SA Water

Our 30-year Asset Investment Plan

Ensuring reliable assets and service continuity

30 June 2023

Government of South Australia

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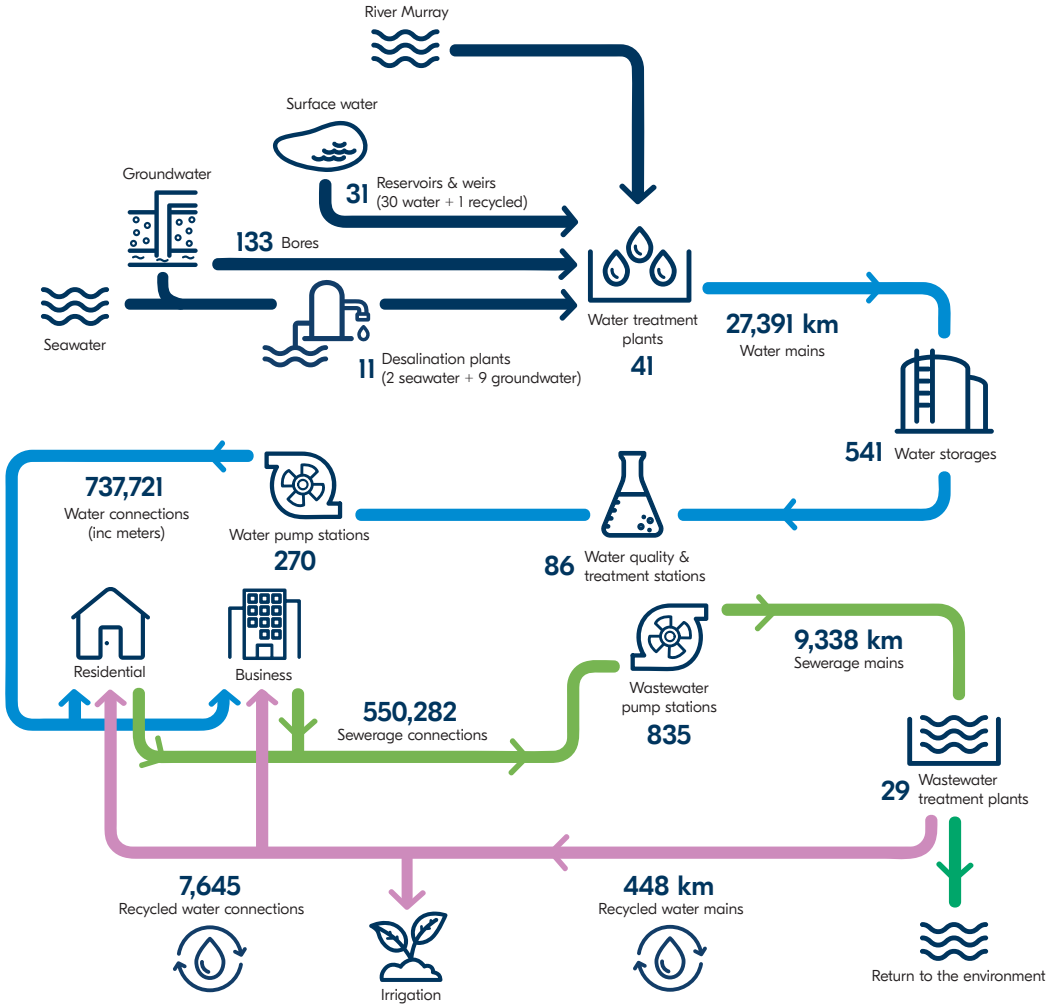
Assets overview

We deliver essential water and wastewater services to more than 1.8 million South Australians. As custodians of South Australia's water and wastewater supply and network, we operate more than $14 billion of assets including more than 27,000 kilometres of water mains, more than 9,000 kilometres of wastewater mains, and more than 400 kilometres of recycled water mains. We also maintain and operate close to 1,000 facilities to extract, treat, store and supply water, and almost 800 facilities to remove and process wastewater, recycling and reusing a portion of it while safely discharging the rest to the environment (as shown in figure 1).

To meet our legal and regulatory responsibilities, this intricate network requires constant investment to create, sustain and renew assets to keep up with the demand for our services. We are continually improving the way we plan our investments with long-term projections, helping us to achieve efficiencies in the delivery of our investments. We remain focused on delivering what is most important to our customers, which is providing reliable services, while keeping prices low and stable over time.



Correct as at August 2023

Figure 1: Overview of our networks and assets

Our Strategy 2020-25

Our Strategy 2020-25 (as shown in figure 2) sets a clear direction for our business. While charting our course for five years, we maintain a long-term view of at least 30 years into the future. We understand that the decisions we make today can have a long-term impact on the wellbeing of our customers, community, and the future sustainability of South Australia.

Our strategy is framed by our vision and structured around five strategic focus areas.

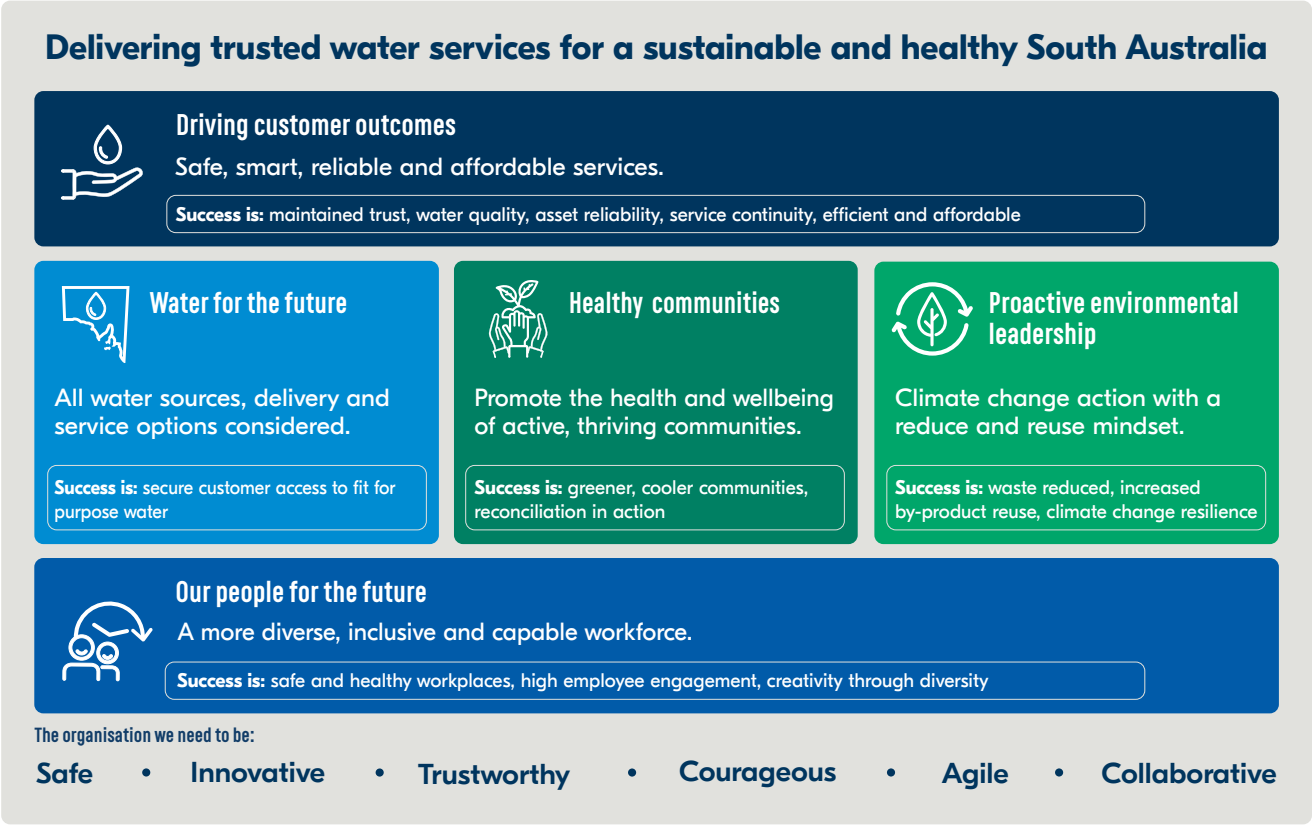


Figure 2: Our Strategy 2020-25

Our asset management system for the future

We manage our assets to deliver the services our customers and regulators expect, while managing risks and ensuring the cost of delivery is sustainable over the lifetime of each asset. Assets range from intangible ones such as systems models and master plans, to tangible ones such as pumps, motors, control panels, as well as treatment plants and pump stations.

From strategy to investment, our assets are managed with a line-of-sight model (as shown in figure 3) to ensure that the investments align with the strategy. The levels of service metrics developed around customer objectives constantly track compliance and performance.

Defined targets assist in focussing on the risks that affect the delivery of the service levels and determine the required urgency for resolution. Short-term asset investment plans are developed over one to two regulatory business periods to address these risks. A long-term asset investment projection is developed and guided by sources including long-term master plans, climate projections, population growth trends, current asset age and condition, and changes in environmental and regulatory requirements.

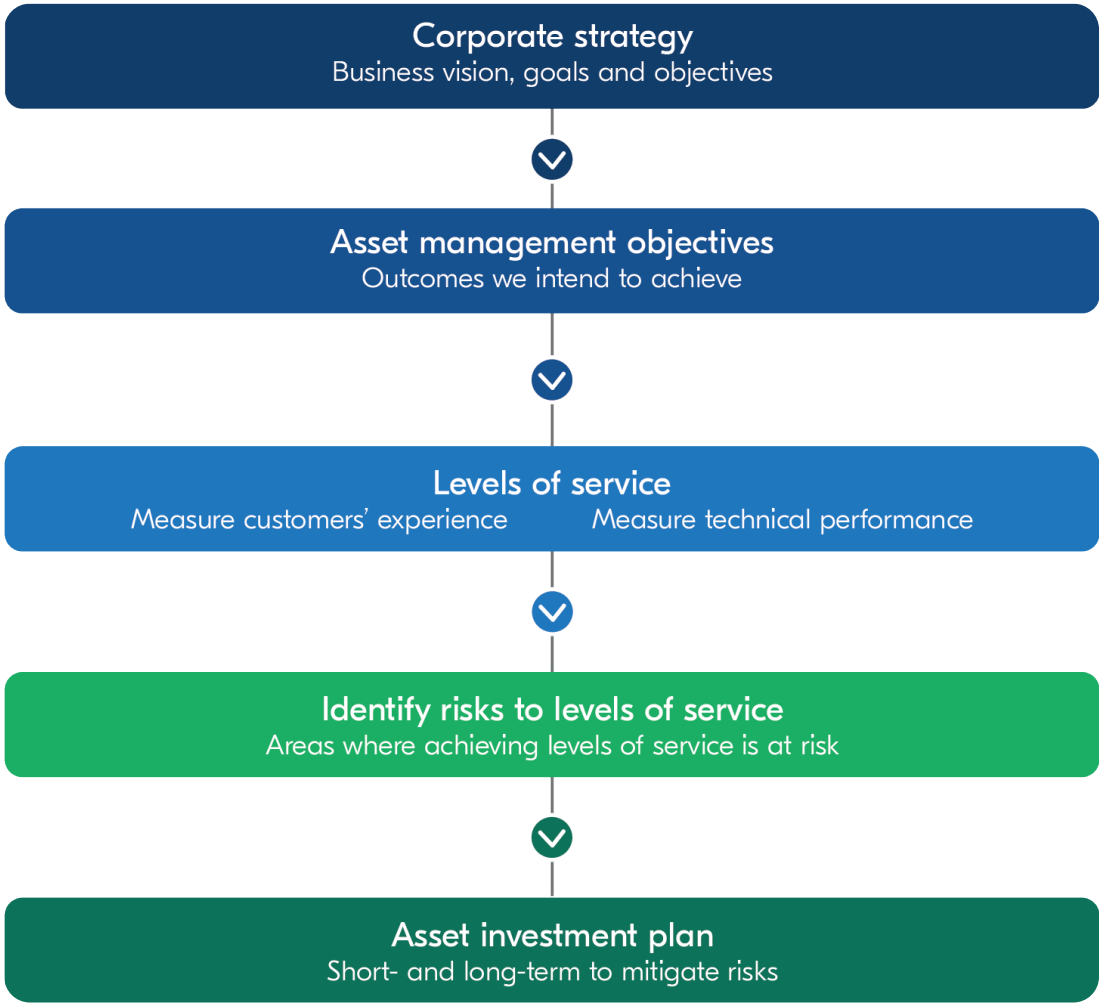


Figure 3: Line-of-sight model - from strategy to investment

Levels of service

Levels of service are based on customers' expectations and feedback, along with legislative requirements including acts, regulations, standards, and codes of practice.

There are two types of levels of service:

1. How customers receive or experience the product or service supplied by us. Examples include the frequency of an incident occurring and impacting them, how quickly incidents are attended to, and the quality of the service our customer receives.
2. Technical levels of service focus on asset-based metrics, such as its reliability and availability, and how to minimise loss of product or service quality.

Investments in both can involve asset renewals, augmentations or the creation of new assets to achieve the required levels of service, including:

- projects to relay ageing mains to minimise temporary unplanned interruptions
- adding odour control units at odour hotspots to reduce impact on receiving customers
- conducting major renewals at treatment plants for structures, filters and process equipment to extend their useful life and minimise unplanned equipment failure that may result in service interruption.

Risk-based investment prioritisation process

Risks can arise with asset deterioration through normal use or accelerated wear from operating conditions or environment. As assets reach their useful life limits, age-based and inspection-refined condition assessments help identify risks of accelerating, maintaining or deferring asset renewals.

With the network and facilities having a set capacity, there is a risk to the service supply to customers when the growth in demand for the region is projected to exceed the capacity of the system. Investments, including duplicating mains, increasing treatment and expanding pump station capacity, can be made to the network and relevant facilities before each system reaches that point.

Risks related to our external responsibilities are generally from non-compliance with regulations or directives from our regulators, such as environment or health.

Investment supports improvements to our assets to help us better address these risks, such as improving asset condition, capacity, or functionality.

Once the risks associated with operating our assets to the required levels of service are understood, the cost of mitigating the risk and the most efficient timeframe are identified.

Excessively early renewals increase overall investments unnecessarily, while planning for renewals too late, results in increased breakdown response and costs, and an inability to achieve levels of service.

These investments are prioritised by risk, levels of service and cost. As shown in figure 4 we start out with a technical investment plan with a full array of identified investments. Prioritisation processes then enable the generation of a prudent and efficient investment plan. This is presented to the regulators and following discussions, a final investment plan is approved. Investments that have not been approved are considered deferred and pushed to later RBPs for delivery.

Note: All graphs and figures presented in this iteration of the 30-year asset investment projection represent the long-term asset investment projection aligned with the proposed Regulatory Determination 2024-28 submission.

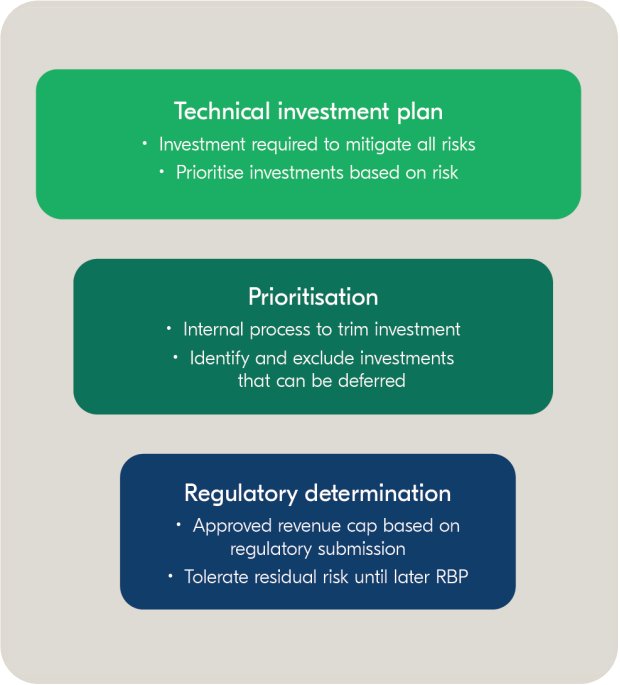


Figure 4: Risk stratification - prioritising investments

Investment drivers

As we develop our 30-year asset investment projection, we structure investments into three broad categories, based on the primary driver behind each:

1. asset renewals
2. growth
3. external responsibilities.

While the three drivers are common across both water and wastewater, the distribution of investments exhibit a different focus against each of these drivers. For example, over the regulatory periods from 2024 to 2052, asset renewals make up more than 58 per cent of all investment in the water portfolio, representing a much larger segment of the overall water assets investment, as compared to only 43 per cent in wastewater. Conversely, there is an increased focus on external responsibilities within the wastewater investment portfolio, making up 25 per cent of the overall investment as compared to only 21 per cent in the water asset investment space.

Asset renewals

Asset renewal investment ensures we can maintain our services as our assets deteriorate with age. Projection trends for asset renewals and replacement, are based on the condition and performance assessment profile of our asset base.

Assets are regularly inspected or tested and graded, from excellent to very poor, which relates to the integrity and quality of the asset. The grading is considered against the expected remaining asset life. Assets in excellent condition are 'as new' and have more than 90 per cent of their life left. For some assets, such as wastewater trunk mains, this may be more than 50 years. Others, such as electronics, can be less than five years. Assets in a very poor condition have a remaining asset life of less than 12 months. Before renewal, a review also considers if the asset is still required, sized appropriately for its application, and if there are other more appropriate solutions available to improve growth or compliance requirements.

Growth

Investment in growth ensures our infrastructure can accommodate a growing population, while expanding our services to new and existing customers through the expansion of our water and wastewater networks and treatment facilities.

Current and predicted future capacity and performance of our assets is regularly reviewed, assessed, and updated in our master plans. Systems, modelling processes and detailed analysis ensure that we continue to sustainably meet ever-changing demand.

Population can grow in both density and distribution, typically at a varying rates across each of the systems we operate, and between water and wastewater systems. This increases the complexity with which growth investments are projected. It is therefore important to work closely with tiers of government and customers to provide more accurate projections for the longer-term, while remaining agile to review, renew and refocus investments as they draw near.

Investment drivers

External responsibilities

As we mature in our planning capabilities, there is a heightened awareness of the social and environmental impact of our assets. Improving safety considerations of assets such as dams or reducing odour along the wastewater network contribute to the responsibility we have towards our customers and the environment.

With a sound understanding of our legal and regulatory responsibilities, we plan for ongoing investments into assets that allow us to address these responsibilities. We consider current trends and historical investments to project future regulation changes or policy shifts. The levels of investment required in future regulatory periods need to address external responsibilities, and we proactively allocate budget for potentially emerging issues.

Long-term assets investment

Our 30-year assets investment projection for water and wastewater infrastructure reflects the 2024-28 regulatory submission proposal (RD24) on what is required to mitigate risks inherent in our systems, or those that have emerged in recent years and not accommodated in past investments.

Long-term asset investment projections are the cost of investments, differentiated by driver and asset types, in today's dollars. The projections are regularly reviewed and updated to reflect risk changes within the business. Developed through several methods, this projection represents the current outlook based on established and anticipated risks.

Informed by the Corporation's long-term asset management planning and renewal approaches, the approach aligns with ESCOSA's primary objective, specified in section 6 of the Essential Services Commission Act 2002, which is "protection of the long-term interests of South Australian consumers with respect to price, quality and reliability of essential services."

Increased investments across all investment segments of the business are anticipated in the near future, with deferrals driven by increased cost-of-delivery and increased clarity of the scope and magnitude of risks in the immediate future.

The expenditure proposed for RD24 balances immediate risks to infrastructure and maintaining current service standards, with the costs paid by customers. The reduced investment cap in the current regulatory period is creating increased pressure for future investment. This has been exacerbated by deferrals in the current period due to external factors. Left unaddressed, these deficits will grow, leading to higher amounts for future investment in coming regulatory periods, while also increasing operating expenditure until these ageing assets are addressed.

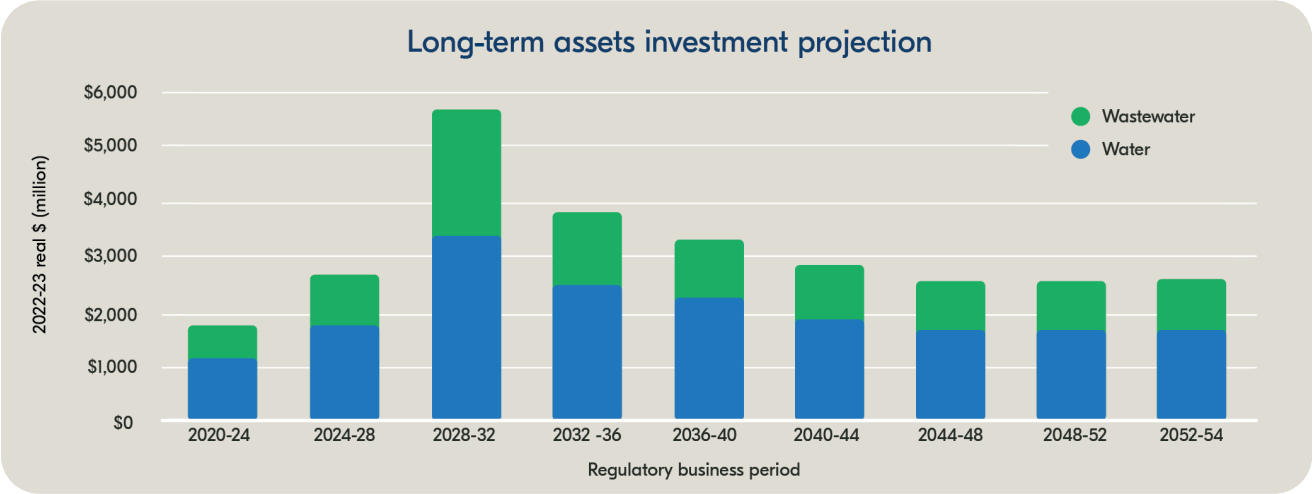


Figure 5: Long-term projection of capital investments across all assets for each regulatory business period

In the short term, a decision has been made to prioritise affordability for customers without substantially addressing these long-term pressures. Reflecting the risk-based investment prioritisation process, a consolidated investment overview across water and wastewater assets seeks to address the risks to delivering on our levels of service (as shown in figure 5). The presented investment in 2024-28 regulatory period represents the Prioritised Technical Investment Plan. Investing sufficiently in the earlier periods within this projection will be key in achieving a respite in size and urgency of investments required in the outer years.

This Prioritised Technical Investment Plan reflects a reduction of investments in preparation for the 2024-28 regulatory period. However, there is a need to invest sufficiently in the immediate future to avoid holding long-term high risks and ensure intergenerational equity to achieve customer levels of service.

Long-term assets investment

A robust and agile system captures and updates investment requirements, and profiles are regularly reviewed and updated to ensure an appropriate balance is achieved between cost and the risk of inability to deliver on levels of service. Detailed information is available for the short term whereas investment profiles in later years rely on projections and assumptions founded upon historical trends and available data.

Priorities are updated as they emerge, including shifts in the risk profile based on:

- newly acquired data through inspections and condition assessments
- changes to customer, community, and stakeholder expectations
- changes to regulatory requirements
- changes in market forces that affect our capability or cost to deliver.

Current estimates for investment required within future periods exceed the investment profile for the current period of 2020-24, representing a historical investment profile that may require reconsideration to mitigate future compounding risk.

Water asset investment projections

The projected long-term capital investment in our water assets is estimated at $16.36 billion between and including regulatory periods 2024-28 and 2052-56, or an equivalent of $2.05 billion per regulatory period. In the current regulatory period 2020-24, $1.2 billion was allocated to capital expenditure:

- 65 per cent for the renewal and replacement of existing assets to ensure the sustained delivery of services
- 19 per cent to augment and expand our water systems to meet future demand
- 16 per cent to deliver on external responsibilities and meet customer and stakeholder expectations.

Increased levels of investments in growth and external responsibilities drivers which represent approximately 35 per cent of the current investment portfolio are projected to increase to approximately 57 per cent in the 2028-32 period before returning back to 31 per cent in the outer years (as shown in figure 6).

Significantly higher short-term investment is projected, representing an accumulated backlog (due to investment deferrals and de-prioritisation in current and previous business periods) of asset renewal and replacement and external responsibilities (as shown in figure 6 and table 1). A long-term average represents approximately a 71 per cent increase in investment required in each period compared to regulatory period 2020-24.

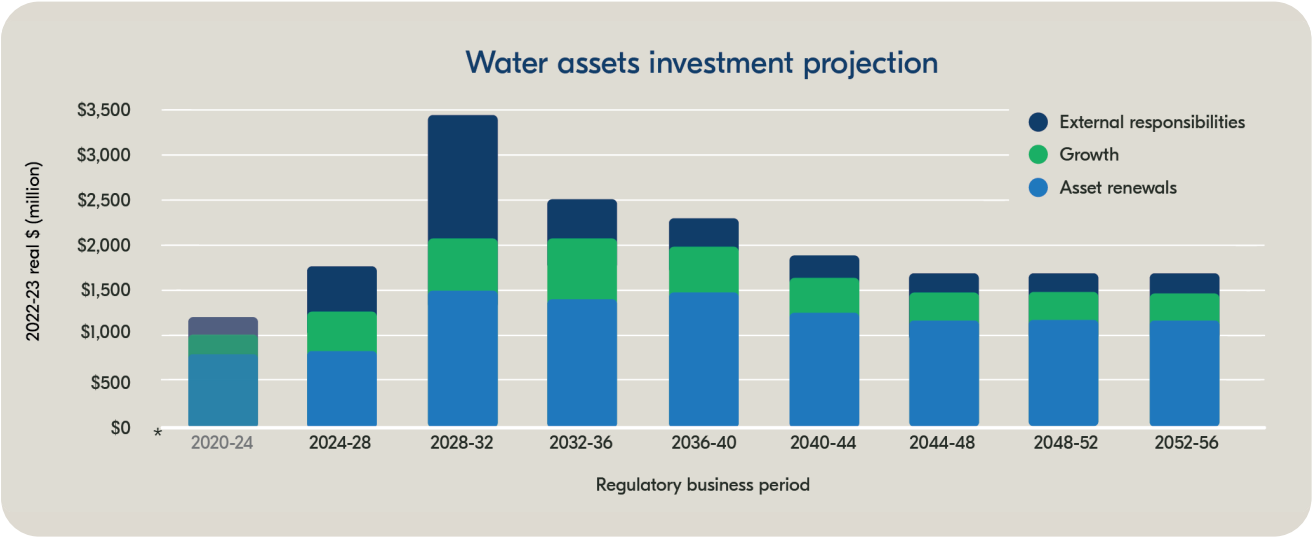


Figure 6: Water assets capital investments

* Investment for RBP20 is based on regulatory determination 20. Values beyond RBP24 are indicative only.

Table 1: Water assets investment projections

Driver	Current 2020-24	Short-term 2024-28	Medium-term 2024-28 to 2028-32	Long-term 2024-28 to 2052-56
Asset renewals (average $ million/period)	773	856	1,153	1,195
Growth (average $ million/period)	231	450	491	415
External responsibilities (average $ million/period)	192	495	934	436
Total average ($ million/period)	**1,196**	**1,801**	**2,578**	**2,046**

Wastewater asset investment projections

The projected long-term capital investment in our wastewater assets is estimated at $9.25 billion between and including regulatory periods 2024-28 and 2052-56, or an equivalent of $1.16 billion per regulatory period. In the current 2020-24 regulatory period, $564 million was allocated to capital expenditure:

- 46 per cent for the renewal and replacement of existing assets to ensure the sustained delivery of services
- 33 per cent to augment and expand our wastewater systems to meet future demand
- 21 per cent to deliver on external responsibilities and meet customer and stakeholder expectations.

A significant proportion of wastewater investments is allocated to growth, representing increased investment required to keep up with an increasing population.

Significantly higher investment in wastewater assets is projected, to address accelerated growth, particularly at the outskirts of our existing networks such as the Metro North region, with long-term averages approximately double the investment of the current 2020-24 regulatory period (as shown in figure 7 and table 2).

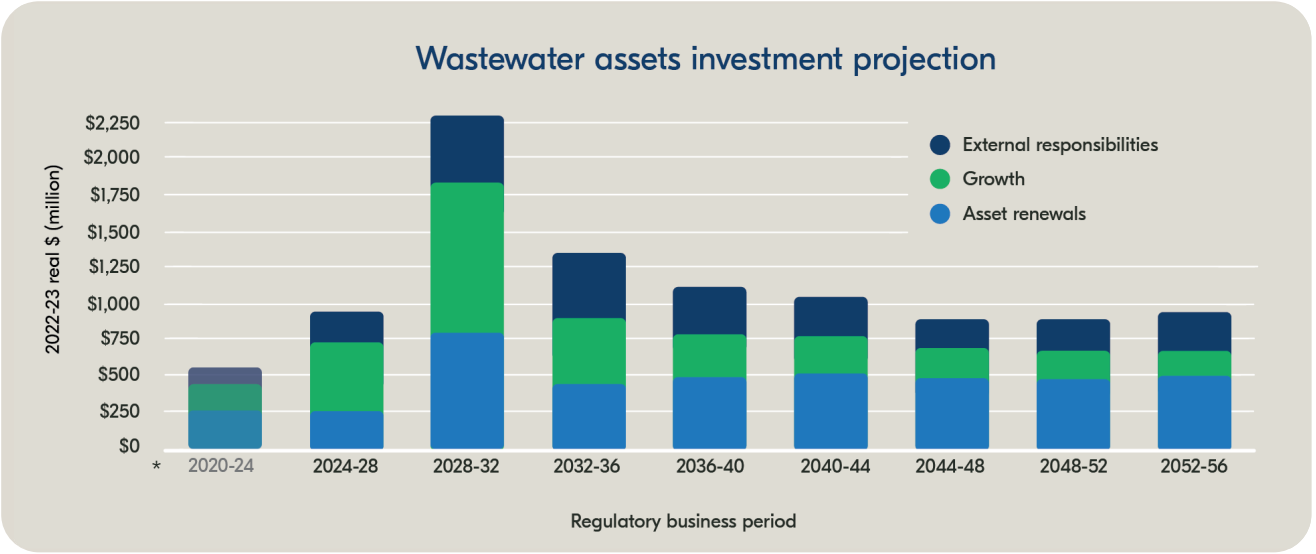


Figure 7: Wastewater assets capital investments for each regulatory business period

* Investment for RBP20 is based on regulatory determination 20. Values beyond RBP24 are indicative only.

Table 2: Wastewater assets investment projections

Driver	Current 2020-24	Short-term 2024-28	Medium-term 2024-28 to 2028-32	Long-term 2024-28 to 2052-56
Asset renewals (average $ million/period)	262	254	516	496
Growth (average $ million/period)	184	479	678	366
External responsibilities (average $ million/period)	118	207	331	294
Total average ($ million/period)	**564**	**940**	**1,525**	**1,156**

Asset renewals

Asset renewal ensures the continuity of service for our customers and represents approximately 58 per cent of long-term water investments and 43 per cent of long-term wastewater investments.

Assets being renewed fall into one of two categories:

1. Linear assets, including trunk mains, distribution mains, reticulation mains, ancillaries and cathodic protection:
    - 22 per cent of water asset renewal investments
    - 50 per cent of wastewater asset renewal investments.
2. Non-linear assets, including treatment plants, dosing stations, pump stations, control installations, tanks and earth-bank storages:
    - 78 per cent of water asset renewal investments
    - 50 per cent of wastewater asset renewal investments.

Asset renewals

Linear assets

Short-term investment in linear assets is informed by condition assessments and performance data to enable optimal renewal of assets, while minimising customer impacts. Age-based and condition-based data, projections for estimated replacement based on installation date, and the useful life of the pipe material informs the renewal of linear assets schedule in the medium and long-term (as shown in figure 8).

Much of South Australia's water and wastewater linear networks were installed in concurrent years in the mid 20th century, and has a useful life of approximately 100 years (dependent on material). Significant proportions of the network are therefore reaching the end of their useful life in a similar period (as shown in figure 9 and figure 10).

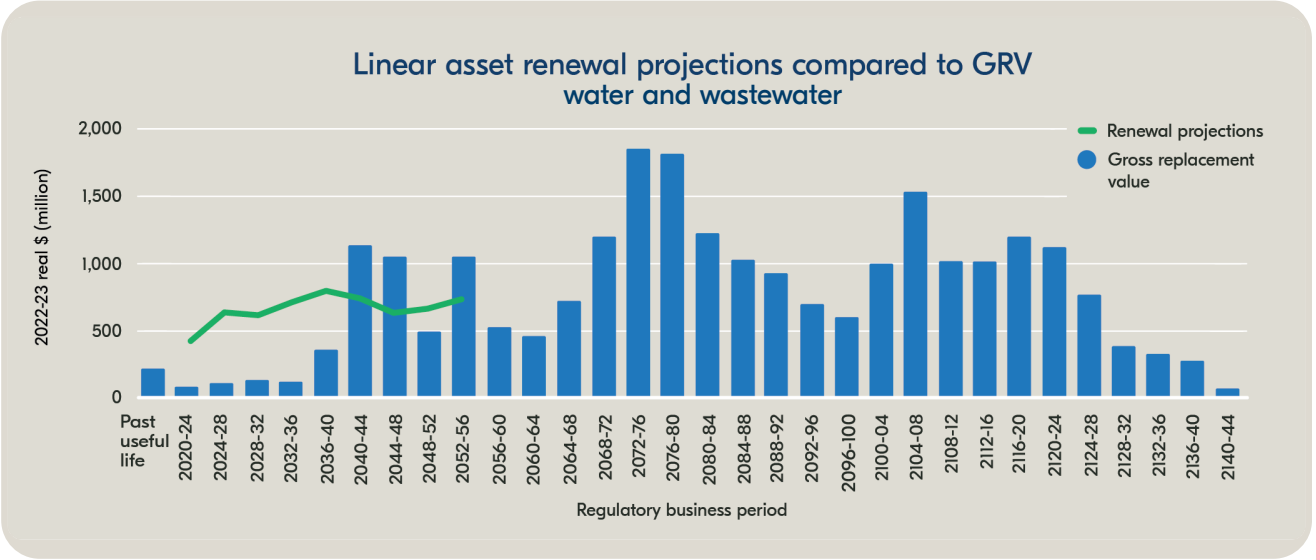


Figure 8: Linear asset renewal program against gross replacement value (GRV) water and wastewater

Improvements made in linear asset renewal projections

In this iteration of the projection, linear asset renewal investment is driven by a program of planned work. This moves away from directly using the gross replacement values of linear assets, which is heavily influenced by age, material, size and installation context. The planned program of works is further influenced by asset conditions and to achieve better efficiencies, resulting in a flatter and more sustainable renewals investment profile.

Asset renewals

Linear water asset renewals

Investment in water linear asset renewal, combines the renewal of both regional and metropolitan reticulation networks and the renewal of six major transfer pipelines as they reach the end of their useful life over the next 100 years (as shown in figure 9).

Peaks in investment generally follow a similar trend, demonstrated by the line in Figure 9. To ensure continuity of service, investment is typically brought forward for higher risk assets, such as the phased renewal of major pipeline. Renewal of water linear assets can be delayed through new management techniques such as pressure management and water conditioning in reticulation networks.

Three major pipelines are expected to undergo renewal over the coming 30 years, most notably, the Eyre Peninsula pipeline renewal from regulatory periods 2028-32 to 2060-64, and the Morgan-Whyalla pipeline renewal which began in the current 2020-24 regulatory period is projected to be completed in the 2040-44 regulatory period.

Significant lengths of water assets are projected to reach the end of their useful life in approximately 50 years' time, or around 2072. This peak is being managed through early investment and operation management techniques, while condition and performance information continue to inform renewal prioritisation.

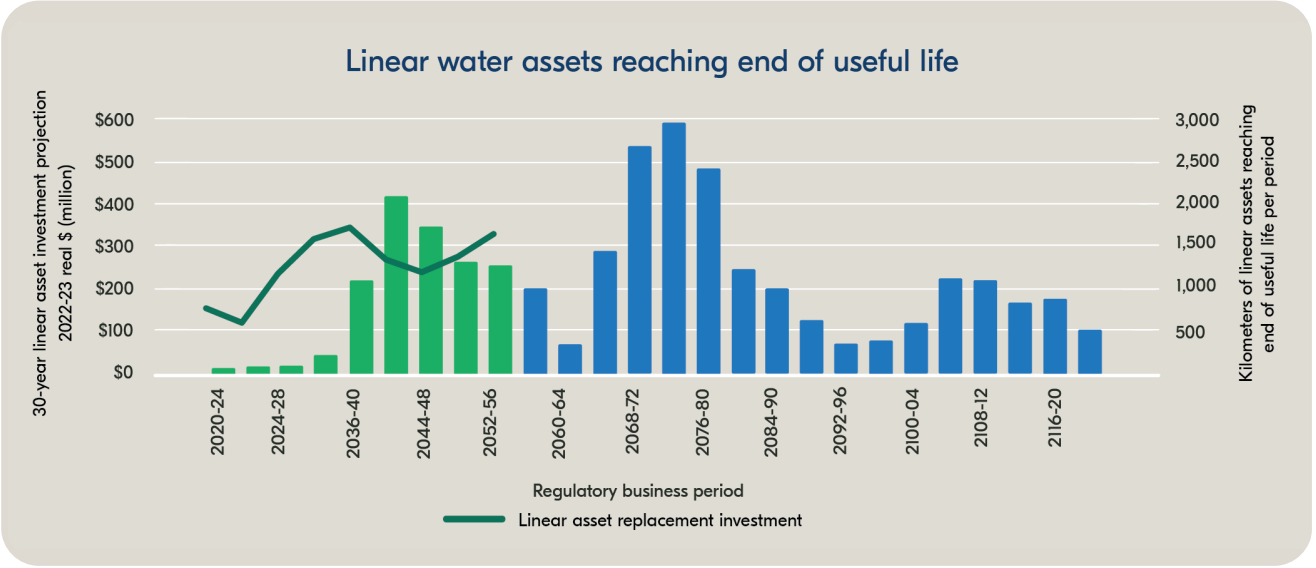


Figure 9: 100-year profile for linear water assets

To deliver a value for money service for our customers, we are investing in new technologies to transform our services and asset maintenance. Smart water networks collect information about the flow, pressure, water quality and leakage in water networks in real-time to optimise asset life and deliver improved service reliability. In adopting this technology, we can detect small leaks before they become breaks, enabling for planned repairs and reducing temporary service interruptions for customers and traffic disruptions for commuters.

Additional initiatives include our Asset Creation Improvement Program (ACIP), in which we have increased certainty, confidence and adaptability in our infrastructure lifecycle from planning to delivery.

Asset renewals

Linear wastewater asset renewals

Investment for wastewater linear asset renewal combines the renewal of both regional and metropolitan reticulation and trunk main networks as they reach the end of their useful life over the next 100 years (as shown in figure 10).

Peaks in investment generally follow a similar trend, demonstrated by the line in figure 10. To ensure continuity of service, investment is typically brought forward for higher risk assets, such as the renewal of major trunk mains throughout metropolitan Adelaide.

Renewal of reticulation mains involves relining wastewater mains, which are susceptible to failure from corrosion, with more durable materials. Informed by thorough condition assessments, we plan to invest in the renewal of Bolivar trunk main and Adelaide trunk main in regulatory period 2024-28.

Investment in linear wastewater network renewal is projected to remain reasonably stable in the coming 30 years. However, the 100-year age projection highlights a significant increase in the length of pipe requiring renewal beginning in 50 years, or around 2072, peaking in approximately 80 years' time, in approximately 2102.

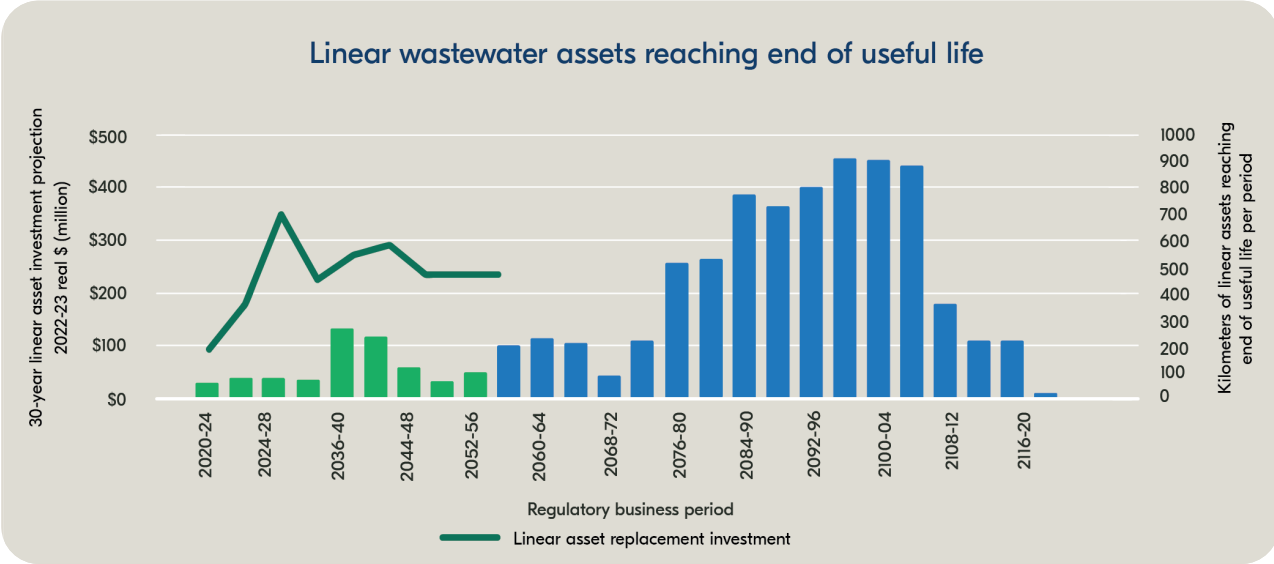


Figure 10: 100-year profile for linear wastewater assets

Asset renewals

Non-linear assets

Renewal of non-linear assets are predominantly informed by a condition rating. In the longer-term, age-based condition ratings indicate the expected deterioration of assets based on their expected useful life and provide indicative replacement peaks and troughs into the future. Condition assessments, representative of actual useful life of assets, supersede condition ratings.

For some assets, a visual condition assessment is sufficient to establish its condition, while for other more complex assets, a variety of more detailed assessments can be conducted, including:

- electronic diagnostics
- video inspections using remotely operated underwater vehicles
- drones or CCTV
- other non-destructive testing methods.

Investment is informed by performance information, such as data from smart monitoring to optimise asset performance, and diagnostics to improve operational efficiency and asset maintenance.

Long-term planning for asset renewals also considers changes in the asset base, such as a transfer in management of 10 water treatment plants and a wastewater treatment plant in the 2024-28 regulatory period and the Adelaide Desalination Plant in 2036-40, and increases in assets as the network accommodates growth and external responsibilities requirements.

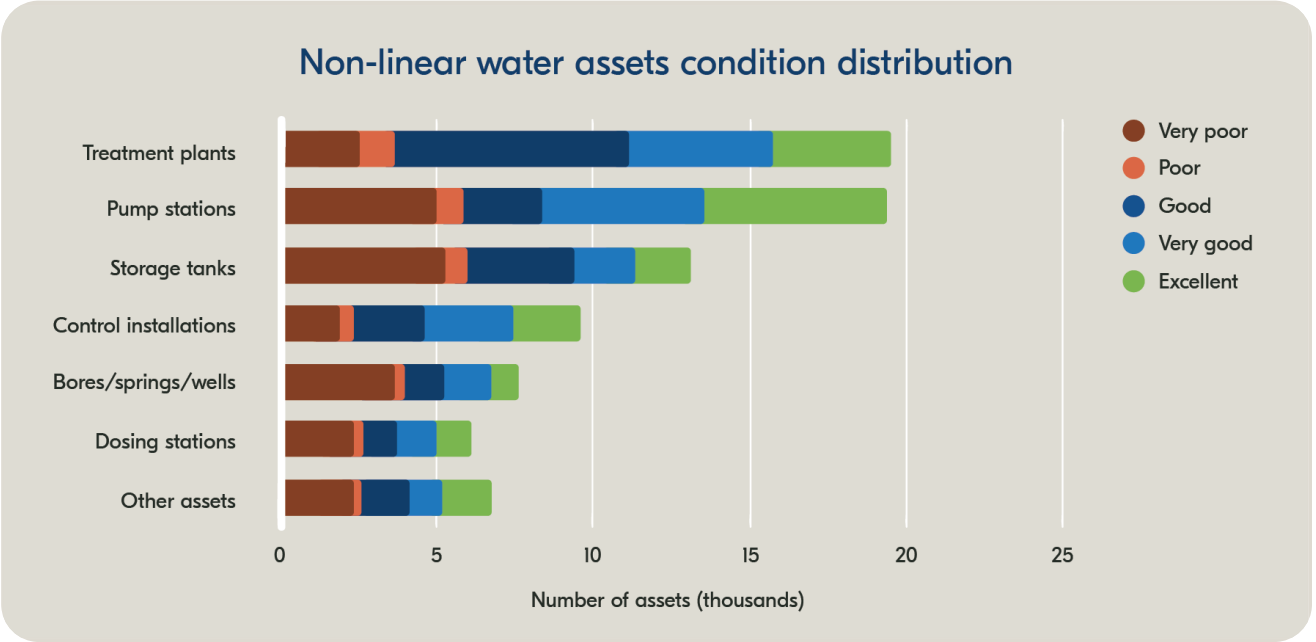


Figure 11: Condition of non-linear water assets

Water non-linear assets

Currently, visual condition inspections assessed 42 per cent of our assets, with the remaining relying on a theoretical age versus useful life interpolation.

Assets assessed as being in 'poor' or 'very poor' condition (as shown in figure 11), pose risks to delivery of our levels of service, and are targeted for replacement and renewal.

Asset renewals

Key investments

Asset renewals at dam and weir facilities is expected to average $11.06 million per regulatory period, with an expected spike of an additional $14 million in the 2036-40 regulatory period to address major overhauls and replacements.

A key focus of renewal of assets is to improve the level of automation, remove manual controls and reinstate electronic ones, helping reduce safety risks for our people working in and around these assets.
A further $6 million per regulatory period is planned for maintaining land surrounding reservoirs and improving water quality.

Introducing tank automation, adding chlorine disinfection, and separating tank inlets and outlets, at a projected cost of $7 million per regulatory period contributes to ensuring levels of service are met.
Ten non-drinking water systems are also currently scheduled to be upgraded in the 2028-32 regulatory period at an expected additional cost of $41 million.

Other investment in existing treatment plants is projected at an average of $192 million per regulatory period and may include:

- membrane replacements at the Adelaide Desalination Plant for $62 million every two regulatory periods and structural (such as tanks and chambers) upgrades in regulatory period 2036-40 of $128 million
- $46 million investment in earth bank storages at Mount Pleasant, Happy Valley and Morgan water treatment plants up to regulatory period 2052-56.

An investment of approximately $280 million per regulatory period for asset renewals at facilities along the water network is expected, with two spikes identified:

1. a $416 million backlog (due to investment deferrals and de-prioritisation in current and previous business periods) of renewals in regulatory period 2028-32
2. a potential $300 million investment in regulatory period 2044-48, primarily constituting multiple smaller investments targeted at major renewal of pump stations and control installations.

Replacement of customer meters averaging $26 million per regulatory period.

Investments to improve water quality in treatment plants is projected at $200 million per regulatory period to 2028-32, reducing to a projected $171 million per regulatory period to 2040-44 and down to $36 million per regulatory period from 2044-48 onwards, and may include:

- a metropolitan Adelaide-focused water quality improvement program in the Happy Valley and Barossa regions costing $102 million and $59 million respectively in regulatory period 2024-28. An ongoing investment of $80 million per regulatory period to improve aesthetics and protect against health risks
- potential upgrades of $125 million to improve Bordertown water supply and security from regulatory period 2028-32 to 2032-36
- a desalination plant at Melrose for $85 million in regulatory period 2028-32.

Asset renewals

Wastewater non-linear assets

Condition inspections have been undertaken on 66 per cent of our wastewater and recycled water assets across the state. The remaining water assets rely on theoretical condition ratings based on age and expected useful life.

Assets assessed in 'poor' or 'very poor' condition (as shown in figure 12), pose risks to delivery of the levels of service, and are specifically targeted for prioritised replacement and renewal.

Key investments

Multiple smaller renewals, such as relining concrete in wet wells and refurbishing valve chambers and other concrete structures, contributes to a planned investment of $9 million in the 2024-28 regulatory period, followed by an average of $16 million per regulatory period ongoing.

An average of $125 million per regulatory period is invested in the structural renewal of treatment facilities. Upcoming renewal, significantly at the Bolivar Wastewater Treatment Plant, is projected to be more than $29 million in 2024-28, with a further $160 million projected in 2028-32.

Investment of $43 million per regulatory period maintains mechanical and electrical assets, with expected spikes to be managed in the 2028-32 and 2044-48 regulatory periods. Ongoing investment in similar asset renewals at treatment plants is projected at an average of $88 million per regulatory period in future regulatory periods.

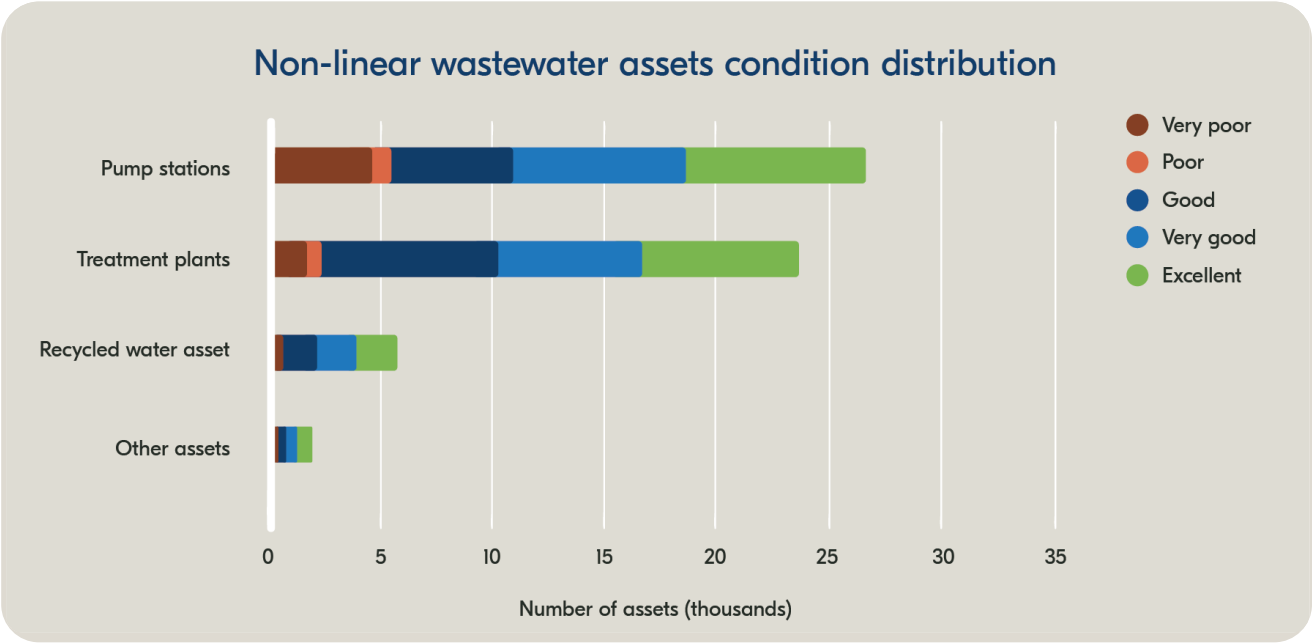


Figure 12: Condition of non-linear wastewater assets

Asset renewals

Common assets

Maintenance of control and communications, major and minor plant, and energy system assets common to both water and wastewater systems, such as supervisory control and data acquisition (SCADA) devices and remote terminal units, ensure assets stay up-to-date and remain relevant and supported by manufacturers. Electronic assets typically have a useful life of approximately three to four regulatory periods, or 12 to 16 years.

Renewal costs for telemetry equipment enabling remote monitoring and control of water and wastewater assets in compliance with our SCADA security protocol, such as implementing programmable logic controllers, is projected at approximately $23.6 million per regulatory period.

Ongoing investment in minor and major plant assets of approximately $25 million per regulatory period helps to ensure delivery on our levels of service. Major plant assets include backhoes, excavators, tipper trucks and trailers. Minor plant assets include laboratory equipment, mobile pumping units, mobile generators, forklifts, and boats. A fleet management arrangement provides a replacement schedule based on use and operating environment which informs investment projection.

Growth

While the 30 Year Asset Investment Plan addresses uniform growth across the state, we have experienced significant accelerated growth in RD20. The growth projections in RD24 are continuing to accelerate and changes are being actively assessed. This 30 Year Plan reflects the growth projections included and known at the time of developing the regulatory determination 2024-28 submission. This is likely to require a considerable increase in funding, particularly to address growth at the outskirts of our existing networks, including key areas such as metro North.

Tools and capabilities

Our water and wastewater networks are represented digitally by hydraulic models costing $4 million per regulatory period for water models and $7 million per regulatory period for wastewater and recycled water models.

These data-fed models capture network demand and capacity, and can simulate multiple scenarios to enable planning for future investment. The models also undergo upgrades in capability, enabling modelling of more complex issues, such as pre-emptively identifying odour hotspots in wastewater systems.

Network and facilities

A capital investment plan, informed by hydraulic models, population and industrial growth projections and many other parameters, models the necessary augmentation, expansion and upgrade of our network and facilities to support growing demand for our services.

Water network facilities growth

To meet projected population growth and corresponding demand projected, we need to invest in further water sources for the Yorke Peninsula and upper Spencer Gulf region in the 2028-32 regulatory period. Multiple solutions are being investigated and indicative allowances of $150 million and $250 million respectively is currently being planned to deliver these outcomes.

Other areas of growth attracting key investment over the next 15 years, will include:

- Freeling
- Mount Pleasant
- Mannum
- Murray Bridge.

A further minimum investment of $292 million per regulatory period is projected to maintain network and facilities in line with projected growth and demand.

Wastewater network facilities growth

On average, investment of $350 million per regulatory period has been projected to enable expansion of the networks and facilities in our wastewater systems in line with population growth.

On average, $97 million of investment each period is projected to upgrade the network at Bolivar, with an additional $197 million projected from 2032-36 to 2036-40 to upgrade and optimise the activated sludge reactor at the Bolivar Wastewater Treatment Plant.

On average, a $33 million investment is projected to upgrade the network at Glenelg each period, with an additional $203 million upgrade to the Glenelg Wastewater Treatment Plant projected in regulatory period 2036-44.

External responsibilities

Various legislations, Acts, guidelines, and external programs contribute to our set objectives including, but not limited to:

- providing safe clean drinking water as per the *Safe Drinking Water Act 2011*
- protecting the environment as outlined in the *Environment Protection Act 1993* and *Heritage Places Act 1993*
- ensuring a safe environment for our people and the community as required by the *Work Health and Safety Act 2012*
- maintaining public safety by managing our dams in accordance with the Australian and New Zealand Committee for Large Dams guidelines.

Across the three drivers, asset investment in external responsibilities is considered the most reactive. Investment is impacted by a constantly changing landscape of responsibilities and is also triggered when assets fail, or risk of failure is assessed as significant.

Safety

Dam safety

Our dam safety program focuses on capital investments to upgrade, repair and replace parts of a dam to protect public health and safety by avoiding potential dam failures.

Throughout the 2024-28 regulatory period, investment at Mount Bold and Warren Reservoirs is projected in response to risks identified that exceed a risk profile that is considered acceptable.

An ongoing investment of $36 million per regulatory period reduces and controls risks.

Work health and safety improvements

Our health and safety improvement program covers both compliance issues and safety issues for high-risk infrastructure to ensure our people and communities are safe.

Mitigation of ongoing risks, such as electrical, fire, asbestos, plus fall prevention and safe access across water assets require investment of $93.5 million per regulatory period. A further $21 million of investment aims to address the workplace exposure standards for new hydrogen sulphide exposure limits.

The emergence of identified hazards is projected to require $57 million in investment per regulatory period.

Inclusive accommodation

The accommodation program invests where our people work, such as depots, workshops, administrative facilities within treatment plants, laboratories and offices. An investment of approximately $10 million per regulatory period is planned to support fit-for-purpose, inclusive and streamlined workplaces that ensure the safety of our people, protection of our environment and help our people meet operational targets.

An Investment of $22.5 million in regulatory period 2024-28 and $22.55 million in 2028-36 is planned to support fit-for-purpose, inclusive and streamlined workplaces that ensure the safety of our people, protection of our environment and help our people meet operational targets. Additionally, this will address gaps in accommodation assets, such as ensuring inclusive access to sites and the inclusion of female toilets, as well as upgrades to four depots to help teams better service our customers.

External responsibilities

Environment

Improve Environmental Performance Program

The Improve Environmental Performance Program aims to meet goals set by other agencies, including the Environment Protection Authority and Department for Health and Wellbeing, such as wastewater and recycled water quality and reliability targets and emissions reductions.

Investment in this program ranges from $110 million to $310 million per regulatory period, with constant investment across most facilities and targeted investments to address emerging risks, including:

- $63 million in regulatory period 2028-32 at Bolivar to improve sludge thickening
- $110 million across regulatory period 2028-32 and regulatory period 2032-36 to improve recycled water quality at Glenelg
- $40 million in regulatory period 2032-36 for the UV system upgrade at Victor Harbor
- $15 million in regulatory period 2032-36 for inlet works at Port Lincoln
- $10 million in regulatory period 2036-40 for inlet works at Whyalla
- $30 million in regulatory period 2040-44 to improve total nitrogen (TN) performance at Bolivar
- $10 million in regulatory period 2044-48 to improve sludge handling at Yankalilla and
- $30 million in regulatory period 2048-52 for merging the two Port Augusta wastewater treatment plants.

Odour management

The odour management program targets and rectifies odour hotspots across the wastewater network, deploying filtration and chemical dosing systems at locations that attract high numbers of complaints. Complaint volumes are the primary driver for investment, averaging $25 million per regulatory period, with an additional $13 million to target known odour hotspots at Aldinga Beach, Modbury Heights and Sheidow Park in regulatory period 2028-32.

Overflow abatement

Assets such as wastewater pump stations are expected to function, under the harshest conditions, including high inflow events or power interruptions. These assets need to be able to hold and transfer wastewater while minimising overflow wherever practicable.

Investment is primarily reactive and driven by the assessment of risks including the severity of consequences, such as proximity to environmentally sensitive sites, and the likelihood of an overflow, particularly when there has been a history of type-3 (near-miss) overflow events.

An expected $6 million investment in regulatory period 2024-28 aims to improve overflow abatement, including one project to improve overflow structures and fifteen projects to install permanent generators for improved resilience during power interruptions. From 2028-32, a $9 million investment per regulatory period is projected to effectively manage emerging risks.

Appendix A - Major changes in this update

Summary

This iteration of the 30-year asset investment projection represents the long-term asset investment projection, aligned with what is proposed within the Regulatory Determination 2024 submission.

This is in contrast to the 30 year plan provided last year which represented an unconstrained, unprioritized technical investment plan (TIP) which represented the full complement of investments wherein the need was established, to be able to manage risks to levels of services provided by our assets. The revised projection figures provided in this update represents a prioritised Technical Investment Plan, updated to critically assure a balance between our obligations to maintain a level of service to our customers and maintain affordable, value for cost services to all South Australians.

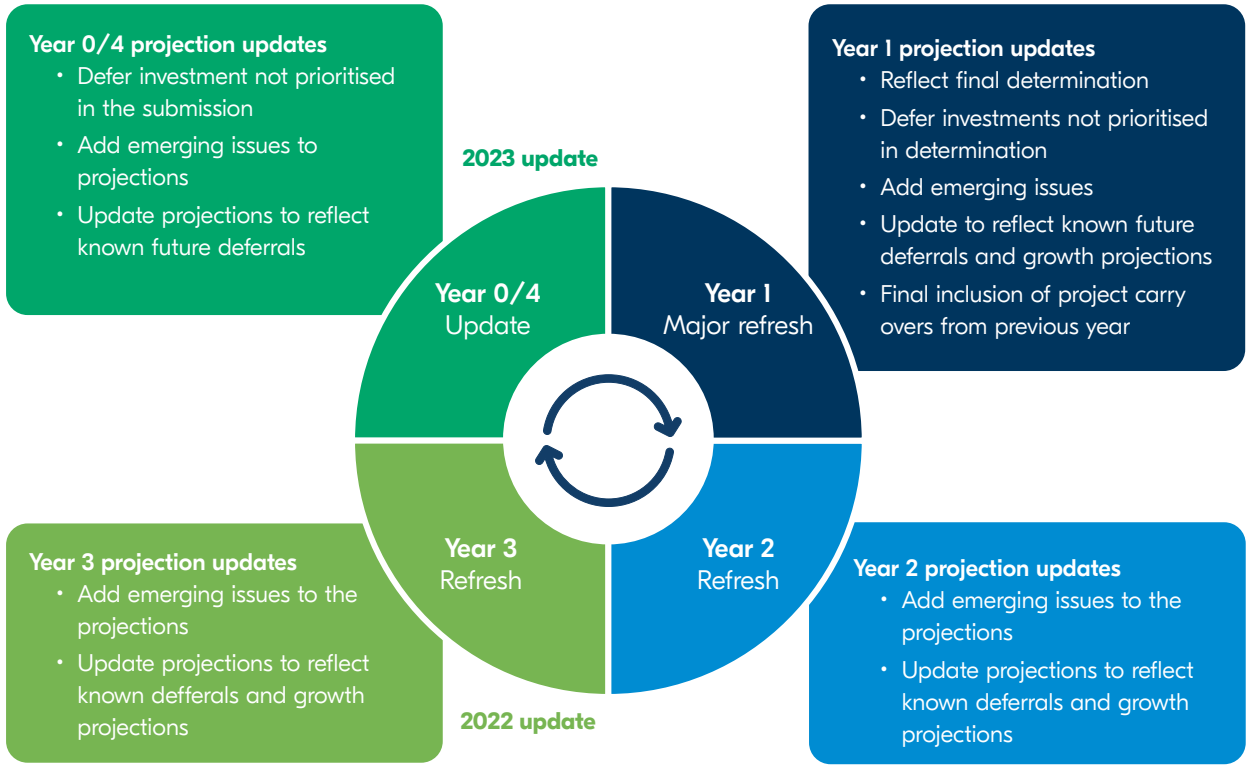
This year's submission utilises the prioritised Technical Investment Plan projections. It balances the immediate risks to infrastructure and maintaining current service standards, with the costs paid by customers. In our regulatory Determination 2024 submission, we have prioritised affordability for customers without substantially addressing long-term capital pressures required to ensure intergenerational equity of access to the same, or better, levels of service for the future.

The lower allowed investment in the current regulatory period is creating increased pressure for future investment, this is exacerbated by investment deferrals in the current period in order to prioritise competing expenditure.

The 2024 update represented by "Year 1 Major Refresh" will reflect the final determination for RD24.

Process update

This 30 Year Asset Investment Plan 2023 update represents the "Year 0/4 update" of the 4 Year cycle for the RBP period as shown in figure 13 below.



*Assumes current annual review remains

Figure 13: 30 Year Plan Update Cycle

Appendix A - Major changes in this update

Analysis

In a dynamic operating environment with population growth, security of supply, economic headwinds and a near term swell in aging asset renewals, SA Water is committed to meeting the global challenge of providing capital efficient infrastructure investments. This commitment will ensure our prudent stewardship for future generations in delivering trusted water services for a sustainable and healthy South Australia for future generations to come.

Table 3 below provides a summary of the change in investment projections for both water and wastewater from the previous version of this plan.

As state growth projections are evolving, associated planning and funding mechanisms are underway. However growth in this document reflects the regulatory determination 2024-28 submission only.

Table 3: Change in asset investment projections from previous iteration of this plan

Driver	Water investment projection Long-term average ($ million/ regulatory period)		Wastewater investment projection Long-term average ($ million/ regulatory period)	
	2021-22 Update	2022-23 Update	2021-22 Update	2022-23 Update
Asset renewals	1,171	1,195	464	496
Growth	431	415	364	366
External responsibilities	220	436	275	294
Total	**1,822**	**2,046**	**1,103**	**1,156**

Appendix A - Major changes in this update

Over the past 12 months, individual asset investment programs have developed long-term projections to address the respective risks to their targeted levels of service. The result is this document, representing a current snapshot in time of what we intend to invest as we move towards the future. It is, however, understood and accepted that there is a multitude of factors, both internal and external, that may impact and alter these projections as they draw nearer to present time.

Internal factors may include prioritisation and re-prioritisation of what we need to invest in to get the best outcomes, or investment capping to maintain rates at a certain value. External factors include escalating costs of delivery with a global price increase on materials and fuel, freight and electronic shortages, inflation rates and increasing labour costs. Increasing asset breakdown events due to incremental risk elevations as a result of deferrals and accelerated customer growth.

The impact of these factors will present in various forms (as shown in figure 14). Some of the investments initially planned for the upcoming regulatory business period (RD24) have been deferred to later business periods to balance the need for investment and maintain our customer levels of service with our obligation to maintain customer value for money and affordability outcomes.

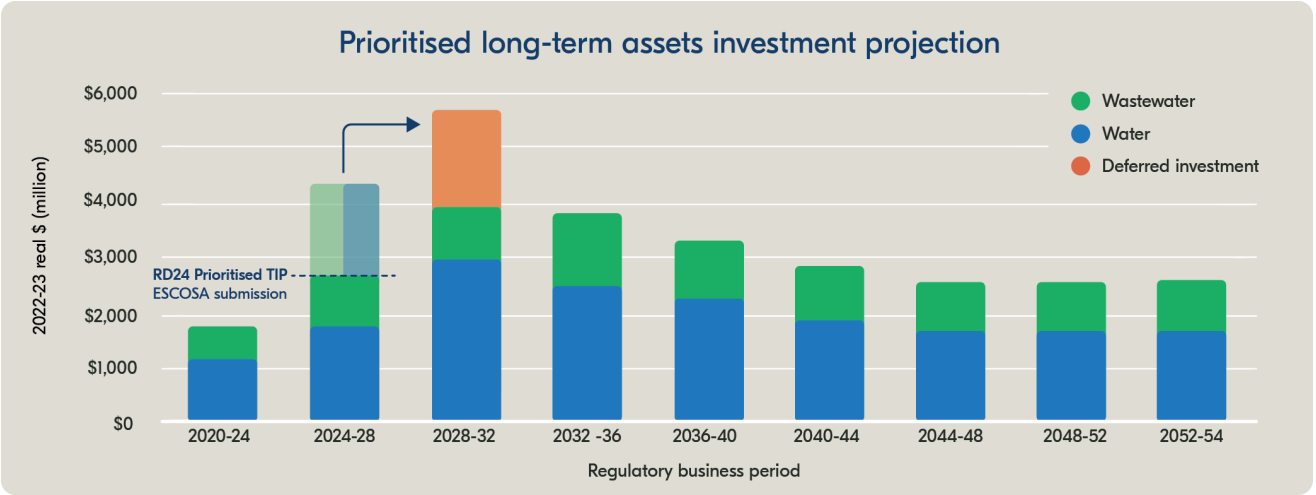


Figure 14: Prioritised long-term assets investment projection

Appendix A - Major changes in this update

Deferred risk

The RD24 prioritised submission has changed the projection profile for the 2023 update with reprioritised projects now being deferred into RD28 and later years. This results in a peak investment projection and increased projected investments in future years.

A key emergent insight from our 30 year planning activities is the accumulation of asset risk that accompanies prioritisation-driven investment deferrals. The impact of these deferrals is most acutely realised through an accrual in future cost of delivery, as well as an interim cost of operating our assets with an incrementally accumulating profile of deferred risk. If lower allowed investment is left unaddressed, higher investments will be required in future regulatory periods whilst also increasing operating expenditure to manage ageing assets. Our modelling of risk over the RD periods demonstrates that continued steady constrained investment will be insufficient to deal with only the “very high” risks within five regulatory periods. We seek to address this in future regulatory determination submissions, as we remain committed to achieving a balance in customer value and proactive investment in our infrastructure for the future.

Key improvements

Since the last update to our 30-year Asset Investment Plan, the maturity in our long-term planning projections has increased through our continual improvement processes, both in system workflows and an ongoing information technology transformation which will continue to deliver incremental improvements over the next several years. This is further enhanced by an intensive planning process for the 2024-28 regulatory period which has been undertaken within the period leading to this submission.