



CITY OF
TEA TREE GULLY
Naturally Better

2025-2034

Water

Asset Management Plan

Asset management plans (AMPs) are used to guide the planning, construction, maintenance and operation of our infrastructure.

These plans are key components in our long-term financial planning. They include detailed information about each asset and define what services will be provided, how they will be provided and what funding is required to cost-effectively deliver them over a 10-year period.

For more information call 8397 7444
or visit cttg.sa.gov.au/amp

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Wynn Vale Dam, Wynn Vale

Introduction

The City of Tea Tree Gully's water assets provide valuable services that are part of our community's everyday life. They have been established over a long period of time and must be properly maintained and developed to ensure continued community benefit.

Our water network (stormwater and recycled water) plays an important role in flood mitigation, reducing water pollution, managing water resources and distributing water for use throughout the city.

The primary purpose of stormwater drains and structures is to direct stormwater away from roads and property. Stormwater may be treated by waste interception devices to reduce pollution before discharging into creeks and wetlands.

Creeks and wetlands play an important part in providing water supplies, maintaining and enhancing the natural environment and providing amenity for the local community. Stormwater harvested through wetlands and dams contributes to Council's aquifer recharge scheme where stormwater is treated and injected into underground aquifers.

Recycled water infrastructure provides Council the ability to recharge aquifers, irrigate parks and sporting fields and reduce demand on mains water by the use of our extensive distribution network in the City. It is a sustainable alternative source of water not only for irrigation, but also for water cartage for dust suppression, street tree watering and street sweeping.

Treatment Plants in Golden Grove and Wynn Vale are key components of the recycled water network, along with 'end of the line' infrastructure such as pumping stations and water storage tanks present at many major reserves and sporting hubs.

The use of recycled water contributes to improving:

- The resilience of the City to climate change impacts.
- Use of stormwater harvesting as a sustainable approach to stormwater management (reducing the demand on Council's stormwater infrastructure).
- Reducing reliance on mains water.
- Maintaining and improving biodiversity and environmental health.
- Maintaining green infrastructure.

This asset management plan is used to guide the planning, construction, maintenance and operation of Council's water infrastructure. It details our approach to managing our water assets, future demand and risk, and our compliance with regulatory requirements. It also identifies the estimated capital expenditure necessary to provide water infrastructure and associated services to the community over a 10-year period.

Our goal in managing our water assets is to meet the required service levels in the most cost-effective manner for present and future customers. This means timing infrastructure renewals before unplanned maintenance costs become excessive, but not so soon that assets are renewed before it is necessary.

Our water assets include stormwater pits and pipes, culverts, gross pollutant traps, wetlands, treatment plants, recycled water pipes and valves, pump stations, bores, storage tanks and control systems. The total current replacement cost of these assets is about \$262.6 million.

Approximately \$2.52 million is required each year to maintain, operate and renew our stormwater infrastructure assets in accordance with our current service levels.

Actual annual expenditure will vary from year to year as we acquire more assets, build new assets and undertake major renewal works.

The asset management plan should be read in conjunction with Council's key strategic management, planning and policy documents, including our Asset Management Policy, Long-Term Financial Plan and Annual Business Plan and Budget.

Collectively, these plans support the achievement of our vision for our City – A thriving community that enjoys a quality lifestyle that values its people and natural environment.

The Water Asset Management Plan is reviewed annually, with a full update completed within two years of each Council election.

We incorporate community feedback into our asset management plans through information provided via community and user surveys, the review of common customer requests, and community engagement projects.

Visit cttg.sa.gov.au/amp to view all of our asset management plans.



Water profile

Asset quantity

486 km

Stormwater pipes

13

Gross pollutant traps

18,800

Stormwater pits & structures

36

Wetlands

55 km

Recycled water pipe

31

Bores

24

Pump stations

42

Storage tanks



- Stormwater pipes – \$159.0 million
- Stormwater pits – \$67.2 million
- Recycled water – \$32.8 million
- Wetlands/dams – \$3.6 million

Service levels

The current water asset service levels are driven by Council's strategic plan and vision for the City, legislative requirements and community research.

Service level drivers

Community insight

Community and user surveys along with customer request data allows us to understand resident satisfaction with our asset management program and provides guidance for continuous improvement.

While suggested improvements may not directly relate to the maintenance or renewal of an asset, they can influence the use of an asset, which can impact its serviceable life.

Strategic and organisational goals

Our vision for a thriving community with a quality lifestyle that values its people and natural environment is the foundation of our strategic and organisational goals.

Council's Strategic Plan 2025¹ (Draft Strategic Plan 2030 currently being developed) articulates the vision and aspirations for our community, and details objectives for these aspirations. The objectives listed below are linked directly to the Water Asset Management Plan.

Community

- People feel a sense of belonging, inclusion and connection with places, spaces and the community.
- People can have a say in decisions that affect them and the key decisions of the Council.

Environment

- Environmentally valuable places and sites that are flourishing and well cared for.
- A community that is protected from public and environmental health risks.
- Our consumption of natural resources is minimised by reducing, reusing and recycling products and materials, and using renewable resources.
- The carbon footprint of our city is reduced through the collective efforts of community and Council, including businesses.
- We are resilient to climate change and equipped to manage the impact of extreme weather events.

Places

- Infrastructure and community facilities are fit for purpose, constructed using sustainable practices and well maintained.

Leadership

- Planning considers current and future community needs.
- Delivery of services is sustainable and adaptable.
- Decision making is informed, based on evidence, and consistent.
- Major strategic decisions are made after considering the views of our community.

¹ Strategic Plan 2025 - cttg.sa.gov.au/strategicplan

Legislative requirements

There are many legislative requirements relating to the management of water assets. These include:

- *Local Government Act 1999*
- *Environment Protection Act 1993*
- *Environmental Protection (Water Quality) Policy 2015*
- *WSA 05-2013 – Conduit Inspection Reporting Code of Australia*
- *Australian Standards*
- *Work Health & Safety Act 2012 (South Australia)*
- *South Australian Public Health Act 2011*
- *Australian and New Zealand Environmental and Conservation Council (ANZECC) Water Quality Guidelines*
- *Guidelines for managing risk in recreational water NHMRC 2008*
- *Landscape South Australia Act 2019*
- *South Australian Public Health (Wastewater) Regulations 2013*
- *Water Industry Act 2012*
- *Water Industry Regulations 2012*
- *Essential Services Commission Act 2002*
- *Dangerous Substances Act 1979 and associated regulation 2017*
- *Livestock Act 1997 (section 3.6)*
- *Australian Guidelines for Water Recycling: Managed Aquifer Recharge*
- *Australian Guidelines for Water Recycling: Stormwater Harvesting and Reuse*
- *Landscape South Australia Act 2019.*

In regards to legislative requirements, the following reports are completed for Recycled Water (RW) and Managed Aquifer Recharge (MAR) operations:

- EPA Annual Returns (RW and MAR)
- EPA and DEW MAR-ART Annual Report (MAR)
- ABS Water Supply and Sewerage Services survey (RW and MAR)
- BOM & OTR Annual National Performance Report (RW and MAR)
- DHW Wastewater Tertiary Treatment and Recycled Water System Annual Report (RW)
- ESCOSA Annual Price Monitoring Report (RW and MAR)
- OTR Annual SRMTMP Internal Audit Checklist (RW and MAR)
- SA Water Quarterly Trade Waste (RW)
- DEW MAR and Bores Annual Returns (MAR).

On-site audits performed are:

- OTR SRMTMP Audit (every 5 years for RW and MAR)
- EPA Audit (every 5 years for RW and MAR)
- SA Water Trade Waste Audit (every 3 years for RW).

Definitions:

EPA - Environment Protection Authority

DEW - Department for Environment and Water

ABS - Australian Bureau of Statistics

BOM - Bureau of Meteorology

OTR - Office of the Technical Regulator

DHW - Department for Health and Wellbeing

ESCOSA - Essential Services Commission of SA

SRMTMP - Safety, Reliability, Maintenance and Technical Management Plans.

Service level performance

The performance of our assets is measured in two ways:

Customer service levels

How the customer receives or experiences the service. The measures used in this asset management plan are quality, function and safety.

Technical service levels

What we do to deliver the service.

The current water asset service levels are driven by Council's Strategic Plan 2025 and vision for the City, legislative requirements, community research and resources available within the current Long-Term Financial Plan (2025-2034).

These service levels will be used to:

- Clarify the level of service customers expect
- Identify the work required to meet these service levels
- Identify the costs and benefits of the services offered
- Enable Council and customers to analyse the quality, function and safety of water assets based on the existing service levels
- Determine the impact (primarily financial) of increasing or decreasing the service levels.

Technical service levels

Supporting the customer service levels are operational or technical measures of performance. These technical measures relate to the allocation of resources to best achieve the desired customer outcomes and demonstrate effective performance.

Technical service measures are linked to the activities and annual budgets covering:

- **Operations** – the regular activities to provide services (e.g. street sweeping, pits and pipes cleaning etc.)
- **Maintenance** – the activities necessary to retain an asset as near as practicable to an appropriate service condition. Maintenance activities enable an asset to provide service for its planned life (e.g. side entry pit lid replacement, lid frame repair)
- **Renewal** – the activities that return the service capability of an asset up to that which it had originally (e.g. replacement of unserviceable pits and pipes)
- **Upgrade/New** – the activities to provide a higher level of service (e.g. larger volume pits or pipes) or a new service that did not exist previously (e.g. a new stormwater system to mitigate flooding issues).

Service and asset managers plan, implement and control technical service levels to influence the customer service levels.

Customer service levels

Stormwater service levels

Performance measure	Service level	Performance measure process	Current performance	Performance target
Quality <i>How good is the service, including its condition and quality</i>	Minimise localised flooding and overflow through private properties	Customer request regarding flooding	Measured through Customer Request Management system 44 – 2020 FY 31 – 2021 57 – 2022 117 – 2023 (large rain event in November 2022, and May 2023) 53 – 2024.	Reduction in customer requests over time e.g. less than 30 per annum
	Minimise localised flooding and overflow through private properties	Survey the community to obtain feedback on their perception of how well council assets are performing	2024 survey (117 responses) 61% satisfaction (12% dissatisfaction) in question to when large rainfall events occur, are private properties and people are protected from flooding?	Continue to monitor locations with known flooding issues, and also proactively inspect areas possible to flooding and rectify as required
	Reduce pollution of water ways and creeks	Material intercepted by waste interceptors, street sweeping and from side entry pit cleaning activities	Material is removed from the water table via street sweeping, side entry pits and waste interceptors are cleaned of debris by internal staff and contractors	Measure the amount of material to quantify if waste interceptor processes are working effectively
Function <i>How suitable is the service for its intended purpose</i>	Ensure stormwater system meets community expectations by effectively draining away stormwater	Customer request regarding flooding	Measured through Customer Request Management system 44 – 2020 FY 31 – 2021 57 – 2022 117 – 2023 (large rain event in November 2022, and May 2023) 53 – 2024	Reduction in customer requests over time e.g. less than 30 per annum

Customer service levels

Stormwater service levels

Performance measure	Service level	Performance measure process	Current performance	Performance target
Safety <i>How safe is the asset for users of the service</i>	Minimise property damage from flood waters.	Insurance claims received per annum.	9 claims in 2022 5 claims in 2023.	Reduction of claims in the future. Collate information on flooding issues to monitor and rectify (if required)
	Ensure roads and footpaths are safe to use during rain events	Survey the community to obtain feedback on their perception of how well council assets are performing	2024 survey (121 responses) 69% satisfaction (14% dissatisfaction) in question to roads remaining safe to use when it rains 67% satisfaction (18% dissatisfaction) in question to footpaths remaining safe to use when it rains	Common comments raised from the survey relate to water pooling of the road. Action requests relating to pooling water on roads, and rectify (asphalt or kerb reinstatement) During verge maintenance, ensure paths are clean from debris and don't accumulate to cause slippery surfaces during and after rain events

Technical service levels

Stormwater service levels

Performance measure	Service level	Performance measure process	Current performance	Performance target
Operations				
Stormwater pipes	Condition assessments in accordance with WSA05 2008 standards to inform maintenance requirements and renewal program candidates.	Number of customer service requests regarding maintenance per annum.	Pipe network is condition assessed each year based on reactive requirements. Current annual expenditure: \$50,000.	Proactive and reactive inspection to target minimum 2.5% of network per year which is equivalent to approximately 12 km per year (486km of stormwater pipes). Estimated cost: \$100,000 per year.
Blockages	Proactive/reactive high-pressure cleaning of pipelines using hydrojet equipment. Proactive/reactive sump and pit cleaning program. Street sweeping of water table to reduce the amount of debris entering stormwater network.	Reduction in flooding and pipe failures created by blocked pipelines. Reduction in flooding and pit failures created by blocked pits. Completion of annual street sweeping program.	Programmed proactive stormwater infrastructure cleaning program. Current annual budgeted expenditure: \$120,000.	Programmed proactive cleaning in addition to reactive cleaning. Estimated cost: \$120,000 per year.
Gross pollutant traps and trash racks	Proactive cleaning of gross pollutant traps, to remove debris that has been intercepted before entering creels/watercourses. Trash racks debris collection checked and cleared frequently prior to large rain events.	The amount of debris collected in these devices does not reach the capacity, and either operate ineffectively or get damaged due to overloading.	Gross pollutant traps cleaned twice-yearly Trash racks cleaned (if necessary) prior to large rain events.	As per current performance in regards to cleaning. Develop a trash rack audit program on a cyclical basis rather than dependent on weather events.

Technical service levels

Stormwater service levels

Performance measure	Service level	Performance measure process	Current performance	Performance target
Maintenance				
Pipes, channels and structures (side entry pits, gross pollutant traps)	Urgent repairs (minor in nature) to ensure continued suitable functionality of assets.	Customer requests (maintenance) of unserviceable assets. Number of infrastructure failures per annum.	Reactive maintenance within budget allocation. Side entry pits (frame and lid replacements) repairs completed by internal staff.	To address high risk reactive maintenance requirements within 12 months.
Renewal				
Pipes, channels and structures (side entry pits, gross pollutant traps)	To provide serviceable assets in the most efficient and cost-effective manner.	Ongoing renewal/upgrade or rehabilitation program, with prioritising projects based on risk.	Primarily reactive renewal identified from inspections and/or customer requests.	Rehabilitation and capital renewal/upgrade program that addresses defects within 12 months to maintain assets at acceptable service levels.
Upgrade/New				
Pipes, channels and structures (side entry pits, gross pollutant traps)	To provide service in accordance with the following design standards: 1 in 5 AEP (annual Exceedance Probability) for residential (standard pits and pipes). 1 in 10 AEP for industrial. 1 in 100 AEP for watercourses. Ensure stormwater system has appropriate design capacity.	Number of properties experiencing flooding (customer requests). Number of properties experiencing inundation events.	Reactive upgrades based on customer request (flooding). <10 per year No property affected more than twice in 5 years.	Acquire detailed designs and undertake proactive upgrades based on capacity requirements and flood mitigation. <10 per year No property affected more than twice in 5 years.

Technical service levels

Recycled water service levels

Performance measure	Service level	Performance measure process	Current performance	Performance target
Operations				
Legislation	Undertake tasks and reporting requirements relating to the operation of the Wastewater Treatment Plant and associated infrastructure.	Comply with all legislative requirements and acts in regards to operating a Wastewater Treatment Plant. This includes activities such as water sampling and reporting, Managed Aquifer Recharge (MAR)-ART reporting, Performance reporting, Department of Health annual reporting, Trade Waste Audits etc, as detailed in Legislative requirements (on page 5 of this plan).	Committed to: Applying a risk-based management approach that is consistent with the Australian Guidelines of Water Recycling (AGWR). Applying the principles of ESCOSA in the management of the recycled water scheme. Applying the principles of the Office of Technical Regulator in the operation, maintenance and planning of the recycle water scheme.	As per current performance. In addition: Continually improve Council practices by assessing performance against statutory requirements, technical guidelines and standards, corporate commitments and stakeholder expectations.
Inspections	Undertake routine scheduled maintenance inspections to ensure all infrastructure and equipment is in working order for effective function of services provided.	Complete scheduled inspections as intended.	Wastewater Treatment Plant – Inspections occur: daily, weekly, monthly and quarterly. MAR operation: on a 2-3 months cycle, depending on optimal scheduling of site visits for other activities.	As per current performance. Continually improve and enhance the reportability of inspections to analyse trends and future requirements.

Performance measure	Service level	Performance measure process	Current performance	Performance target
Maintenance				
Recycled water infrastructure <i>(Wastewater Treatment Plant, pump stations, pipework, valves, storage tanks etc.)</i>	Urgent repairs (minor in nature) to ensure continued suitable functionality of assets.	Repairs identified through central-controlled management system (SCADA) and regular maintenance inspections.	Reactive maintenance within budget allocation.	To address high risk reactive maintenance issues in the required timely manner, to ensure minimal operating downtime.
Renewal				
Recycled water infrastructure <i>(Wastewater Treatment Plant, pump stations, pipework, valves, storage tanks etc.)</i>	To provide serviceable assets in the most efficient and cost-effective manner.	Renewal items identified through regular maintenance inspections.	Assets renewals added for consideration in annual budgeting processes.	To renew assets at optimal lifecycle periods, to decrease the risk of complete asset failure and increased costs to remediate in a reactive manner.



Tiered gabion structure, creek rehabilitation, Cobbler Creek East Reserve, Golden Grove

Future demand

Population growth, social and climate changes can impact community demand for services. This section looks at these trends and examines the strategies required to address them.

Demand drivers

Drivers affecting demand include:

- Population changes
- Climate change
- Water resources
- Customer preferences and expectations
- Economic factors
- Seasonal factors
- Environmental awareness.

Demand forecasts

Population growth and infill development

The City of Tea Tree Gully's population is forecast to grow to 107,489 by 2036 (in 2021 – the last census year – the population was 101,174). Long-term, this rise in population may result in a higher capacity placed upon stormwater assets, which may shorten the useful life of our assets and increase maintenance costs.

Infill development (where two or three dwellings are built on an existing allotment) has occurred at a significant rate within the last 10 years. This is primarily occurring in the central east, Modbury, Modbury North and Holden Hill zones, which were originally developed in the 1960s and 1970s.

There is a direct correlation between infill development and an increase in impermeable surfaces that contribute to the demand on the stormwater network and downstream watercourses.

Council has controls in place, through the Planning and Design code Stormwater Management Overlay, to manage stormwater discharged from new developments by requiring the installation of detention tanks (connected to 60% of the roof area for a standard dwelling) to reduce the demand on the stormwater network in peak storm events and for reuse (less demand on water resources)

Climate change

Climate change modelling for South Australia undertaken by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) predicts:

- A medium confidence that there will be a decrease in winter and spring rainfall, but an increase in the frequency of high intensity rainfall - this means that there may be areas of the existing stormwater network that may require upgrades to prevent localised flooding
- A high confidence that there will be an increase in drought conditions and evapotranspiration rates (atmospheric moisture demand), impacts on biodiversity along creeks and waterways, damage to riparian zones increasing the risk of bank erosion
- A high confidence of harsher fire weather.

In response to climate change, Council has an ongoing monitoring program that assesses the performance of the stormwater network to identify areas of concern and develop strategies to manage demand on the network.

It is acknowledged that there is more work that needs to be undertaken in this area to provide long-term sustainable management of stormwater and water resources in the City.

Water resources

The implementation of recycled water schemes are important for the following reasons, which align with Council's Strategic Plan:

- Reducing pressure on climate dependent water resources.
- Mitigating climate change by using stormwater to maintain and improve green infrastructure, biodiversity and ecosystem health.
- Reducing the adverse impact of urban heat island impacts by creating more comfortable ambient temperature in and around irrigated reserves, creeks and wetlands.
- Promoting environmental sustainability by:
 - Retaining water in the City to enhance biodiversity in wetlands, creeks and waterways.
 - Reducing reliance on mains water and the River Murray.
 - Increasing the available water required for environmental flows to improve riparian health and reduce the risk of erosion and sediment transport.
 - Reducing mains water demand and associated costs.
 - Recharging underground aquifers with treated water providing environmental benefit.
 - Mitigating flood impacts.
 - Improving water quality with pre-treatment that takes place in wetlands.
 - Protecting the environment through the reduction of effluent discharge into the ocean.

Environmental awareness

The growing social awareness around environmental management has had a significant impact on stormwater management both from customer expectation and legislative requirements.

The Environment Protection Authority (EPA) is responsible for the control of stormwater pollution through the Environment Protection Act 1993 (EP Act). It provides the regulatory framework to protect the South Australian environment and is supported through a suite of subordinate legislation and regulatory tools including the Environment Protection (Water Quality) Policy 2015 (the Water Quality Policy).

The Water Quality Policy is second-level legislation and offers more specific protection for the state's waters. It prohibits the pollution of the stormwater system and our natural waters. The policy has general obligations which every person, business and industry must comply with as well as specific obligations for particular activities.¹

Economic factors

While there is a general community desire to reduce rate increases, not appropriately funding Council services has the potential to affect the way City of Tea Tree Gully delivers services to the community. If there is a funding shortfall to manage existing assets to the agreed level of service, that level of service will need to be reduced or priorities revised. A shortfall could also result in the inability to provide new assets or upgrades desired by the community.

¹ www.epa.sa.gov.au/stormwater

Upper Dry Creek stormwater management plan

The purpose of the Upper Dry Creek Catchment Stormwater Management Plan (SMP) is to develop and integrated set of works and measures that will mitigate flooding in the catchment, protect water quality and facilitate increased stormwater reuse. The preparation of the SMP will include hydraulic and hydrological modelling, water quality modelling, stormwater infrastructure inspections and catchment risk assessment. This plan is currently in development and will include stakeholder engagement and consultation with:

- The community
- Government organisations
- Developers (risk and opportunities regarding integrated urban water management)
- Golden Grove Extractive industries; and
- Council's elected members.

Torrens Urban North East stormwater management plan

Council is partnering with the City of Port Adelaide-Enfield, Adelaide City Council and the Town of Walkerville a 'Torrens Urban North East' Stormwater Management Plan'.

The Torrens Urban North East SMP will provide a master plan for stormwater management in the catchments draining directly into the River Torrens on its north side. The plan will assist in managing flood risk, water quality and amenity associated with the river.

The project is estimated to be completed by mid-2028.

Water security strategy project

The water security strategy project is an initiative of the City of Tea Tree Gully that has been designed to ensure that:

- the City has ongoing access to reliable, secure water sources to meet its demand for non-potable water
- non-potable water systems deliver value-for-money (cost-competitiveness) as well as socio-economic and environmental community benefits.

This project follows a Recycled Water internal audit that was performed by KMPG. The project team is currently considering the existing functions of the recycled water network to prepare business case for investment in an optimised network.

Demand management plan

Demand for new services will be met through the management of existing assets, the upgrade and renewal of assets, the provision of new assets and demand management practices.

Asset types	Demand Driver	Demand management plan
Stormwater runoff from infill development within the City.	Design capacities of stormwater network exceeded.	Continue to implement Planning and Design code's stormwater overlay for new developments. Update stormwater network hydraulic modelling to assist with decision making and producing the necessary information for undertaking network design.
Increased stormwater contamination as a result of infill development.	Breach of EPA policy, impact on waterways used by the public.	Implement stormwater quality objectives for new developments. Look for opportunities for water-sensitive urban design in new developments and Council streetscapes and reserves.
Golden Grove Neighbourhood Code Amendment	Potential extension of the city's stormwater network and increased demand on creek and other infrastructure catchment in the upper Golden Grove area.	Council has commissioned a stormwater management study for the upper Golden Grove area to assess the impact of development and management options.
Dry Creek	To facilitate and support sustainable growth and development of the City while managing impacts of stormwater on Dry Creek.	Develop a stormwater management plan for Upper Dry Creek. Currently in progress (as of June 2024).
River Torrens	To facilitate and support sustainable growth and development of the City while managing impacts of stormwater on the River Torrens.	Partnering with other Councils to develop a stormwater management plan for the 'Torrens Urban North East catchments'. Currently in progress (led by City of Port Adelaide Enfield) to be completed by mid-2028.

Asset programs to meet demand

Growth

Urban development in the City of Tea Tree Gully has reached the boundary of the Hills Face Zone. The Golden Grove Neighbourhood Code Amendment may see an increase up to 1500 homes added to the region in future years, the largest since 'The Settlement' development (Golden Grove) in 2009. The size of the proposed development would see an extension of primarily our stormwater network, with stormwater assets being handed over to Council to manage, as well as the requirement to upgrade existing infrastructure to meet the demand of the development.

In response to the Golden Grove Neighbourhood Code Amendment, Council has acted to undertake a stormwater management study for the upper Golden Grove area.

At this stage, as this study is in development, there are no known financial impacts for the City of Tea Tree Gully to manage the demand from this development.

Recycled water capacity

Due to increased demand requirements of some irrigated parks, reserves and sports fields, as well as extensions of the recycled water network, parts of the network cannot deliver the required pressure and/or volume of water to irrigate effectively. Remediation of these issues would likely see 'on-site' storage facilities and pumping equipment to boost the production of irrigation systems. Instances of this have been included in the financial forecast for upgrade and new assets.

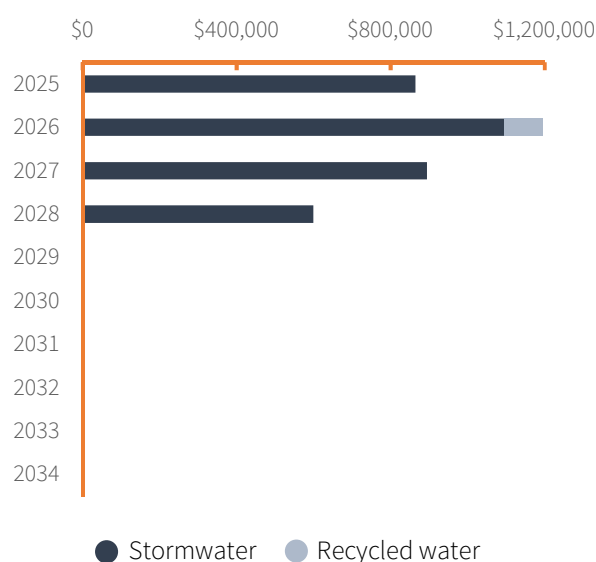
Flooding issues

Council collates information that informs requirements for localised stormwater upgrades to prevent future flooding issues when large rain events occur.

Known areas that are monitored are:

- Heather Drive (project in draft 2024-25 Annual Business Plan)
- Holden Hill Catchment including:
 - Chrysler Drive
 - Valiant Road
 - Gentilly Street
 - Gordini Crescent
 - Bentley Drive
 - Riley Street
 - Mercedes Drive
- Johinke Reserve/Brunel Drive
- Perseverance Road
- Green Valley Drive
- Molvig Avenue
- Sunnyview Crescent
- Ashley Avenue/Modbury Sports Area
- Scot Road/Avoca Street
- Maxlay Road
- Barracks Road
- Pedare Reserve (Tolley Court).

Upgrade and new assets to meet demand





Pump station equipment, Ladywood Reserve, Modbury North

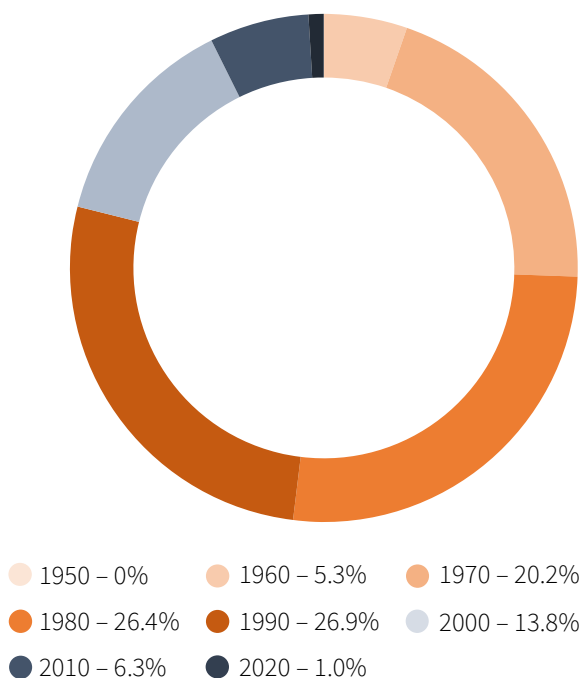
Lifecycle management

This section outlines asset performance and condition information, and uses asset management principles to develop broad strategies and specific work programs to achieve the agreed service levels.

The assets covered by this plan include:

- Stormwater pipes
- Stormwater pits (side entry pits, junction boxes)
- Culverts and channels
- Gross pollutant traps
- Wetlands
- Wynn Vale Dam
- Wastewater Treatment Plant
- Recycled water pipes and valves
- Pump stations (including all equipment)
- Bores
- Storage tanks.

Asset age profile by decade
(% based on asset cost)



Asset capacity and performance

To achieve the desired service levels, Council has developed a set of guiding design principles, which account for a variety of factors such as usage, location and environment.

Asset condition assessment

As part of routine maintenance, condition assessment is conducted on underground infrastructure through camera inspections, visual inspections and engineering assessments. This is to ensure the asset is achieving its desired functionality whilst also ensuring no risk to surrounding infrastructure through structural defects. Examples of defects include: joint movement in pipes resulting in sinkholes and cracking, or tree root intrusion in pipes resulting in blockages.

Hydraulic modelling

Hydraulic modelling data is not available to Council at present, however, modelling is in the scope of the Upper Dry Creek Stormwater Management Plan. Hydraulic modelling will provide Council with a greater understanding of stormwater capacity requirements within the city, which can be used to inform future capital works in collaboration with existing condition information.

Stormwater design standards

All new stormwater infrastructure conforms to industry design standards as outlined in the technical service levels section of the asset management plan. Stormwater infrastructure is designed to cater for the majority of minor events (1 in 5 AEP for residential). Designing to cater for more significant rain events would require significant budget as material and construction costs increase proportionally. Roads are designed to allow for holding of stormwater during more significant rain events (1 in 100 AEP) when underground infrastructure is at capacity.

Water quality

Water quality is monitored in accordance with EPA standards, with regular water quality testing conducted at various points along the City’s watercourses. Water quality testing enables Council to identify and address point sources of pollution along water courses. Council also operates multiple dams and basins which aid in the improvement of water quality through the removal of suspended solids. In addition, water sensitive urban design is incorporated into infrastructure designs which incorporate the use of natural filtration, plants and other landscaping to remove water pollutants.

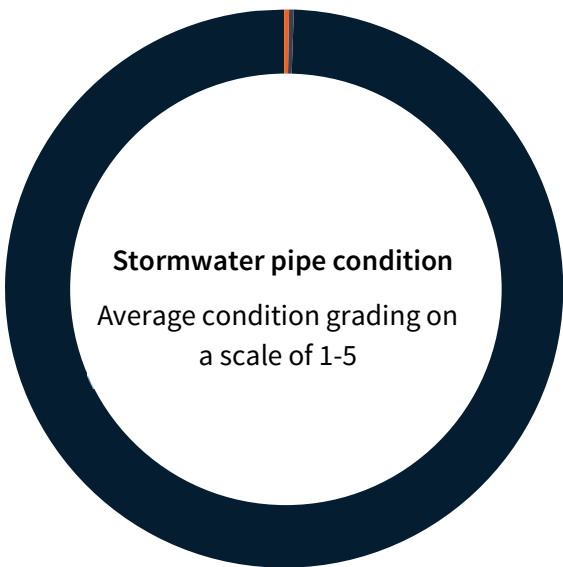
Asset condition

The regular collection of condition data allows us to make informed decisions and mitigate risk when formulating forward capital works programs. Asset condition is usually determined through field observations of defect parameters.

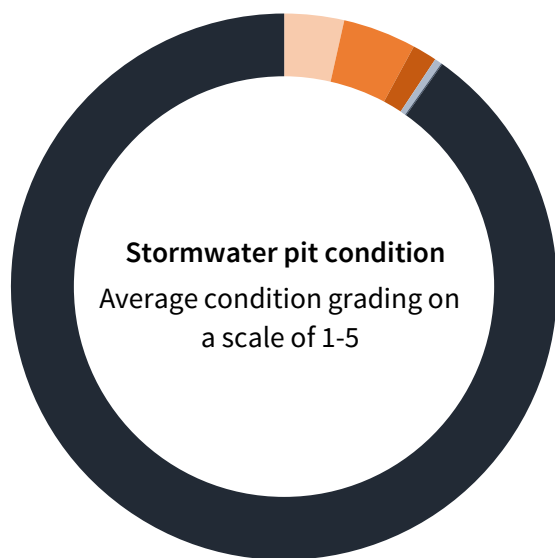
Asset conditions are measured using a 1-5 rating system where 1 relates to an asset that is ‘as new’ and 5 relates to an asset that is at the end of its useful life.

Condition grading

- 1. Very good**
New or like new, only planned maintenance required.
- 2. Good**
Minor maintenance required, plus planned maintenance.
- 3. Fair**
Significant maintenance required.
- 4. Poor**
Significant renewal/rehabilitation required
- 5. Very poor**
End of useful life and/or beyond rehabilitation.



- Very good – 0.01%
- Good – 0.13%
- Fair– 0.24%
- Poor – 0.99%
- Very poor – 0.1%
- Unknown – 99.43%



- Very good – 3.5%
- Good – 4.3%
- Fair – 1.5%
- Poor – 0.4%
- Very poor – 0.1%
- Unknown – 90.2%

Operations and Maintenance Plan

To improve the functionality of our stormwater assets, Council regularly undertakes operational activities such as pit and pipe cleaning, camera inspections (CCTV) and condition assessments.

While this work will not change the condition of the asset, it will help prolong its useful life.

Council also undertakes regular maintenance work including side entry pit frame repairs, lid replacements and patch repairs over small sections of damage assets. This work will improve the condition and functionality of assets and is necessary to keep them operational.

Maintenance works are classified as reactive and planned:

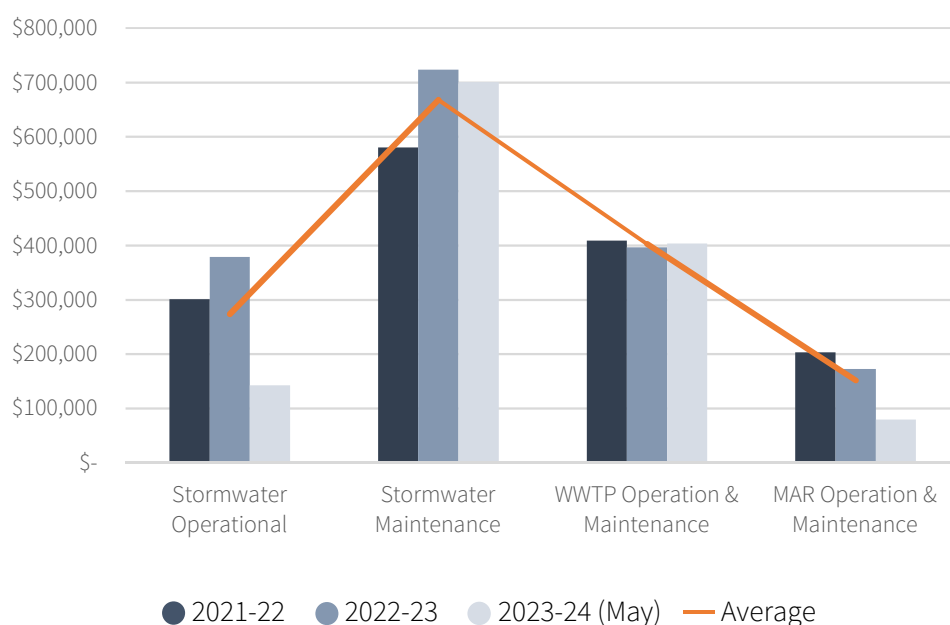
Reactive maintenance

Reactive maintenance is undertaken in response to customer requests or when assets fail and need immediate repair.

Planned maintenance

Planned maintenance relates to repair work that arises from proactive activities such as inspections and condition assessments, where actioning repair work is then prioritised, scheduled and reviewed against previous maintenance history.

Previous maintenance and operational expenditure



Renewal plan

Renewal is the process of restoring an existing asset to its original service potential. This does not usually increase the functionality or usability of the asset.

Assets requiring renewal or replacement are identified using the following methods:

- **Aged based-approach**
Using acquisition year and useful life to determine the renewal year.
- **Condition-based approach**
Using condition predictive modelling systems.
- **Manual-based approach**
Using a combination of visual inspections and maintenance history to determine the remaining useful life of the asset.

Renewal plan methods by asset type

Type of asset	Renewal/Replacement method
Stormwater pipes	Condition-based and aged-based
Stormwater pits	Condition-based and aged-based
Gross pollutant traps	Condition-based and aged-based
Wetlands/dams	Age-based
Wastewater treatment plant	Condition-based and manual based
Recycled water pipes and valves	Age-based and manual-based
Pump stations (including all equipment)	Age-based and manual-based
Bores	Age-based
Storage tanks	Age-based

Renewal prioritisation drivers

Asset renewal and replacement is typically undertaken in accordance with two major community expectations in mind:

Reliability

The asset can reliably deliver the service it was constructed to do so (e.g. renewing a pipe so that water is properly drained and minimising its effect on other assets such as footpaths, roads, properties etc.)

Quality

The asset is of sufficient quality to meet community service levels (e.g. able to drain stormwater away efficiently).

Renewal prioritisation

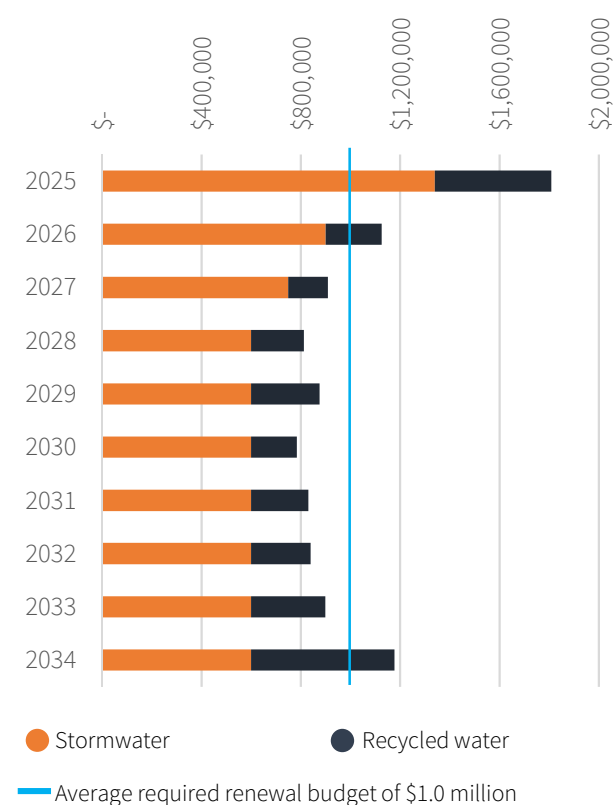
The renewal of an existing asset is prioritised using the following criteria:

- **Risk**
The consequence of asset failure is high.
- **Consumer usage**
The asset is highly used and the subsequent impact on users would be greatest.
- **High cost asset**
Total value represents the greatest net value to the organisation.
- **Age profile**
The asset is close to the end of its useful life.
- **Maintenance**
The asset has high operational or maintenance costs.
- **Community expectations**
Asset renewal would provide better service levels.

Future renewal and replacement expenditure summary

Projected future renewal and replacement expenditures are shown in the below graph.

Projected capital renewal and replacement expenditure



The projected capital expenditure shows a peak in year one, where assets that are in poor to very poor condition require renewal. As stormwater assets have long useful lives, there is minimal effect on required renewal expenditure over a 10-year planning period.

An amount of \$250,000 per year is required for stormwater unplanned renewals and \$150,000 for recycled water, where asset failure occurs that could not be predicted. It is demanding to visually assess all underground assets in a timely manner to determine the condition to predict asset failure. Poor construction methods or expansive soils can contribute to an underground asset like stormwater pipes not reaching its useful life potential. The nature of recycled water equipment, such as pumps and electrical items, renewal requirements may occur without signs of poor condition leading to failure.

The budgeted renewal expenditure (from the long-term financial plan) is approximately \$2.4 million per year via depreciation of water assets, however, this does not closely relate to the amount required for capital renewals. As a majority of the stormwater network was constructed in the 1970s through to 1990s, assets are only 30 to 50 years old, and from an age approach, still have a medium-to-long remaining useful life, and not requiring significant large-scale renewal at this time.

Below is the projected capital renewal expenditure over the 10-year planning period for each asset type.

Renewal expenditure by asset type

Type of asset	Renewal expenditure
Stormwater (planned)	\$4,690,000
Stormwater (unplanned)	\$2,500,000
Recycled water (planned)	\$1,378,450
Recycled water (unplanned)	\$1,500,000
Total	\$10,068,450

Assets identified for renewal and/or replacement may be deferred in capital works programs if the cost is not able to be funded. This can be the case when there is a backlog of assets to be renewed, higher priority projects are required for other assets classes, or upgrade/new works have been committed based on consumer preferences, e.g. strategic projects.

Deferring the renewal of an asset may not impact its short-term performance. If work is deferred for a prolonged period of time, the cost of renewal may increase as the asset deteriorates, which could lead to potential environmental and safety issues.

Creation/Acquisition/Upgrade plan

The creation of a new asset or works that improves an asset beyond its current capacity may result from growth, social or environmental needs. These additional assets are considered in the future demand section of this plan.

The upgrade or expansion of existing assets are identified from various sources such as community or Elected Member requests, proposals identified from strategic plans or partnerships with other organisations. Project proposals are investigated to verify the need and to develop a preliminary budget estimate. Project proposals that are approved are ranked by priority and available funds and scheduled in future works programs.

Asset disposal plan

Disposal includes any activity associated with the disposal of a decommissioned asset including sale, demolition or relocation. At this time, City of Tea Tree Gully has no set plans to decommission any water services.



Wetland area, Gifford Reserve, St Agnes

Risk management

Effective risk management is integral to all aspects of Council business including how infrastructure assets risks are identified and managed.



The risk assessment process which is aligned to the Risk Management Standard ISO 31000:2018 – Guidelines provides the logical approach for the identification, assessment and management of risks in order to protect Council’s assets and to minimise risks to the community.

Once risks have been assessed and rated, for the most significant risks (those rated as high or extreme), treatment options must be considered and implemented. Risks identified as moderate or low are monitored and reviewed to determine if circumstances change.

The following risk management principles have been applied to our water infrastructure assets:

- Integration of risk management in all decision making and business processes
- Applying a systematic and structured approach to manage risks
- A tailored risk management approach to suit the context
- Applying an evidence-based approach in assessing and mitigating risks
- Determining the Council’s risk tolerance

- Applying a transparent and inclusive approach in the management of risks
- Applying risk management practices to continuously improve City of Tea Tree Gully’s operations.

Risk identification

For water assets, risks can be identified from a number of sources:

- Minor operational routine inspections
- Major condition/defect inspections
- Customer requests
- History of performance
- Stakeholder advice.

Risk analysis

The City of Tea Tree Gully uses a risk assessment matrix (as pictured below) that is designed to define the level of risk by combining the consequence and the likelihood to arrive at a risk rating.

Risk treatment

All risks that have been assessed as having an extreme or high-risk rating require the implementation of mitigation strategies and/or risk treatment options (controls). The residual risk rating and treatment cost post implementation of treatment/controls is shown in the table on the next page.

Consequence	Likelihood				
	Rare	Unlikely	Possible	Likely	Almost certain
Critical	High	High	Extreme	Extreme	Extreme
Major	Medium	Medium	High	High	Extreme
Moderate	Medium	Medium	Medium	High	High
Minor	Low	Low	Medium	Medium	Medium
Insignificant	Low	Low	Low	Low	Low

Critical risks and treatment strategies

Service or asset at risk	What can happen	Risk rating	Risk treatment strategies/control	Residual risk *	Treatment costs
Stormwater drainage network	Localised flooding and inefficient management of stormwater due to infrastructure blockages.	High	Preventative maintenance of side entry pits. Reactive pipe clearing using high pressure water jet.	Medium	\$120,000 per year
	Poor understanding of stormwater drainage network assets – can result in: • Multiple asset failures • Poor financial forecast/budgeting • Flooding • Incorrectly designed assets.	High	1. Implement condition assessment program of stormwater structures and pipes 2. Hydraulic modelling and hydraulic assessment of stormwater catchments 3. Complete catchment wide risk assessment 4. Implement an ongoing rehabilitation program for repair and maintenance of stormwater assets.	Medium	Condition assessment program \$50,000 per year. Development of hydraulic model and hydraulic assessment of stormwater catchments (a part of the Upper Dry Creek SMP)
Watercourses (Dry Creek, Cobbler Creek etc.)	Increased flow rates in creeks resulting in bank failure and flooding.	High	Planning and Design Code Stormwater Overlay. Monitoring creek flows during storm events. Hydraulic assessment of creeks and waterways.	Medium	Within existing resources / budgets
	Overgrown reeds choking natural waterways resulting in flooding in adjacent areas.	High	Maintenance of 3 major sites per annum.	Low	Within existing resources/ budgets.

Service or asset at risk	What can happen	Risk rating	Risk treatment strategies/control	Residual risk *	Treatment costs
Detention Basins/ Wetlands/ Dams	Increase risk of blue green algae events due to sediment and high nutrient loads: damage to environment and loss of public amenity, public health risk from blue green algae toxins, odour issues. Increase risk of dam stratification due to build-up of sludge and organic material at the bottom of the dam, which promotes blue green algae events.	High	De-silting of wetlands, basins and dams.	Medium	Within existing resources/ budgets.
Dam breach	Breach of Wynn Vale Dam wall causing damage and loss downstream of the dam.	Extreme	Consider recommendations from the dam audit and develop options to reduce the risk to the community. Undertake weekly dam inspections to monitor any changes to the dam wall and surrounds Where possible, install telemetry to remote monitoring capability.	High	Telemetry \$3,000 per annum. Weekly inspections - Within existing resources/ budgets.
Wastewater Treatment Plant	The process of primary and tertiary processes for treating wastewater is not possible due to failure of equipment at the Wastewater Treatment Plant.	High	Equipment at the plant is inspected on a scheduled basis, and backup equipment can be implemented to ensure the treatment process continues.	Medium	Within existing resources/ budgets Allocation of unplanned renewal expenditure when required.

Service or asset at risk	What can happen	Risk rating	Risk treatment strategies/control	Residual risk *	Treatment costs
Recycled water distribution	The demand for water consumption cannot be serviced by the distribution network resulting in reliance on mains water.	High	Continue to monitor the flow rates of the network to ensure that the requirements downstream of the supply are being met (e.g. irrigation system performing effectively).	Medium	Within existing resources/ budgets.



Pump station shed, Banksia Park Sports Area, Banksia Park

Financial summary

This section contains the financial requirements resulting from all the information presented in the previous sections of this asset management plan.

Asset valuations

The value of our water assets as at 1st June 2024 is shown below.

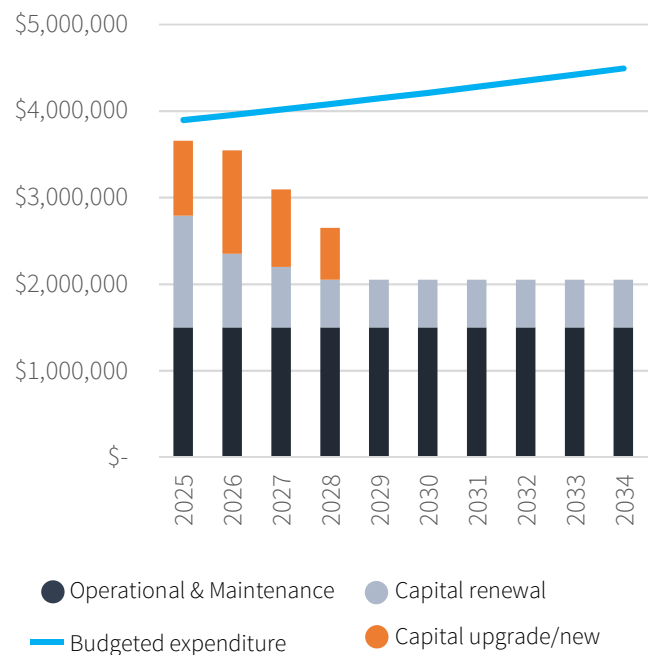
Asset type	Current replacement cost	Depreciated replacement cost	Accumulated depreciation	Depreciation expense
Stormwater Conduits	\$159,067,110	\$127,725,128	\$31,341,982	\$1,316,973
Stormwater Structures	\$67,158,545	\$56,432,566	\$10,725,979	\$455,519
Recycled Water	\$32,802,850	\$27,965,917	\$4,836,933	\$604,929
Wetlands and Basins	\$3,539,570	\$3,245,203	\$294,367	\$19,316

Financial projections

This plan sets out the projected operations, maintenance and capital renewal expenditure required to provide the agreed service levels to the community over a 10-year period in a sustainable manner and informs our Long-Term Financial Plan.

The projected operations, maintenance and capital renewal expenditure required over the 10-year planning period is \$2.52 million on average per year.

Estimated (budget) operations, maintenance and capital renewal and upgrade/new funding is \$4.18 million on average per year giving a 10-year funding surplus of \$1.66 million per year.



Asset renewal funding ratio

Forecasts of the Asset renewal funding ratio (Long-Term Financial Plan renewal budget/Projected capital renewal and replacement expenditure) indicate that Council expects to have 100% of the funds required for the optimal renewal and replacement of assets over the next 10-years.

Knowing the extent and timing of any required increase in expenditure and knowing the service level consequences if funding is not available will assist in providing services in a financially sustainable manner.

A key tool in financial forecasting will be modelling the predictive behaviour of assets. Testing and verifying the intervention variables will determine if an increase in funding is required, or whether the serviceability of assets is decreased due to the budget allocation from the Long-Term Financial Plan.

Key assumptions made in financial forecasts

Key assumptions made in this asset management plan are:

- Asset values are based on valuations data performed by APV Valuers and Asset Management.
- The required renewal expenditure assumes that the community is content with the current levels of service across the entire asset class. Should these levels of service be refined through future community consultation, it could have a significant impact on the intervention levels used and funding required.
- The Long-Term Financial Plan is grouped by asset type, and is based upon the depreciation expense values.
- Replacement works will be valued based on actual costs of work, e.g. predictive modelling of roads determines the treatment cost input into the modelling software, and not the current replacement cost.
- The assumed useful lives of assets will be achieved.
- All assets with the same construction/material type will deteriorate at the same rate regardless of locational or environmental considerations.

- It is understood that the Long-Term Financial Plan funding values are subject to change year upon year based upon expenditure in other sections of Council, not just asset management related expenditure.

Forecast reliability and confidence

The expenditure and valuation projections in this plan are based on best available data. The estimated confidence level of this data is considered to be reliable (level B), using the five-level scale below.

A. Highly reliable

Data based on sound records, procedures, investigations and analysis, documented properly and agreed as the best method of assessment. Dataset is complete and estimated to be accurate $\pm 2\%$.

B. Reliable

Data based on sound records, procedures, investigations and analysis, documented properly but has minor shortcomings, for example some of the data is old, some documentation is missing and/or reliance is placed on unconfirmed reports or some extrapolation. Dataset is complete and estimated to be accurate $\pm 10\%$.

C. Uncertain

Data based on sound records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolated from a limited sample for which grade A or B data are available. Dataset is substantially complete (up to 50% is extrapolated data) and estimated to be accurate $\pm 25\%$.

D. Very uncertain

Data is based on unconfirmed verbal reports and/or cursory inspections and analysis. Dataset may not be fully complete and most data is estimated or extrapolated. Dataset has an estimated accuracy $\pm 40\%$.

E. Unknown

No or very little data held.

Plan improvement & monitoring

The figures within this plan will be reviewed annually as part of our Long-Term Financial Plan review process and will be amended to recognise any changes in service levels, valuations, conditions and/or resources available to provide those services.

Status of asset management practices

Accounting and financial systems

Council uses TechOne to manage financial information.

Financial transactions are processed using TechOne against financial assets, which update financial depreciation values as the transactions are performed.

Accounting standards and regulations

The Australian Accounting Standards provide the benchmark against which we report on asset accounting.

Asset management systems

Council uses TechOne to manage asset information. This system integrates with our GIS system (ESRI) and our Customer Request Management system. (Salesforce)

Our asset register contains important asset information such as material, construction date, and hierarchy, which is used to develop this asset management plan and to forecast the renewal of our assets.

Improvement plan

The asset management improvement plan generated from this asset management plan is shown on the next page.

Monitoring and review procedures

The Water Asset Management Plan is reviewed annually, during the annual business plan and budget process, to ensure it reflects:

- Current service levels
- Actual asset values
- Projected operations, maintenance, capital renewal and replacement
- Capital upgrade/new and asset disposal expenditures
- Projected expenditure values incorporated into the Long-Term Financial Plan
- Any changes to the available resources and the resultant service levels.

The plan is for a ten-year planning period and is due for full revision and updating within two years of each Council election.

Performance measures

The effectiveness of the asset management plan can be measured in the following ways:

- The degree to which the required projected expenditure identified in the asset management plan are incorporated into the Long-Term Financial Plan.
- The degree to which the works programs, budgets, business plans and corporate structures consider the 'global' works program trends provided by the asset management plan.

Asset management improvement plan

	Task	Responsibility	Resources required	Timeline
1	Undertake condition assessment of stormwater assets and implement a three-year rolling rehabilitation program and capital works program.	Technical & Engineering Services	CCTV inspections \$50,000 per year Internal staff	Ongoing
2	Update register of blockages and inspections against pipes electronically using asset management software to inform proactive cleaning/inspection program.	Technical & Engineering Services	Internal staff	December 2025
3	Update floodplain mapping for upper Dry Creek.	City Strategy	Project manager (internal). Engineering consultant (external). Additional budget required	June 2026
4	Structural review of Council's stormwater culverts to develop and implement a framework for risk management	Technical & Engineering Services City Strategy	Project manager (internal). Consultant (external). Additional budget required.	June 2026
5	Centralise all recorded CCTV data and reports for stormwater pipes to be easily viewed by internal staff	Technical & Engineering Services	Internal staff	December 2025
6	Develop the process to collect asset data and assess equipment at treatment plants, bores and pump stations	Technical & Engineering Services	Internal staff	December 2025
7	Capture watercourses within the city by mapping (GIS) and creating asset register in Council's asset management system	Technical & Engineering Services	Internal staff	June 2025

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