are somewhat harder to estimate, but we have used information provided by stakeholders to establish an approximate figure. In the Mamre Road Landowners' Group's submission to our Issues Paper, they indicated that developers' capacity to pay would increase by $200,000 per hectare to $500,000 per hectare if developers faced no abortive costs for interim compliance or sterilisation of developable land in advance of delivery of a regional stormwater scheme.[cxix]

Atlas indicated that development would be feasible, in their view, if the land purchase price was $5.75m per hectare, and the only government charges applicable were s7.11 contributions and the Special Infrastructure Contribution. Therefore, any property whose actual sale price[m] was less than $4.9m per hectare[n] would meet or exceed the 16-18% margin threshold with stormwater charges of $850,000 per hectare.

Figure A.1 shows that when adjusting land purchase prices for holding costs and interim sterilisation costs, there are 12 properties that paid more than $4.9m per hectare. Further analysis shows that:

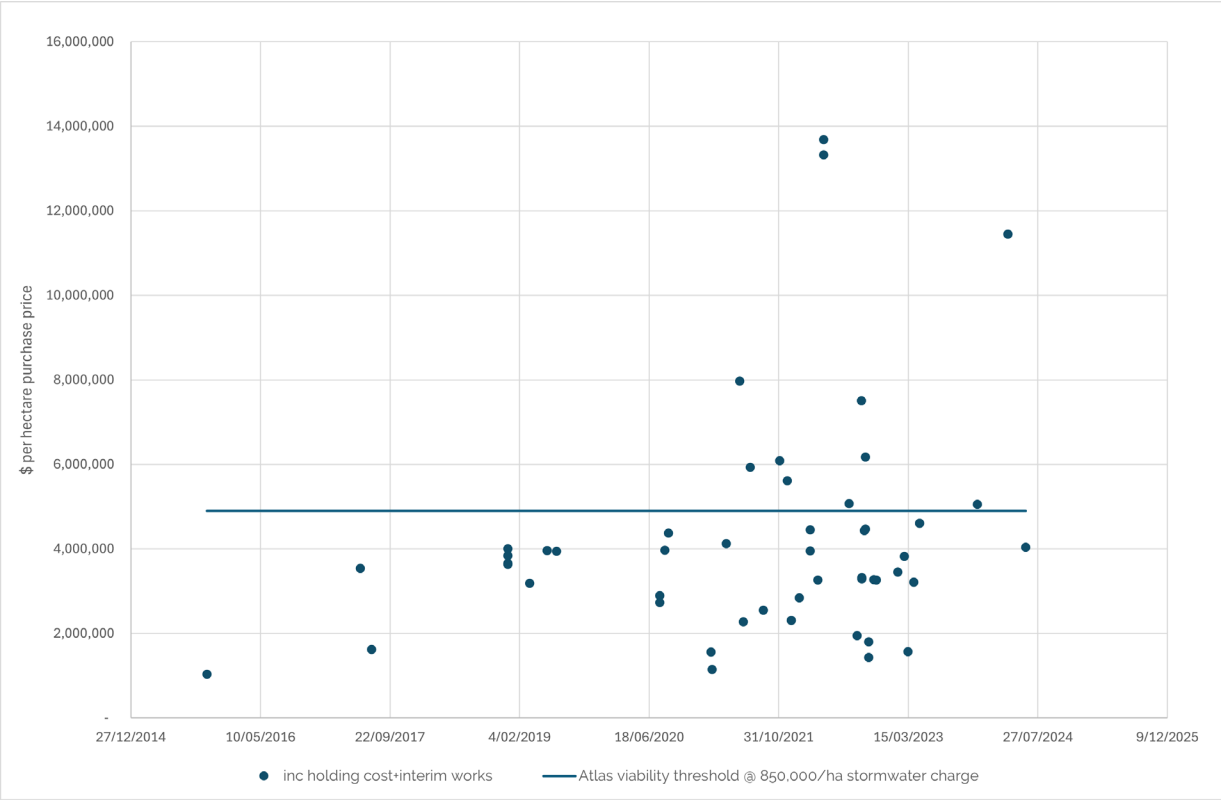
- 3 of these properties were purchased after stormwater charges were known in early 2023
- 3 other properties (not the same 3 as above) submitted Development Applications to the Penrith City Council in September 2024 for works in the order of $23.8 to $87.1 million.

This indicates that for these properties, the developers may face different costs and prospective revenue streams than what Atlas Economics assumed in its analysis, which would make development feasible for them at that purchase price.

[m] Adjusted for holding costs since the purchase date and for the cost of interim works.

[n] $4.9m per hectare is $5.75m per hectare less the stormwater charge of $850,000 per hectare.

Figure A.1 Purchase price, adjusted for holding costs and interim works

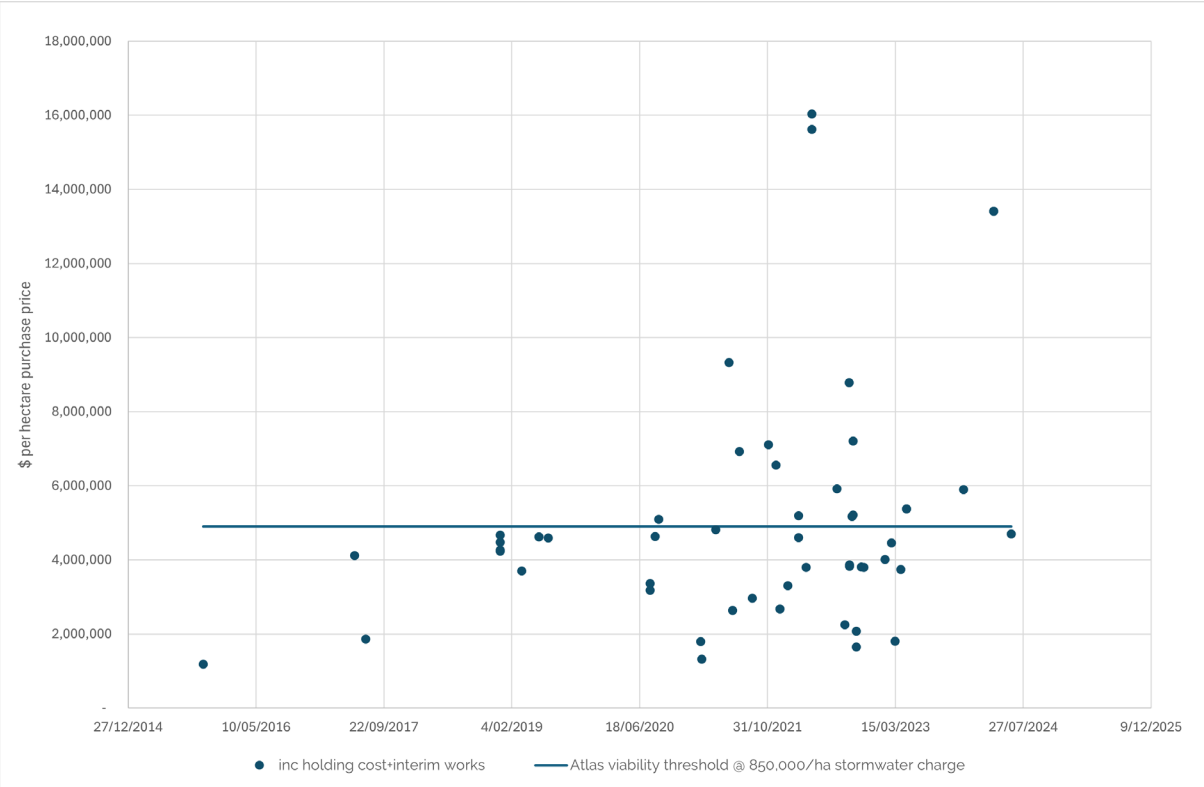


Source: IPART analysis using Atlas Economics assumptions.

If land sterilisation costs were zero, it would not materially change these findings with 10 properties still being above the 16-18% margin threshold.

However, holding costs have a more material impact, depending on the length of time land is held without development. Figure A.2 illustrates how economic viability would be affected with an additional 3 years of holding costs – more properties would be above the margin threshold.

Figure A.2 Purchase price with holding costs for an additional 3 years



Source: IPART analysis using Atlas Economics assumptions.

Table A.1 Mamre Road precinct properties - purchase price, holding costs and interim costs

	Address	Title ID	Area (Ha)	Last purchase date	Purchase price ($)	Price/Ha ($)	Holding cost at 5.5% pa ($)	Holding time (years)	Price + holding and interim costs ($/Ha)	Is the 16-18% margin threshold incl stormwater exceeded?
1	59-62 Abbotts Rd	112/1296469	10.65	22/04/2022	125,030,916	11,739,992	1,743,602	2.59	13,683,594	Yes
2	63-72 Abbotts Rd	111/1296469	10.94	22/04/2022	125,030,916	11,428,786	1,697,382	2.59	13,326,168	Yes
3	199 Aldington Rd	26/255560	2.54	26/06/2019	7,123,200	2,800,000	940,900	5.41	3,490,900	No
4	285 Aldington Rd	10/1296455	8.32	15/09/2022	54,073,500	6,500,000	807,187	2.19	7,507,187	Yes
5	1-23 Aldington Rd	40/708347	10.12	3/02/2023	29,854,000	2,950,000	298,452	1.80	3,448,452	No
6	106-124 Aldington Rd	32/258949	11.16	1/03/2022	36,162,500	3,240,367	509,749	2.73	3,950,117	No
7	113-127 Aldington Rd	36/258949	10.12	27/04/2023	41,000,000	4,051,383	355,892	1.57	4,607,276	No
8	126-142 Aldington Rd	31/258949	10.12	1/03/2022	37,200,000	3,675,889	578,262	2.73	4,454,152	No
9	129-139 Aldington Rd	35/258949	10.12	29/07/2022	43,500,000	4,298,419	567,933	2.32	5,066,352	Yes
10	141-153 Aldington Rd	34/258949	10.12	27/04/2023	41,000,000	4,051,383	355,892	1.57	4,607,276	No
11	144-160 Aldington Rd	30/258949	10.09	16/09/2022	27,747,500	2,750,000	341,049	2.18	3,291,049	No
12	155-167 Aldington Rd	33/258949	10.12	1/09/2021	20,037,600	1,980,000	373,133	3.22	2,553,133	No
13	162-178 Aldington Rd	23/255560	10.19	16/09/2022	28,322,500	2,779,441	344,700	2.18	3,324,141	No
14	169-181 Aldington Rd	28/255560	10.12	21/05/2019	28,336,000	2,800,000	960,707	5.51	3,960,707	No
15	180-196 Aldington Rd	22/255560	10.15	16/09/2022	28,000,000	2,758,621	342,118	2.18	3,300,739	No
16	183-197 Aldington Rd	27/255560	10.12	21/05/2019	28,336,000	2,800,000	960,707	5.51	3,960,707	No
17	198-212 Aldington Rd	21/255560	10.15	2/11/2022	27,912,500	2,750,000	319,812	2.05	3,269,812	No
18	201-217 Aldington Rd	25/255560	10.12	18/12/2021	18,216,000	1,800,000	305,589	2.93	2,305,589	No
19	214-228 Aldington Rd	20/255560	10.22	11/11/2022	28,105,000	2,750,000	315,762	2.03	3,265,762	No
20	219-233 Aldington Rd	24/255560	10.13	3/12/2021	46,750,000	4,615,005	795,388	2.97	5,610,393	Yes
21	230-242 Aldington Rd	18/253503	10.16	16/10/2015	5,200,000	511,811	321,614	9.11	1,033,425	No
22	235-251 Aldington Rd	10/253503	10.15	13/07/2021	48,567,750	4,785,000	943,599	3.36	5,928,599	Yes
23	244-256 Aldington Rd	17/253503	10.15	30/09/2022	54,000,000	5,320,197	647,531	2.15	6,167,728	Yes
24	253-267 Aldington Rd	9/253503	10.15	5/04/2023	28,000,000	2,758,621	252,030	1.63	3,210,651	No

	Address	Title ID	Area (Ha)	Last purchase date	Purchase price ($)	Price/Ha ($)	Holding cost at 5.5% pa ($)	Holding time (years)	Price + holding and interim costs ($/Ha)	Is the 16-18% margin threshold incl stormwater exceeded?
25	258-270 Aldington Rd	16/253503	10.19	7/12/2023	47,000,000	4,612,365	242,985	0.96	5,055,350	Yes
26	290-308 Aldington Rd	13/253503	10.46	18/01/2022	23,760,000	2,271,511	373,582	2.84	2,845,093	No
27	74-88 Aldington Rd	42/708347	10.21	26/09/2022	38,500,000	3,770,813	461,435	2.16	4,432,248	No
28	90-104 Aldington Rd	41/708347	10.12	30/09/2022	38,500,000	3,804,348	463,034	2.15	4,467,382	No
29	99-111 Aldington Rd	37/258949	10.12	18/12/2021	18,216,000	1,800,000	305,589	2.93	2,305,589	No
30	1030-1048 Mamre Rd	3/250002	11.61	4/11/2021	58,000,000	4,995,693	885,966	3.05	6,081,659	Yes
31	1050-1064 Mamre Rd	4/250002	10.16	31/03/2022	27,000,000	2,657,480	404,550	2.65	3,262,030	No
32	1080-1094 Mamre Rd	26/258415	10.13	27/02/2023	33,450,000	3,302,073	321,293	1.73	3,823,366	No
33	657-703 Mamre Rd	34/1118173	26.67	29/07/2020	57,000,000	2,137,233	555,861	4.32	2,893,094	No
34	706-752 Mamre Rd	1/104958	52.1	10/06/2024	195,000,000	3,742,802	91,131	0.45	4,033,933	No
35	707-711 MamreRd	X/421633	19.25	17/08/2020	57,750,000	3,000,000	769,732	4.27	3,969,732	No
36	707a Mamre Rd	1/1018318	29.06	11/02/2021	32,277,351	1,110,714	249,014	3.78	1,559,728	No
37	713-755 Mamre Rd	Y/421633	17	30/05/2017	38,000,000	2,235,294	1,101,871	7.48	3,537,165	No
38	754-770 Mamre Rd	60/259135	10.12	31/08/2020	33,653,224	3,325,417	844,655	4.23	4,370,072	No
39	757-769 Mamre Rd	22/258414	26.63	29/07/2020	53,538,500	2,010,458	522,889	4.32	2,733,347	No
40	771-781 Mamre Rd	23/258414	19.28	13/10/2022	21,227,767	1,101,025	131,655	2.11	1,432,680	No
41	772-782 Mamre Rd	61/259135	3.875	2/06/2021	25,000,000	6,451,613	1,318,847	3.47	7,970,460	Yes
42	783-797 Mamre Rd	24/258414	19.39	13/10/2022	27,695,569	1,428,343	170,794	2.11	1,799,137	No
43	784-786 Mamre Rd	59/259135	23.06	12/04/2021	74,632,140	3,236,433	690,866	3.61	4,127,299	No
44	788-804 Mamre Rd	58/259135	10.31	15/03/2019	22,682,000	2,200,000	784,025	5.69	3,184,025	No
45	799-803 Mamre Rd	2001/1036837	6.76	16/02/2021	5,250,000	776,627	173,417	3.76	1,150,044	No
46	805-817 Mamre Rd	26/258414	20.83	14/03/2023	26,000,000	1,248,200	118,440	1.69	1,566,640	No
47	806-824 Mamre Rd	57/259135	10.83	21/12/2018	27,295,000	2,520,314	940,559	5.92	3,660,873	No
48	826-842 Mamre Rd	56/259135	12.66	21/12/2018	35,098,011	2,772,355	1,034,618	5.92	4,006,973	No
49	844-862 Mamre Rd	55/259135	12.09	21/12/2018	32,038,500	2,650,000	988,957	5.92	3,838,957	No
50	859-869 Mamre Rd	30/258414	30.98	29/08/2022	48,000,000	1,549,387	196,756	2.23	1,946,143	No

	Address		Title ID	Area (Ha)	Last purchase date	Purchase price ($)	Price/Ha ($)	Holding cost at 5.5% pa ($)	Holding time (years)	Price + holding and interim costs ($/Ha)	Is the 16-18% margin threshold incl stormwater exceeded?
51	864-882	Mamre Rd	54/259135	10.9	21/12/2018	27,250,000	2,500,000	932,978	5.92	3,632,978	No
52	884-902	Mamre Rd	53/259135	10.12	2/04/2024	110,000,000	10,869,565	377,922	0.64	11,447,488	Yes
53	885-899	Mamre Rd	32/258414	14.48	16/06/2021	25,000,000	1,726,519	348,671	3.44	2,275,191	No
54	904-928	Mamre Rd	52/259135	10.12	2/04/2024	110,000,000	10,869,565	377,922	0.64	11,447,488	Yes
55	919-929	Mamre Rd	35/258414	5.39	13/07/2017	5,150,000	955,473	461,816	7.36	1,617,289	No

Note: This list is based on the latest sale date and price traded. Some properties traded more than one in the period, in which case we excluded the earlier sale from our consideration of holding costs.
Source: Valuer-General database; Atlas Economics and IPART analysis.

ISBN 978-1-76049-777-4

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