



CITY OF
Port Adelaide Enfield

PUMP STATIONS 20

ASSET MANAGEMENT PLAN 20



PUMP STATIONS

ASSET MANAGEMENT PLAN

20
20

Document Control					
Port Adelaide Enfield Council: Pump Station Asset Management Plan					
Rev No	Date	Revision Details	Author	Reviewer	Approver
1	Aug-2008	Adopted: Dec 2008	RK	GB	WI
2	May-2013	Adopted: June 2013	JN	GB	WI
3	Sept-2016	Adopted: November 2016	JN	GB / SD	WI
4	Sept-2020	Adopted: November 2020	TC	Stormwater Custodian Group	AM Steering Group
4.1	June-2021	Addendum: June 2021	JN	MB	AM Steering Group

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EXECUTIVE SUMMARY

This edition of the Pump Station Asset Management Plan (AMP) continues to advance the level of service delivered to the community. It will detail what infrastructure we have, why it needs to be maintained, and what is the most efficient way to manage this asset class to deliver a service that will protect our existing and future community.

This AMP reviews the infrastructure assets that form the Pump Station inventory, which have a combined Replacement value of \$26.3 Million with a total Annual Depreciation expense of \$610 Thousand.

It must be noted that this AMP covers only the infrastructure associated with our major pump stations, and does not include irrigation pumps or recirculation pumps for water quality. Furthermore, this plan covers only the infrastructure within each pump station, with all underground pipework leading to the stations covered under the Stormwater AMP.

There are 12 Pump Stations identified within this Plan, which are managed through a combination of maintenance of existing infrastructure, renewal of older assets, along with upgrade projects and construction of new infrastructure that is needed to safeguard our current and future communities from flooding.

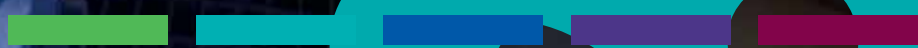
From an operational sense, this AMP demonstrates that Council staff have a high level of confidence in understanding what and when components within each Pump Station need to be replaced and at what cost. This level of knowledge has been gained through the active capture of condition data and a significant focus on infrastructure improvement projects within recent years. Understanding the needs of each Pump station has resulted in a high level of maturity in projecting future capital and maintenance expenditure across the 10 year planning period.

As highlighted in Section 5.4.3, there are 3 major projects that have not been accounted for within this Plan that will add significant cost to Council's Long Term Financial Plan (LTFP). As the complete suite of AMP's are responsible for informing the LTFP of future infrastructure costs, this Plan has identified the potential need of approximately \$25 Million of new Pump Station infrastructure that has resulted from recent Stormwater Management Plan (SMP) studies. However as these projects have not yet been work shopped with Elected Members or formalised through a Council report, the future costs of these projects have not been included within this AMP's 10 year capital and maintenance projections.

Fundamentally, Asset Management is the projection of forthcoming works and ensuring the organisation has the required funding and resource capability to meet the projected demand. The expenditure projections within this AMP are consistent with the current Long Term Financial Plan (LTFP). This reflects cohesion between the SMP's, AMP, and LTFP when committing to the long term financial period.



2 INTRODUCTION



2.1 Background

This asset management plan is designed to comply with ISO 55000 for Asset Management, and communicates the actions required for the responsive management of assets (and services provided from assets), compliance with regulatory requirements, and funding needed to provide the required levels of service over a 20-year planning period.

It follows the format for AM Plans recommended in Section 4 of the International Infrastructure Management Manual¹.

The plan is to be read with the Asset Management Policy and Asset Management Strategy where these have been developed along with the following associated planning documents:

- Lefevre Peninsula Stormwater Management Plan
- Port River East Stormwater Management Plan
- Stormwater Drainage Asset Management Plan

The infrastructure assets covered by this asset management plan are shown in Table 2.1. These assets are used to provide drainage services to the community where this cannot be achieved by

Table 2.1: Assets covered by this Plan

Asset category	Pumping Capacity	Replacement Value
Hack St Pump Station	8x 350L/s	\$3.6million
Hart St Pump Station	3x 800L/s, 2x500L/s, 2x210L/s	\$4.9million
Wellington St Pump Station	1x200L/s, 2x1000L/s	\$2.8million
Perkins Dr Pump Station	2x350L/s	\$413k
Mersey Rd Pump Station	5x350L/s	\$1.8million
Carlisle St Pump Station	4x350L/s	\$1.7million
Lulu Pump Station	6x350L/s	\$1.4million
Hamilton St Pump Station	2x20L/s	\$75k
Midlunga Pump Station	1x100L/s	\$115k
Hargrave St Pump Station	2x 200L/s, 3x800Ls	\$8.3 million
Archie Badenoch Pump Station	2x200L/s	\$200k
Newhaven Village Wastewater Pump Station and Treatment plant	2x25L/s pumps plus wastewater treatment plant.	\$700k
TOTAL		\$27 million

¹ IPWEA, 2015, Sec 4.2, Example of an Asset Management Plan Structure, pp 4|37 – 39.

Asset	
<p>Switchboard</p> 	<p>Platform</p> 
<p>Generators</p> 	<p>Trash Rack</p> 
<p>Pumps</p> 	<p>Pit</p> 
<p>Gantry Crane</p> 	<p>Sensors</p> 

Table 2.1: Assets covered by this Plan

Key Stakeholder	Role in Asset Management Plan
Councillors/Board Members	<ul style="list-style-type: none"> Represent needs of community/shareholders, Allocate resources to meet the organisation's objectives in providing services while managing risks, Ensure organisation is financial sustainable.
CEO/General Manager	<ul style="list-style-type: none"> Represent needs of community/shareholders, Allocate resources to meet the organisation's objectives in providing services while managing risks, Ensures the organisation is financial sustainable
Director City Assets	<ul style="list-style-type: none"> Ensures the Asset Management Plans are completed and reports to City Manager and Council.
Manager Infrastructure, Assets, and Maintenance	<ul style="list-style-type: none"> Manages the review of Asset Management and the delivery of improvement strategies.
Field Team Leaders	<ul style="list-style-type: none"> Undertakes maintenance of drainage network – along with road surface and kerb works Report upon maintenance issues
Operational Support Team - Workshop	<ul style="list-style-type: none"> Responsible for maintenance of all Pump Stations
Community	<ul style="list-style-type: none"> Community in low lying areas is adversely affected in the event of pump station failure

2.2 Core and Advanced Asset Management

This asset management plan is prepared as a 'advanced' asset management using a 'bottom up' approach for gathering detailed asset information for individual assets to support the provision of activities and programs to meet agreed service levels in a financially sustainable manner.



3

LEVELS OF SERVICE



3.1 Customer Research and Expectations

A survey was undertaken in both 2016 and 2019 to measure the community perception of the assets that provide services to the community. The overall objectives of the survey was to capture the community's consideration of Council's infrastructure assets. It was conducted across 400 households (statistically relevant survey sample) that were invited to partake. The data collection method used was online surveys, CATI (computer assisted telephone interviews) and face to face interviews. The aim of the survey was to measure:

- Community perceptions of the importance of these services
- Current levels of satisfaction with these services, and
- Future priorities in terms of information on what Council potentially over or under service

The survey targeted an equal number of households equivalent to previous 2016 survey in each of the five Statistical Local Areas (Coast, Port, Inner, Park and East) in the Council area. These areas are detailed below:

Figure 3.1.1 Basic Customer survey for the City of Port Adelaide Enfield

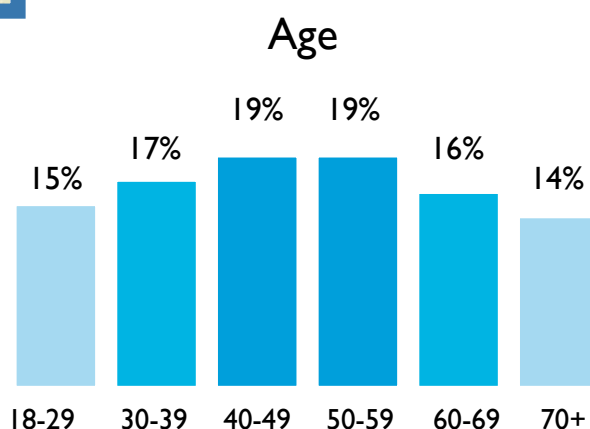
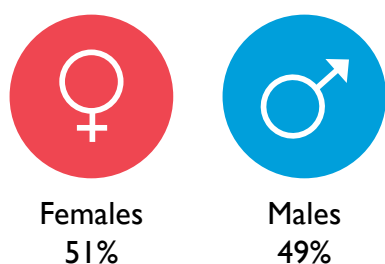
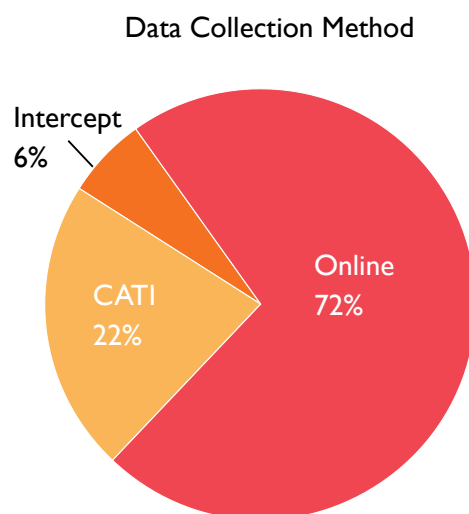
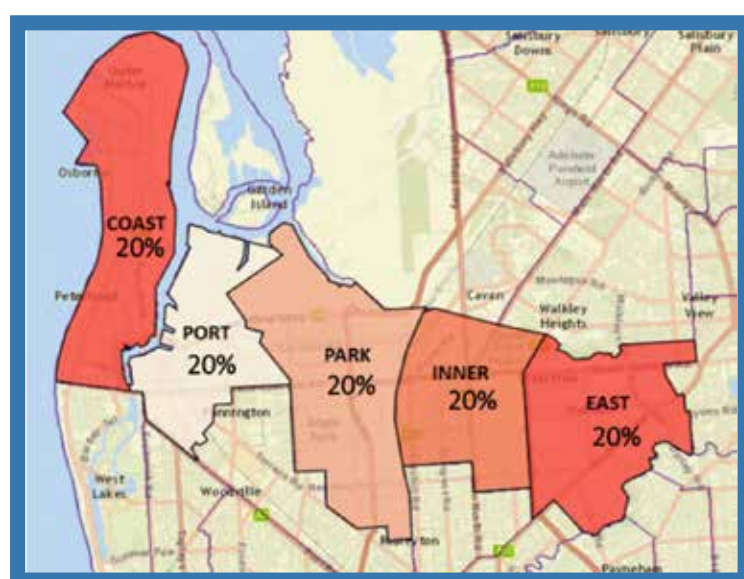


Figure 3.1.2 – Satisfaction in stormwater drainage has increased in the coast and port regions where pump stations are part of the network.

Where possible Services have been compared to a 2016 report provided by Council.

	OVERALL	COAST	PORT	PARK	INNER	EAST
OVERALL SATISFACTION WITH STORMWATER MANAGEMENT						
2019	3.8	3.7	3.9	3.9	3.9	3.8
Stormwater pollutant traps						
2019	3.7	3.7	3.7	3.6	3.6	3.8
2016	3.6	3.3	3.5	3.9	3.5	3.8
Stormwater drainage						
2019	3.6	3.7	3.6	3.6	3.6	3.6
2016	3.6	3.1	3.4	4.0	3.7	3.6
Street Sweeping						
2019	3.6	3.8	3.7	3.5	3.6	3.4
2016	3.7	3.6	3.6	3.9	3.7	3.9

2019 figures in blue are higher than 2016 2019 figures in red are lower than 2016 2019 figures in black are unchanged from 2016

The following shows a series of services provided and details the satisfaction with Stormwater based on Statistical Local Areas across the Council area

Figure 3.1.3 showing stormwater pump stations is considered by the public to be the least important stormwater priority, except in the low lying coast area which relies upon them.

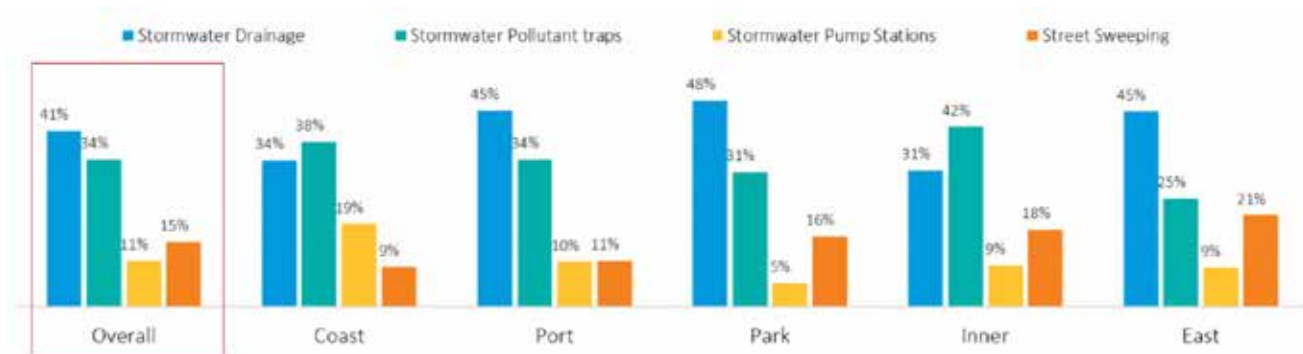


Figure 3.1.4 Stormwater pump stations are considered important by the public

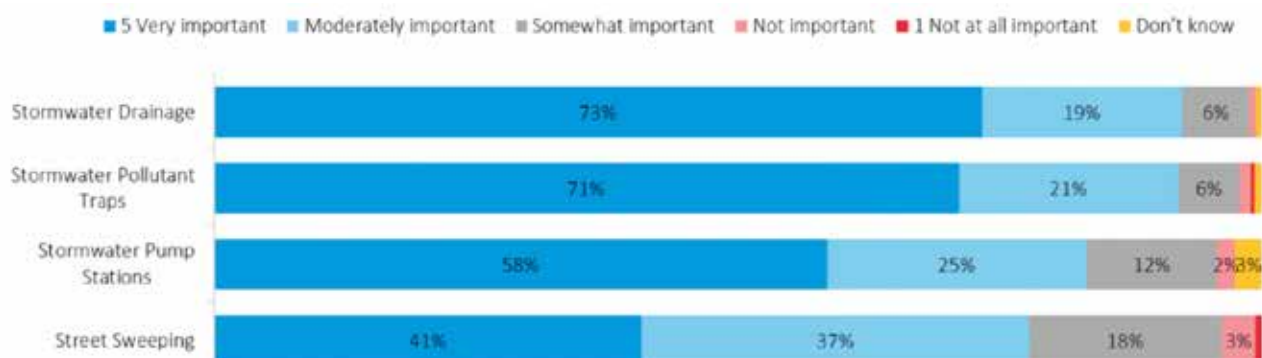
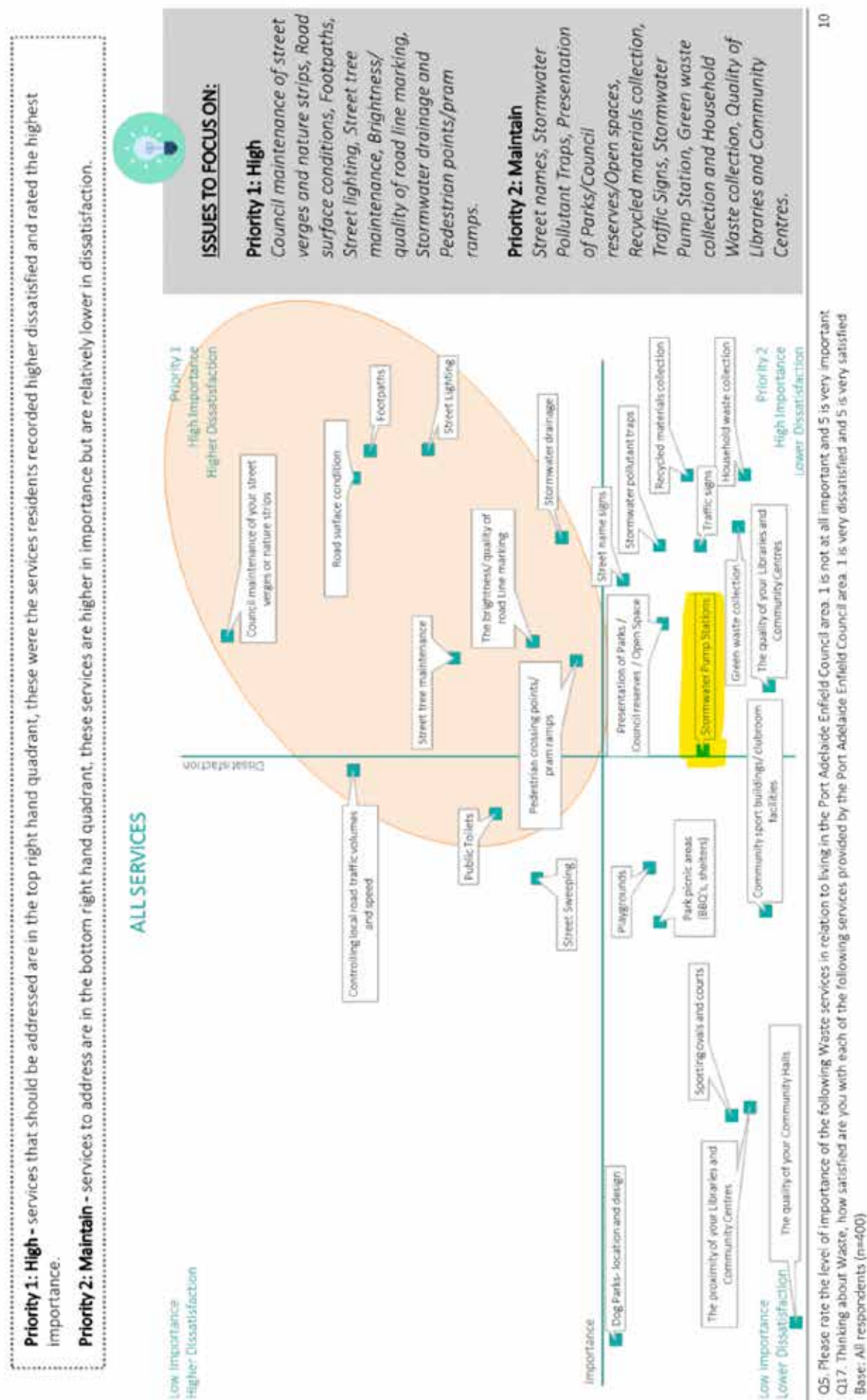


Figure 3.1d – The public is largely indifferent to stormwater pump stations, but concerned with drainage overall, likely because they only effect part of council, most are unaware these pump stations exist, and cannot assess their performance.



The most common specific comments from the public regarding stormwater pump stations:

1. Am unaware of their existence, or know nothing of their operation (8 responses)
2. I still see flooding, so they must not be working (2 responses)

In conclusion only in the coastal region do people have any awareness of stormwater pump stations and pump stations performance cannot be easily observed or assessed by the general public

3.2 Strategic and Corporate Goals

The City of Port Adelaide Enfield is guided by the City Plan 2030. The vision of the City Plan is for:

A city that values its diverse community and embraces change through innovation, resilience and community leadership'

ECONOMY

We are a thriving economy and a business-friendly City

- That the infrastructure provided under this Asset Management Plan is successfully connecting business and industry to opportunity and prosperity.
- Sourcing goods and services locally is considered when undertaking procurement.

Prosperous • Connected • Growing

COMMUNITY

We are a safe, vibrant, inclusive and welcoming city for our residents, businesses and visitors alike

- To ensure that the infrastructure provided under this Asset Management Plans achieving a Level of Service that is expected by the community and its Elected Members.

Healthy • Inclusive • Cohesive

ENVIRONMENT and HERITAGE

We are a low carbon, water sensitive and climate resilient City and our built heritage is protected, embraced and celebrated

- Sustainability, water and energy efficiency are considered when upgrading assets

Distinctive • Adaptable • Sustainable

PLACEMAKING

We are a unique and distinctive collection of active places, created and cared for through strong partnerships

- To ensure that the infrastructure provided under this Asset Management Plan is delivering a safe environment for the community – ensuring access and linkage for people to conduct their life and business activities

Belonging • Accessible • Creative

LEADERSHIP

We are an innovative, collaborative and high performing leader within local government

- To measure the organisation's performance through key financial indicators and accuracy of data and to advance Council's Asset Management Plan with a strategic improvement plan.
- To outline current levels of expenditure, and to identify projected funding requirements for future projects that will deliver sustainable infrastructure for the community.
- To connect this Asset Management Plan with the people, relevant organisations and businesses that make up the Port Adelaide Enfield community through Public Consultation and Community Survey.

Strategic • Accountable • Engaged

Table 3.2.1: Organisational Goals and how these are addressed in this Plan

Strategic Alignment

This Pump Stations Asset Management Plan primarily fits within the Leadership theme of the City Plan, contributing to decisions being made in a more strategic and accountable manner.

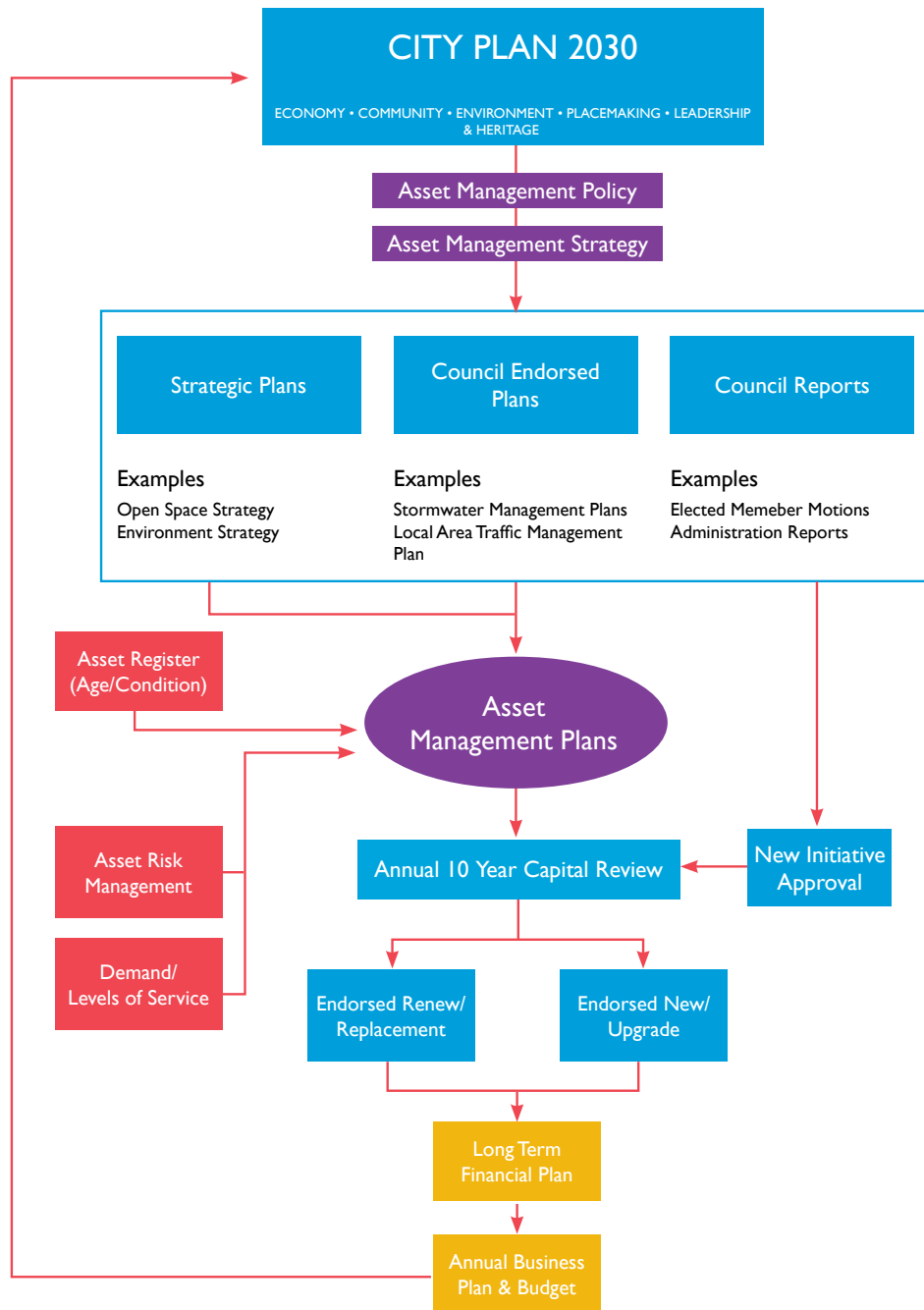
This Asset Management Plan also relates to a number of other Council documents including (but not limited to):

- City Plan
- Asset Management Policy
- Asset Management Strategy
- AdaptWest Region Climate Change Adaptation Plan
- Lefevre Peninsula Stormwater Management Plan
- Port River East Stormwater Management Plan
- Long Term Financial Plan
- Annual Business Plan and Budget

Implementation and adoption of the Pump Stations Asset Management Plan will support the City of Port Adelaide Enfield to achieve the directions of the City Plan 2030.

Figure 3.2 The City of Port Adelaide Enfield Storm Water Pump Station Network Map





The organisation will exercise its duty of care to ensure public safety is in accordance with the infrastructure risk management plan prepared in conjunction with this AM Plan. Management of infrastructure risks is covered in Section 5.

3.3 Legislative Requirements

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

Table 3.3: Legislative Requirements

Legislation	Requirement
SA Local Government Act 1999	Sets out role, purpose, responsibilities and powers of local governments including the preparation of a long term financial plan supported by asset management plans for sustainable service delivery.
SA Local Government Act - Stormwater Management Amendment Act 2016	Established the stormwater management authority, and subsequent requirements for the preparation of stormwater management plans, from which requirements to increase drainage capabilities are derived.
SA Work Health and Safety Act 2012	An act to provide for the health, safety and welfare of persons at work, and for other purposes
South Australian State Records Act 1997	To Ensure the City of Port Adelaide Enfield records and stores all relevant information as set out by the government of South Australia
Australian Accounting Standards	Sets out the financial reporting standards relating for the valuation and depreciation of Councils infrastructure assets.
SA Water Industry Act 2012	Ensure that South Australian consumers have safe, reliable and quality water supplies, sewerage and installations
Environment Protection Act 1993	Sets out the requirements to sustainably protect the environment during both the construction and life of the asset.
Relevant Australian Standards and codes of practice	Ensure that works are completed as per relevant Standards

3.4 Customer Levels of Service

Service levels are defined service levels in two terms, customer levels of service and technical levels of service. Customer Levels of Service measure how the community receives the service and whether the organisation is providing community value. They are determined via the public consultation process and customer satisfaction surveys.

Table 3.4: Customer Level of Service

Service Attribute	Service Objective	Performance Measure Process	Current Performance	Expected position in 10 years based on current LTFP
COMMUNITY OUTCOMES				
A community in which homes and businesses do not flood due to inadequate drainage.				
COMMUNITY LEVELS OF SERVICE				
Quality	Have Pump stations which visually give the public confidence	Stations to be kept well maintained and in good order visually	Stations appear well kept and are visually appealing.	No decrease in visual appearance of pumping stations.
Function, Capacity/ Utilisation	Pump stations to prevent flooding to homes in anything greater than a 1/20 ARI event	Flooding not occurring in anything less than a 1 in 20 ARI event	Flooding prevented in a 1 in 5 ARI Event	Reduction in failure of equipment due to ongoing renewals, and greater pumping capacity.



3.5 Technical Levels of Service

Supporting the customer service levels are operational or technical measures of performance. These technical measures relate to the allocation of resources to service activities 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. opening hours, cleansing, mowing grass, energy, inspections, 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. road patching, unsealed road grading, building and structure repairs),
- Renewal – the activities that return the service capability of an asset up to that which it had originally (e.g. road resurfacing and pavement reconstruction, pipeline replacement and building component replacement),
- Upgrade/New – the activities to provide a higher level of service (e.g. widening a road, sealing an unsealed road, replacing a pipeline with a larger size) or a new service that did not exist previously (e.g. a new library).
- Service and asset managers plan, implement and control technical service levels to influence the customer service levels².

Table 3.5 shows the technical levels of service expected to be provided under this AM Plan. The “Desired” position in the table documents the position being recommended in this AM Plan.

Table 3.5: Technical Levels of Service

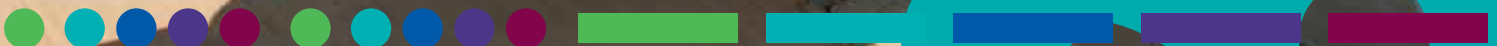
Service Attribute	Service Objective	Activity Measure Process	Current Performance *	Desired for Optimum Lifecycle Cost **	Agreed Sustainable Position ***
TECHNICAL LEVELS OF SERVICE					
Operations & Maintenance	Pump stations to have no more than one pump removed or underperforming at any time.	Pump stations are monitored remotely for faults and there is a weekly inspection routine.	Major Pump Stations Inspected Weekly (May-Aug), (Fortnightly Sept - March) Minor Pump Stations 4 weekly.	Major Pump Stations Inspected Weekly (May-Aug), (Fortnightly Sept - March) Minor Pump Stations 4 weekly.	Major Pump Stations Inspected Weekly (May-Aug), (Fortnightly Sept - March) Minor Pump Stations 4 weekly.
Renewal	Pump stations to have components in modern and functional condition in accordance with the AM Plan	New Pumps being purchased, electrical works to be brought to modern standards	Replacing 2 pumps P.A. switchboards replaced at Hack West and Mersey. Projects to replace at Lulu, Hack North and Carlisle are underway or planned.	Useful Life of Pump Station assets Pits 60yrs Gantries 60 yrs Fences 40yrs Pumps 20yrs Generators 40 Yrs Electrical 30 Yrs Trash Screens 5 Yrs	Useful Life of Pump Station assets Pits 60yrs Gantries 60 yrs Fences 40yrs Pumps 20yrs Generators 40 Yrs Electrical 30 Yrs Trash Screens 10 Yrs
Upgrade/New	Have all low lying areas capable of handling a 1/20 year rainfall event	Flood modelling to determine capacity required	New Pump stations constructed at Hargrave St, plans to install a larger pump station and detention basin at Hamilton St, Midlunga Birkenhead Naval Reserve and Jetty Rd Largs Bay	All Low lying dwellings are protected by pumping stations of an appropriate size to protect against a 1/20 year rainfall event	Upgrades and new Pump Stations Planned

It is important to monitor the service levels provided regularly as these will change. The current performance is influenced by work efficiencies and technology, and customer priorities will change over time. Review and establishment of the agreed position which achieves the best balance between service, risk and cost is essential.

²IPWEA, 2015, IIMM, p 2|28.



4 FUTURE DEMAND



Drivers affecting demand include things such as population change, regulations, changes in demographics, seasonal factors, environmental awareness, etc.

The impact of demand drivers that may affect future service delivery and use of assets are shown in Table 4.

Table 4.: Demand Drivers, Projections and Impact on Services

Demand drivers	Present position	Projection	Impact on services
Weather Patterns/ Climate Change	Climate change is happening	It is projected to be drier overall; however, storm events may be harsher.	Unpredictable. ARI data will change and this will affect the engineering of all stormwater assets.
Sea Level – Climate Change and Land subsidence.	Climate change is happening	After 100 years 500mm sea level change projected along with 210mm of land subsidence in the Lefevre Peninsula area. This would further decrease natural drainage of low lying areas.	Probable requirement for more and greater pumping facilities to supplement levy banks on the Port River.
Asset Integrity	Assets deteriorate over time	Pits built in the 1960s are to reach end of expected life from 2030 onwards.	Major Pump stations will need to be replaced, and in some cases increased in size.
Surface Permeability/ Urban Infill	New developments on Peninsula	Several new residential and industrial developments have been constructed, with more to follow.	More runoff as surface permeability decreases.

4.1 Demand – Specifically Climate Change

The cities of Port Adelaide-Enfield, Charles Sturt, and West Torrens [comprising the Western Adelaide Planning Region], are in collaboration and have designed the AdaptWest Climate Change Adaptation Plan – which is supported and funded by State, Commonwealth and local government departments and agencies. The plan addresses key priorities for local council operations and decision-making, and informs our community and key stakeholders about opportunities for practical action to adapt to our changing climate.

The AdaptWest Climate Change Adaptation Plan looks 50 years into the future and shows how our Western Region weather patterns will develop over the next few decades. In short:

- Average annual temperatures are likely to rise by up to 2°C;
- Average rainfall will decrease by up to 20%, while rainfall intensity will increase: for each degree of global warming, extreme daily rainfall may increase by 7%.
- Heatwaves – sequences of three or more consecutive days with average temperatures of at least 32°C, are projected to increase from 1 in 20 years under the baseline period to one in every 3-5 years.
- The global mean sea level rise could be as much as 0.26 m, as warming of the ocean results in a 1.4°C rise in global sea surface temperatures.

The combined effects of sea level rise, storm surge and high volumes of stormwater runoff following high intensity rainfall events leads to significant inundation of land, transport routes and commercial and industrial buildings. This has implications for the ongoing operation and viability of current business and industrial areas as well as those planned for potential future industrial development, particularly areas surrounding the Port River Estuary.

A number of investigations have been undertaken to better understand the impact of increases in rainfall intensity and sea level rise on the Port River Estuary.

The Port Adelaide/LeFevre Peninsula Port Adelaide River Seawall Study estimated the potential damages from the combined impacts of sea level rise and land subsidence and recommended seawall infrastructure upgrades. Image 6.4 details such recommendations.

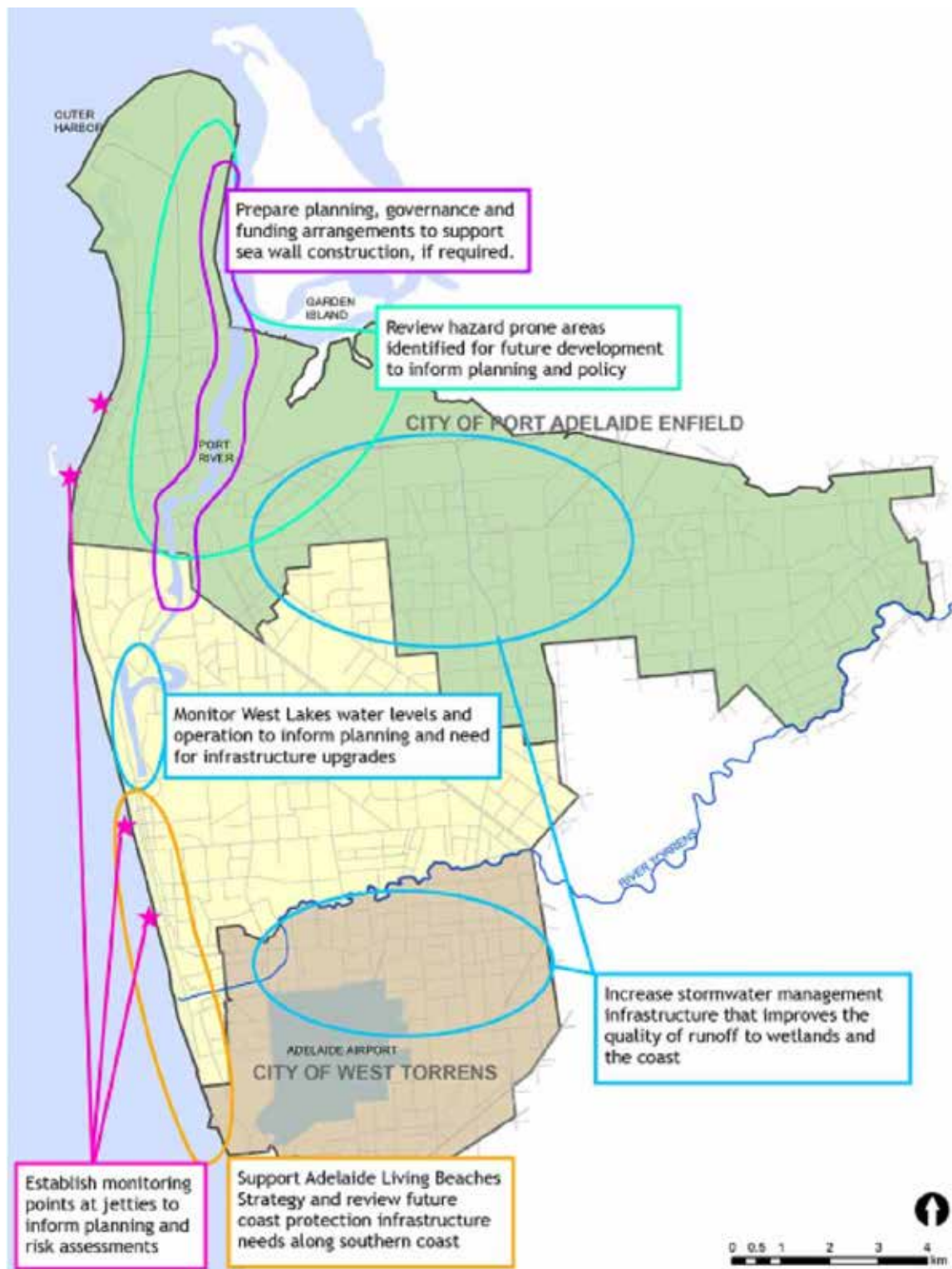


While many buildings in the Port River Estuary may be at risk of inundation in the future, some facilities such as the Australian Submarine Corporation have been constructed considering future sea levels.

An important adaptation option for further exploration by the Region is to limit further development or relocating development in hazard prone areas. The physical relocation of some assets and infrastructure away from high risk areas is expected to be necessary within a 20-year time frame – not long, given what's involved.

Source: www.adaptwest.com.au/

Figure 4.1: Adapt West identified opportunities for Infrastructure, Planning, and Policy



4.1 Demand Management Plan

Demand for new services will be managed through a combination of managing existing assets, upgrading of existing assets and providing new assets to meet demand and demand management. Demand management practices include non-asset solutions, insuring against risks and managing failures.

Non-asset solutions focus on providing the required service without the need for asset ownership and management actions including reducing demand for the service, reducing the level of service (allowing some assets to deteriorate beyond current service levels) or educating customers to accept appropriate asset failures³. Examples of non-asset solutions include having new developments raised out of the flood zone, and rainwater tanks installed in properties.

Opportunities identified to date for demand management are shown in Table 4.1. Further opportunities will be developed in future revisions of this asset management plan.

Table 4.1: Demand Management Plan Summary

Demand Driver	Impact on Services	Demand Management Plan
Sea Level – Climate Change and Land subsidence. Relative sea level will continue to rise	Existing services may be less able to cope with demand.	Stormwater modelling to account for land subsidence and increased sea levels. New developments to be built above flood level
Asset Integrity	Assets will deteriorate	Asset management plan being developed to account for this.
Urban Infill	Increased flows in stormwater system due to decreased surface permeability.	Stormwater modelling to account for less permeable surface leading to increased flow.

4.2 Asset Programs to meet Demand

The new assets required to meet population growth will be acquired free of cost from land developments and constructed/acquired. New assets constructed/acquired are discussed in Section 5.5.

It is planned over the next 10 years to perform numerous pumping capability upgrades, including;

- Increase pumping capacity at Hamilton, Hack and Midlunga Pump stations and;
- build new pump stations at Birkenhead and at Largs North.

The plans to build these are better known and hence 'constructed' assets are shown with a decent degree of certainty in the graph above. Contributed assets are based upon forecast population growth.

Acquiring these new assets will require a commitment to ongoing operations, maintenance and renewal costs for the period that the service provided from the assets is required. These future costs are identified and considered in developing forecasts of future operations, maintenance and renewal costs in Section 5.

³IPWEA, 2015, IIMM, Table 3.4.1, p 3|89.

5 LIFECYCLE MANAGEMENT PLAN



The lifecycle management plan details how the The City of Port Adelaide Enfield plans to manage and operate the assets at the agreed levels of service (defined in Section 3) while managing life cycle costs.

5.1 Background Data

5.1.1 Physical parameters

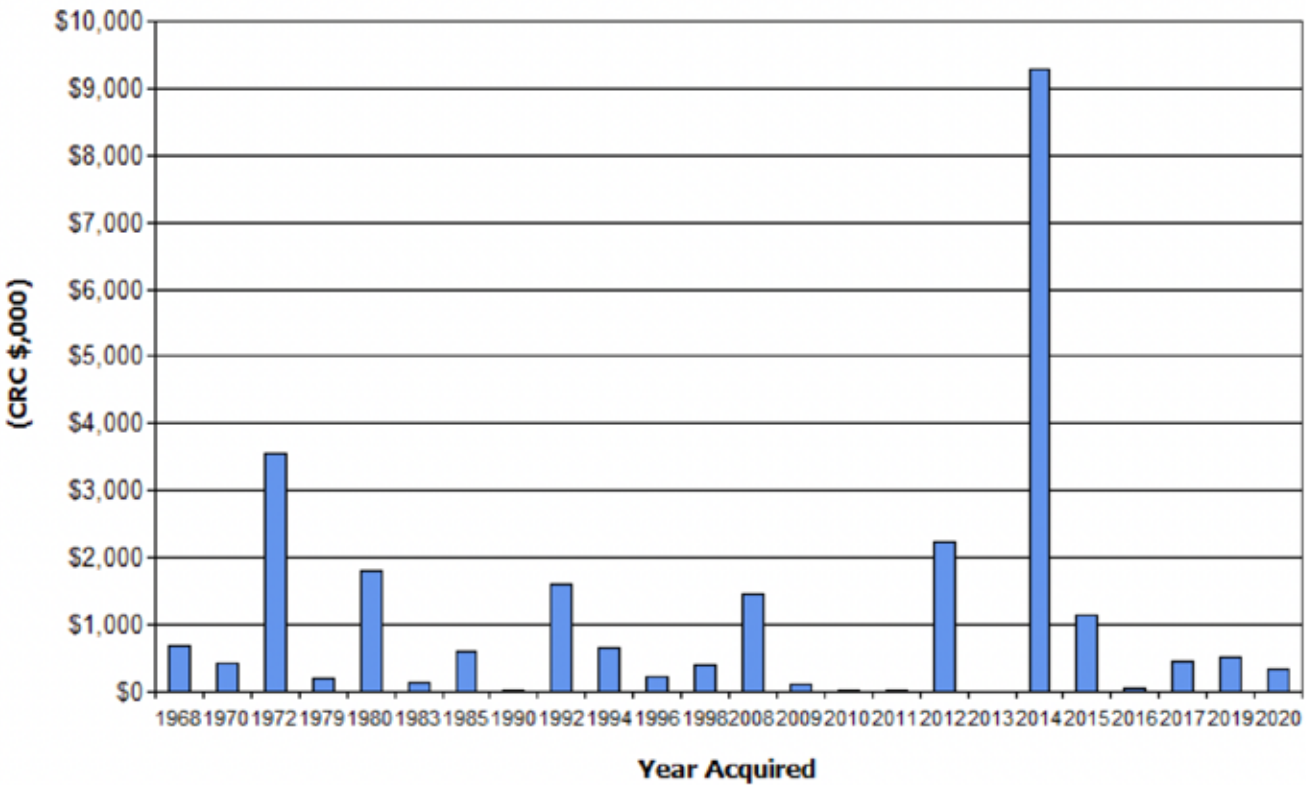
The assets covered by this asset management plan are shown in Table 2.1.

The majority of our pump stations were constructed as the Lefevre Peninsula area was developed in the 1960 to 1980s. In many cases the infrastructure has been maintained but not overhauled or updated since. The Hargrave pump station was constructed in 2014, and a major expansion at Hart St pump station was built in 2012, thus explaining the large spikes in recent history. This also highlights the under-valuation of the existing pump stations which account for materials and do not account for demolition, excavation, dewatering and modern day construction costs.

The age profile of the assets included in this AM Plan are shown in Figure 5.1.1.f

Table 5.1.1: Asset age profile

Figure 5.1.1: Asset Age Profile



5.1.2 Asset capacity and performance

Assets are generally provided to meet design standards where these are available. Locations where deficiencies in service performance are known are detailed in Table 5.1.2.

Table 5.1.2.1: Known Service Performance Deficiencies

Location	Service Deficiency
Hamilton St Pump Station	Pump station capacity, and network storage insufficient to prevent flooding.
Birkenhead Area (2.5kL/s)	Lulu Pump station poorly located for proper drainage.
Fletcher Rd Birkenhead (300L/s)*	Drainage falls insufficient as identified by Lefevre Peninsula Stormwater Management Plan (ECM Doc 8699684).
Charon Reserve Fort Largs (150L/s)*	
Creswell Rd Largs bay (3kL/s)*	
Hack St Pump Station	Pump station requires 0.6m ³ /s extra capacity.
Wellington Pump Station	Pump station requires a doubling of capacity from 2m ³ /s to 4m ³ /s
Midlunga Pump Station	Pump station requires capacity increase from 30L/s to 400L/s
Peterhead Area	Low lying area does not drain well, particularly at high tide.

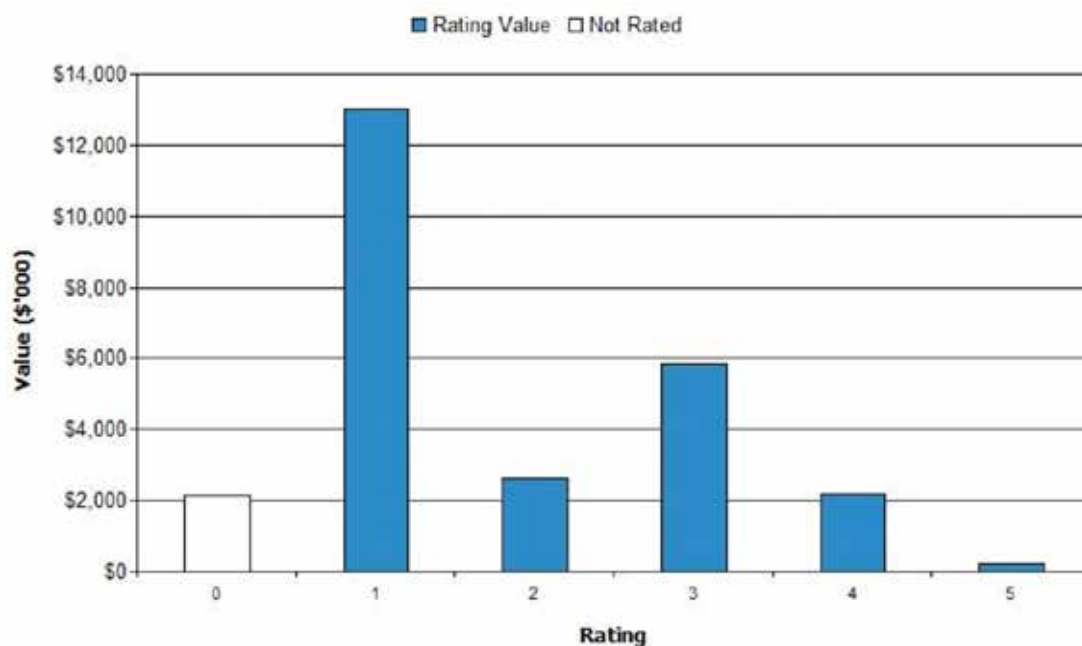
*The above service deficiencies were identified from the Lefevre Peninsula and Port River East Stormwater Management Plans created in 2016 and 2019 respectively.

5.1.3 Asset condition

Condition is monitored by inspection and analysis of the assets. The conditions of the assets tend to be skewed by the fact that the newer pump stations are more accurately valued, and all of the new assets can be classed as in very good condition. Because the pump stations are such critical assets any poorly rated assets must be made a priority.

The condition profile of our assets is shown in Figure 5.1.3.1.

Fig 5.1.3.1: Asset Condition Profile



Assets have been inspected within the last 2 years where possible. Some assets such as rising mains present significant challenges to inspect, and as such have not been completed to inspect

Condition is measured using a 1 – 5 grading system as detailed in Table 5.1.3.2.

Table 5.1.3.2: Simple Condition Grading Model

Condition Grading	Description of Condition
1	Very Good: 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: physically unsound and/or beyond rehabilitation

5.1.4 Asset valuations

The value of assets recorded in the asset register as at 30 June 2019 is shown below. Assets are valued at:

Gross Replacement Cost	\$26,228,000
Depreciable Amount	\$8,528,000
Depreciated Replacement Cost ⁶	\$17,670,000
Annual Depreciation	\$610,500

Useful lives were reviewed in 2019 by comparison with standard lives across council for similar assets, and adjustment to observed rates of deterioration. Key assumptions made in preparing the valuations were:

- Deterioration of assets will occur at a consistent rate regardless of build quality, which is variable
- Land value has not been incorporated
- Valuations by consultant for existing pump stations are assumed to be the present day construction costs and as such does not include excavation, dewatering and many other construction related costs.

Major changes from previous valuations are due to inflation, and a different accounting firm being used for the valuations.

Various ratios of asset consumption and expenditure have been prepared to help guide and gauge asset management performance and trends over time.

Rate of Annual Asset Consumption **2.3%**
(Depreciation/Depreciable Amount)

Rate of Annual Asset Renewal **4%**
(Capital renewal expenditure/Depreciable amount)

In 2021 the City of Port Adelaide Enfield will renew assets at 178.5% of the rate they are being consumed and will be increasing its asset stock by 7.2% in the year.

5.2 Operations and Maintenance Plan

Operations include regular activities to provide services, e.g. Pit cleaning, generator maintenance, pump oiling and trash rack cleaning.

Routine maintenance is the regular on-going work that is necessary to keep assets operating, including instances where portions of the asset fail and need immediate repair to make the asset operational again, e.g. clearing blockages.

⁶Also reported as Written Down Value, Carrying or Net Book Value.

5.2.1 Operations and Maintenance Plan

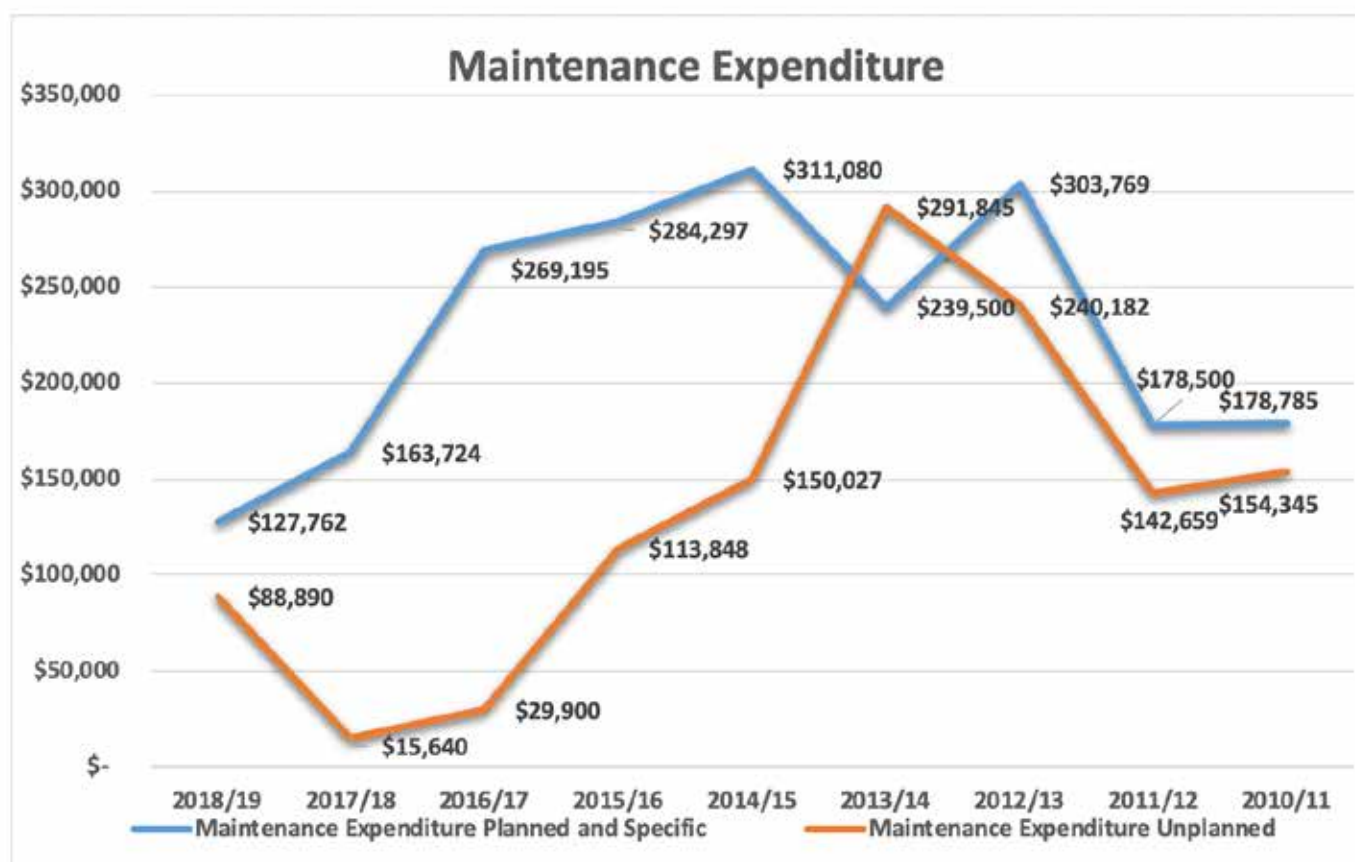
Maintenance includes all actions necessary for retaining an asset as near as practicable to an appropriate service condition including regular ongoing day-to-day work necessary to keep assets operating, but excluding rehabilitation or renewal. Maintenance may be classified into reactive, planned and specific maintenance work activities.

Reactive maintenance is unplanned repair work carried out in response to service requests and management/supervisory directions.

Planned maintenance is repair work that is identified and managed through a maintenance management system 'Infor Pubic Sector' (IPS). Activities include inspection, assessing the condition against failure/breakdown experience, priority of works, scheduling, actioning the work and reporting what was done to develop a maintenance history and improve maintenance and service delivery performance.

Actual past maintenance expenditure is shown in Table 5.2.1.

Table 5.2.1: Maintenance Expenditure Trends



From 2016 to 2019 planned maintenance work has been 81% of total maintenance expenditure.

Maintenance expenditure levels are considered to be adequate to meet projected service levels. Where maintenance expenditure levels are such that will result in a lesser level of service, the service consequences and service risks have been identified and service consequences highlighted in this AM Plan and service risks considered in the Infrastructure Risk Management Plan.

Assessment and priority of reactive maintenance is undertaken by staff using experience and judgement.

5.2.2 Operations and Maintenance Strategies

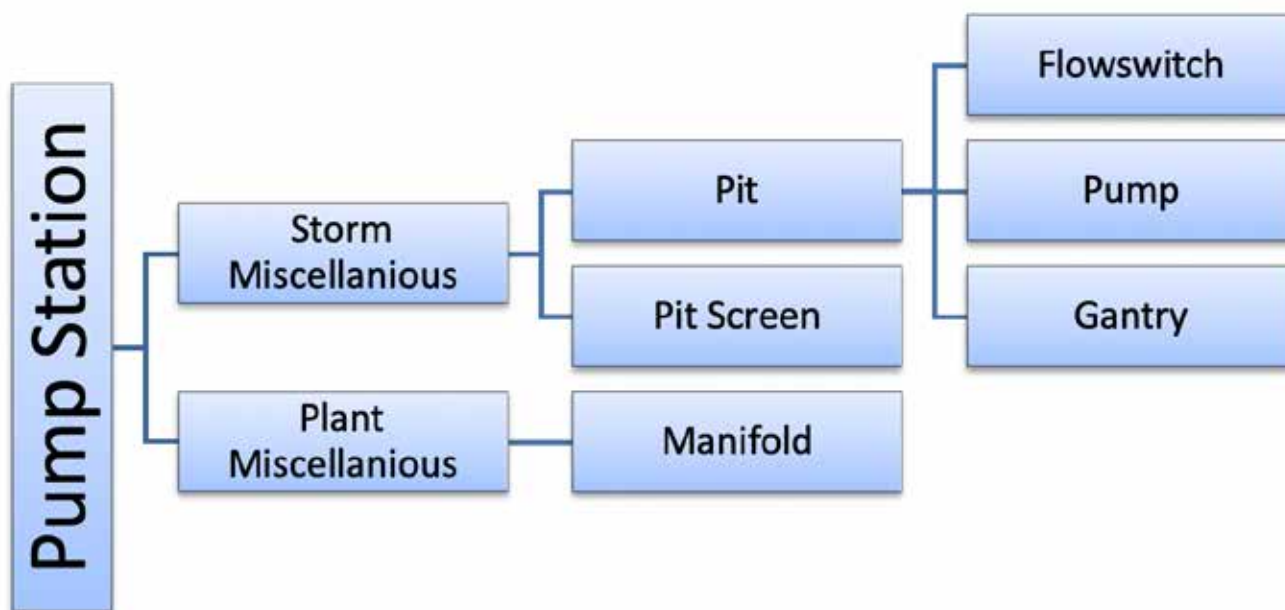
The City of Port Adelaide Enfield will operate and maintain assets to provide service to approved budgets in the most cost-efficient manner. The operation and maintenance activities include:

- Scheduling operations activities to deliver the service in the most efficient manner,
- Undertaking maintenance activities through a planned maintenance system to reduce maintenance costs and improve maintenance outcomes. Undertake cost-benefit analysis to determine the most cost-effective split between planned and unplanned maintenance activities (50 – 70% planned desirable as measured by cost),
- Maintain a current infrastructure risk register for assets and present service risks associated with providing services from infrastructure assets and reporting Very High and High risks and residual risks after treatment to management,
- Review current and required skills base and implement workforce training and development to meet required operations and maintenance needs,
- Review asset use to identify under used assets and appropriate remedies, and over used assets and customer demand management options,
- Maintain a current hierarchy of critical assets and required operations and maintenance activities,
- Develop and regularly review appropriate emergency response capability,
- Review management of operations and maintenance activities to ensure best value for the resources used.

Asset hierarchy

An asset hierarchy provides a framework for structuring data in an information system to assist in collection of data, reporting information and making decisions. The hierarchy includes the asset class and component used for asset planning and financial reporting and service level hierarchy used for service planning and delivery. The service hierarchy is shown in Table 5.2.2.1.

Table 5.2.2: Asset Service Hierarchy





Critical Assets

Critical assets are those assets which have a high consequence of failure but not necessarily a high likelihood of failure. By identifying critical assets and critical failure modes, investigative activities, maintenance plans and capital expenditure plans can be targeted at the appropriate time.

Operations and maintenances activities may be targeted to mitigate critical assets failure and maintain service levels. These activities may include increased inspection frequency, higher maintenance intervention levels, etc. Critical assets failure modes and required operations and maintenance activities are detailed in Table 5.2.2.2.

Figure 5.2.3: Projected Operations and Maintenance Expenditure

Critical Assets	Critical Failure Mode	Operations & Maintenance Activities
Pumps	Pump failure	Regular servicing and testing of pumps,
Level Sensors	False or no reading	Built in redundancy, and reliable sensors used
Pump Switchboard	Short Circuit, Over current	Regular maintenance of switchboard,
Generator	Generator Breakdown	Regular servicing and testing of generators,
Telemetry	No remote display or SMS alerts	Check telemetry before and during storm events, test message sent every weekday to verify SMS system active.
Remote Terminal Unit (RTU)	Programming error	Use standardised robust systems

Standards and specifications

Maintenance work is carried out in accordance with the following Standards and Specifications.

- Pump Stations Weekly Inspection Checklist in IPS
- Newhaven Village weekly maintenance and report

5.2.3 Summary of future operations and maintenance expenditures

Future operations and maintenance expenditure is forecast to trend in line with the value of the asset stock as shown in Figure 4. Note that all costs are shown in current 2019/ 2020 dollar values (i.e. real values).

The Operations and Maintenance expenditure will be required to increase as additional pumping capacity in the form of new pump stations and expansions to existing pump stations are added to the network.

Deferred maintenance, i.e. works that are identified for maintenance and unable to be funded are to be included in the risk assessment and analysis in the infrastructure risk management plan.

Maintenance is funded from the operating budget. This is further discussed in Section 7.



5.3 Renewal/Replacement Plan

Renewal and replacement expenditure is major work which does not increase the asset's design capacity but restores, rehabilitates, replaces or renews an existing asset to its original service potential. Work over and above restoring an asset to original service potential is upgrade/expansion or new works expenditure resulting in additional future operations and maintenance costs.

5.3.1 Renewal plan

Assets requiring renewal/replacement are identified from one of three methods provided in the 'Expenditure Template'.

- Method 1 uses Asset Register data to project the renewal costs using acquisition year and useful life to determine the renewal year, or
- Method 2 uses capital renewal expenditure projections from external condition modelling systems (such as Pavement Management Systems), or
- Method 3 uses a combination of average network renewals plus defect repairs in the Renewal Plan and Defect Repair Plan worksheets on the 'Expenditure template'.

Method 2 was used for this asset management plan.

The useful lives of assets used to develop projected asset renewal expenditures are shown in Table 5.3.1. Asset useful lives were last reviewed in 2020.

Table 5.3.1: Useful Lives of Assets

Asset (Sub)Category	Useful life (Years)
Trash Screens	30
Gantries (Structure)	60
Gantries (Hoist)	15
Pumps	20 - 35
Sensors	5 - 10
Fences	40
Generators	40
Platforms	40-55
Electrical	30
Pits	60

The useful lives for steel assets at Mersey Rd pump station tends to be reduced due to the effects of corrosive gasses unique to that site.

5.3.2 Renewal and Replacement Strategies

We will plan capital renewal and replacement projects to meet level of service objectives and minimize infrastructure service risks by:

- Planning and scheduling renewal projects to deliver the defined level of service in the most efficient manner,
- Undertaking project scoping for all capital renewal and replacement projects to identify:
 - the service delivery 'deficiency', present risk and optimum time for renewal/replacement,
 - the project objectives to rectify the deficiency,
 - the range of options, estimated capital and life cycle costs for each options that could address the service deficiency,
 - and evaluate the options against adopted evaluation criteria, and
 - select the best option to be included in capital renewal programs,

- Using 'low cost' renewal methods (cost of renewal is less than replacement) wherever possible,
- Maintain a current infrastructure risk register for assets and service risks associated with providing services from infrastructure assets and reporting Very High and High risks and residual risks after treatment to management,
- Review current and required skills base and implement workforce training and development to meet required construction and renewal needs,
- Maintain a current hierarchy of critical assets and capital renewal treatments and timings required ,
- Review management of capital renewal and replacement activities to ensure the best value for resources used is obtained.

Renewal ranking criteria

Asset renewal and replacement is typically undertaken to either:

- Ensure the reliability of the existing infrastructure to deliver the service it was constructed to facilitate (e.g. replacing a bridge that has a 5 t load limit), or
- To ensure the infrastructure is of sufficient quality to meet the service requirements (e.g. roughness of a road)⁸.

It is possible to get some indication of capital renewal and replacement priorities by identifying assets or asset groups that:

- Have a high consequence of failure,
- Have high use and subsequent impact on users would be greatest,
- Have a total value represents the greatest net value,
- Have the highest average age relative to their expected lives,
- Are identified in the AM Plan as key cost factors,
- Have high operational or maintenance costs, and
- Have replacement with a modern equivalent asset that would provide the equivalent service at a saving⁹.

Renewal and replacement standards

Renewal work is carried out in accordance with the following Standards and Specifications.

- **CoPAE – Stormwater pump station telemetry an controls specification**
- **AS4418.1-1996 Supervisory Control and Data Acquisition**
- **CoPAE - Stormwater Pump Replacement Specification**

5.3.3 Summary of future renewal and replacement expenditure

Projected future renewal and replacement expenditures are forecast to increase over time when the asset stock increases. The expenditure is required is shown in Fig 5. Note that all amounts are shown in real values.

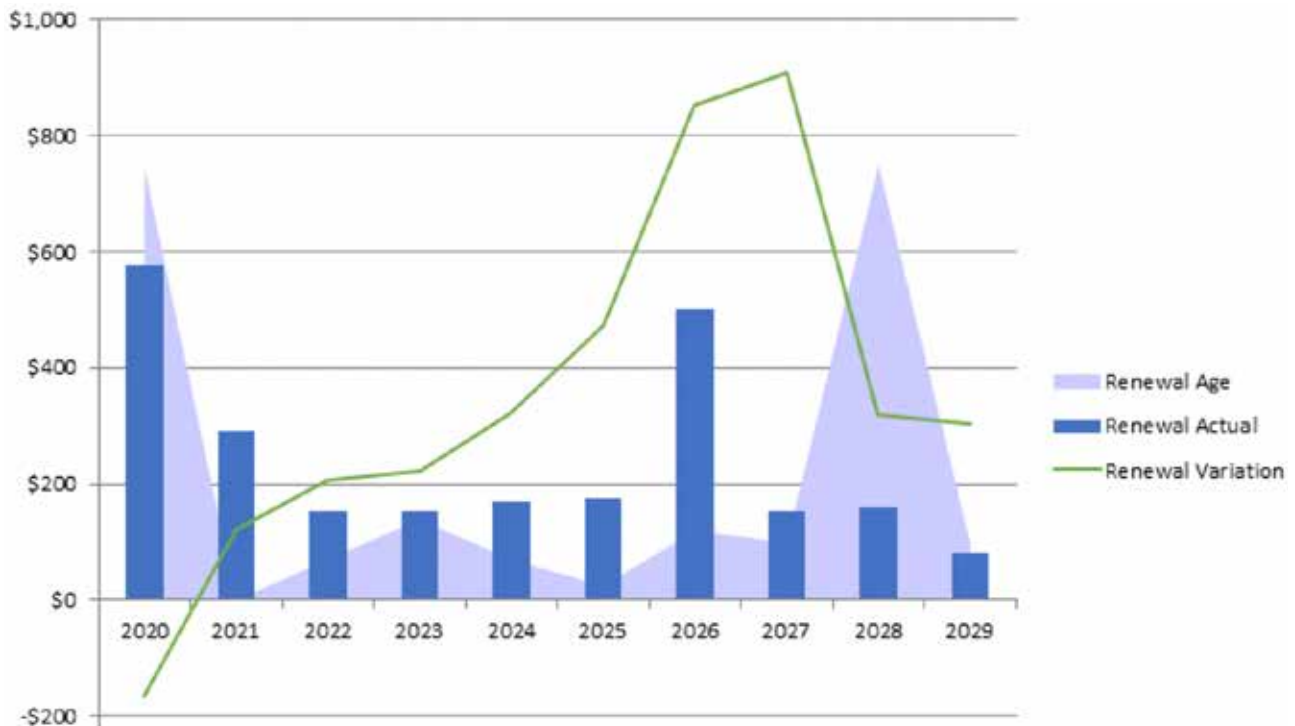
The projected capital renewal and replacement program is shown in Appendix B.

Figure 5.3.3 Assets are being renewed at an equivalent rate to depletion overall, though not necessarily year on year.

⁸IPWEA, 2015, IIMM, Sec 3.4.4, p 3|91.

⁹Based on IPWEA, 2015, IIMM, Sec 3.4.5, p 3|97.

Figure 5.3.3 Assets are being renewed at an equivalent rate to depletion overall, though not necessarily year on year.



There is increased renewal expenditure due to switchboard and generator replacements scheduled for Hack North Pump Station in 2020/20 and Carlisle Pump Station in 2026/27.

Deferred renewal and replacement, i.e. those assets identified for renewal and/or replacement and not scheduled in capital works programs are to be included in the risk analysis process in the risk management plan.

The level of our planned investment is based upon inspection and review of component age. This controls risk better than age based accounting.

Renewals and replacement expenditure in the capital works program will be accommodated in the long term financial plan. This is further discussed in Section 7.

5.4 Creation/Acquisition/Upgrade Plan

New works create a new asset that did not previously exist, or works which upgrade or improve an existing asset beyond its existing capacity. They may result from growth, social or environmental needs. Assets may also be acquired at no cost. These additional assets are considered in Section 4.4.

5.4.1 Selection criteria

New assets and upgrade/expansion of existing assets are identified from storm water management plans, which computer model existing capability against expected rainfall to identify shortfalls. Where applicable to the problem and no other gravity based solutions are appropriate, Candidate proposals are inspected to verify need and to develop a preliminary renewal estimate. Verified proposals are ranked by priority and available funds and scheduled in future works programmes.

5.4.3 Summary of future upgrade/new assets expenditure

Major projects planned over the next 10 years which will result in new assets, and significant capital upgrades include:

- 2020/21 –
 - Increase pumping capability at Hack North Pump Station, and
 - Dispose of the Newhaven Village Recycled Water Scheme
- 2023/24 – Upgrade Midlunga Pump Station and Rising Main (pending council decision)
- 2024/25 & 2025/26 – Build new Pump Station at Jetty Rd Largs Bay (pending council decision)
- 2028/2029 & 2029/2030 – Capacity upgrade to Wellington St Pump Station Port Adelaide (pending council decision)

Expenditure on new assets and services in the capital works program will be accommodated in the long term financial plan. This is further discussed in Section 7.2.

5.5 Disposal Plan

Disposal includes any activity associated with disposal of a decommissioned asset including sale, demolition or relocation. Assets identified for possible decommissioning and disposal are shown in Table 5.5, together with estimated annual savings from not having to fund operations and maintenance of the assets. These assets will be further reinvestigated to determine the required levels of service and see what options are available for alternate service delivery, if any. Any costs or revenue gained from asset disposals is accommodated in the long term financial plan.

Where cash flow projections from asset disposals are not available, these will be developed in future revisions of this asset management plan.



The Newhaven Village Wastewater Recycling scheme was gifted to the City of Port Adelaide in 1994 by The SA Housing Trust. Although the overall design is typically considered to be sound a poor economy of scale led to a treatment facility which was high maintenance, unreliable and has proven unable to reliably meet 'Class A' recycled water quality standards. For this reason since 2003 the recycled water has been disconnected from the reticulated scheme, and council is now forced to supply the residents with SA Waters product via the reticulated mains. The water can only be used for the underground irrigation of the adjacent reserve.

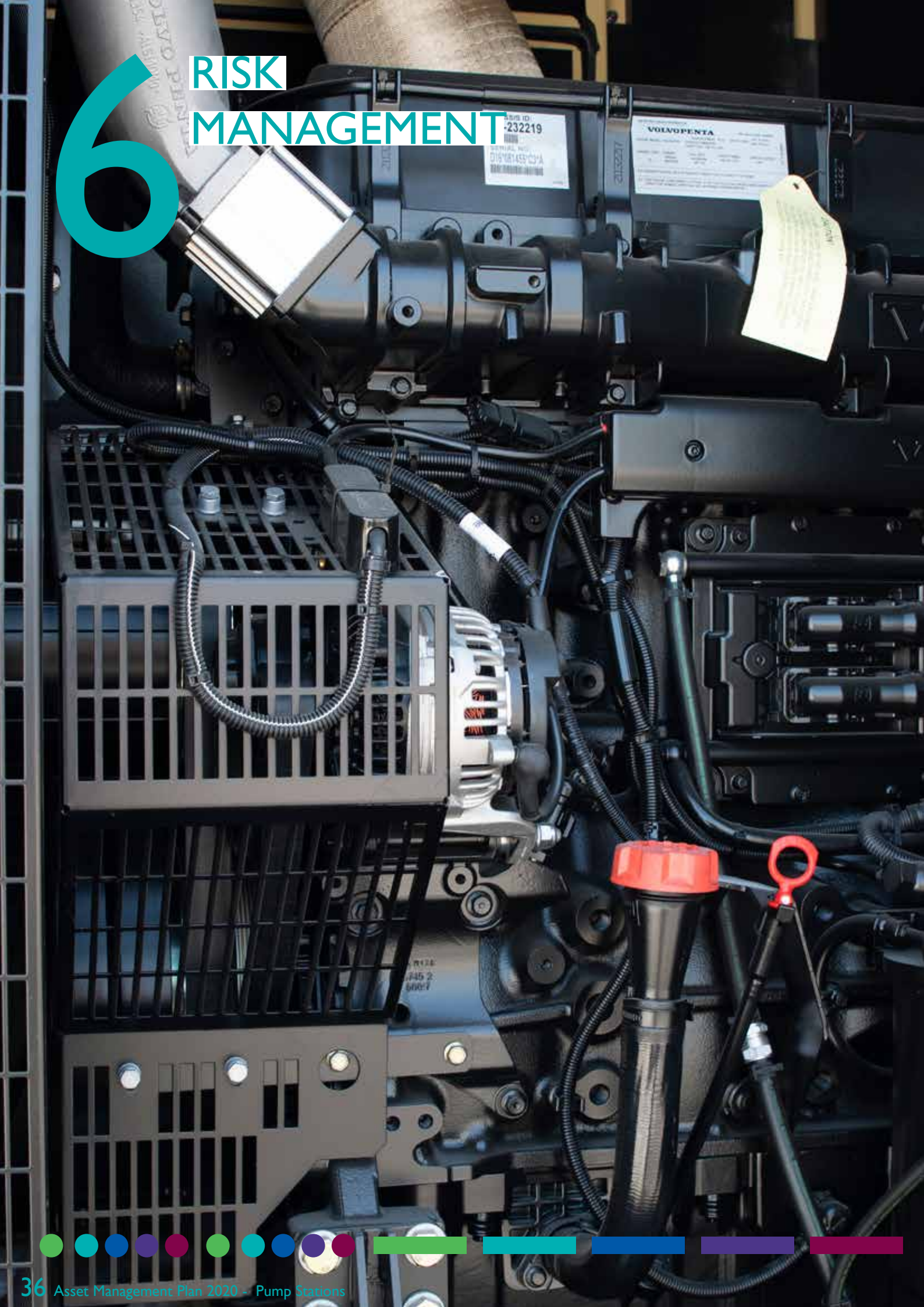
There are 65 properties feeding the Wastewater Treatment Plant which pay us a sewer fee totalling around \$35,000 p.a. The plant also saves around \$10k in potable water which would be used to water the adjacent park. The plant costs \$85,000 p.a to operate and maintain, not accounting for depreciation.

This is the only water or sewer system for which the City of Port Adelaide Enfield is responsible. Because of this city is not practical to have staff to deal with emergency responses to wastewater overflows or water main burst emergencies particularly after hours.

It is planned to dispose of this scheme by passing this facility on to a specialist operator of wastewater schemes under an owner operator arrangement. As part of such a handover several asset renewals and upgrades will be required.

6

RISK MANAGEMENT



The purpose of infrastructure risk management is to document the results and recommendations resulting from the periodic identification, assessment and treatment of risks associated with providing services from infrastructure, using the fundamentals of International Standard ISO 31000:2009 Risk management – Principles and guidelines.

Risk Management is defined in ISO 31000:2009 as: “coordinated activities to direct and control with regard to risk”¹⁰.

An assessment of risks¹¹ associated with service delivery from infrastructure assets has identified critical risks that will result in loss or reduction in service from infrastructure assets or a ‘financial shock’. The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, develops a risk rating, evaluates the risk and develops a risk treatment plan for non-acceptable risks.

6.1 Critical Assets

Critical assets are defined as those which have a high consequence of failure causing complete disablement of a stormwater pump station. Similarly, critical failure modes are those which have the highest consequences.

Critical assets have been identified, their typical failure mode and the impact on service delivery are as follows:

Table 6.1 Critical Assets

Critical Asset(s)	Failure Mode	Impact
Water Level Sensors	False or no reading	Pump station rendered ineffective
Pump station PLC (programming)	Programming Fault	Pump station rendered ineffective
Rising Main	Collapse, or blockage	Pump station rendered ineffective
Midlunga Pump Station	Failure of any asset	Pump Station rendered ineffective

By identifying critical assets and failure modes investigative activities, condition inspection programs, maintenance and capital expenditure plans can be targeted at the critical areas.

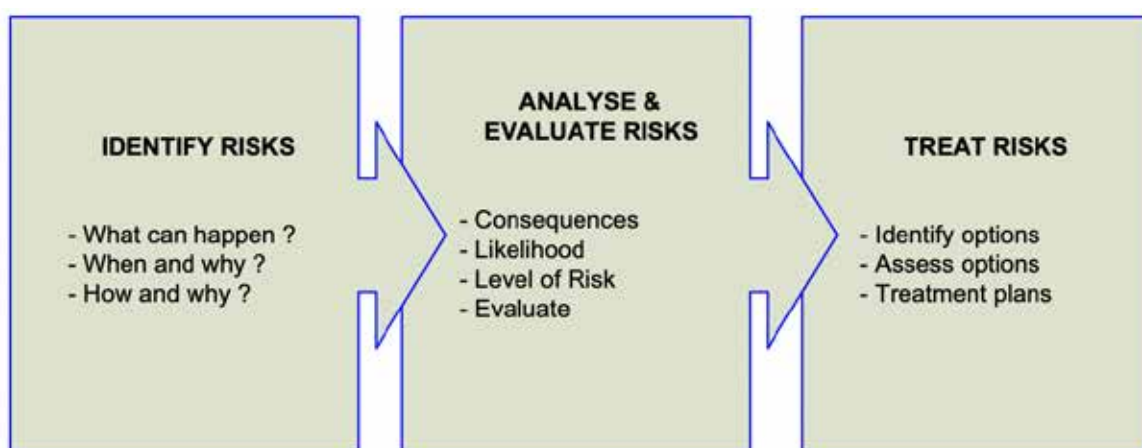
6.2 Risk Assessment

The risk management process used in this project is shown in Figure 6.2 below.

It is an analysis and problem solving technique designed to provide a logical process for the selection of treatment plans and management actions to protect the community against unacceptable risks.

The process is based on the fundamentals of ISO risk assessment standard ISO 31000:2009.

Fig 6.2 Risk Management Process – Abridged



¹⁰ISO 31000:2009, p 2

The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, develops a risk rating, evaluates the risk and develops a risk treatment plan for non-acceptable risks.

An assessment of risks associated with service delivery from infrastructure assets has identified the critical risks that will result in significant loss, 'financial shock' or a reduction in service.

Critical risks are those assessed with 'Very High' (requiring immediate corrective action) and 'High' (requiring corrective action) rating identified in the Infrastructure Risk Management Plan. The residual risk and treatment cost after the selected treatment plan is operational is shown in Table 6.2. These risks and costs are reported to management and council.

Table 6.2: Critical Risks and Treatment Plans

Risk Description	Risk Rating (VH, H)	Risk Treatment Plan	Residual Risk *	Additional Treatment Control	Risk Acceptable
Vandalism of pump stations	HIGH-B12	Upgraded fences to prevent graffiti, and installed monitored security alarms in pump station buildings to prevent sabotage of electrical assets. Locks on electrical panels and sumps at minor pump stations.	LOW-D2		Yes
Power outages at pump stations	HIGH-C12	Backup Power Generators installed at all major Stormwater Pump Stations. Wellington, Archie Badenoch and Perkins have a significant amount of detention. Hamilton Has a backup pump (started manually) Midlunga has a standpipe for connection of a mobile pump. Mersey, Hack & soon Lulu will have connection points for mobile generators as an additional backup Most pump stations have telemetry which will alarm in case of power outage or high water level prompting a response	MODERATE-B8	Install emergency generator connection points at Perkins & Archie Badenoch, completely replace Midlunga, incorporating an emergency generator connection point. Ensure that the new Pump Stations have adequate detention and emergency power connection.	Yes
Pump station flooding	HIGH-C12	Was an issue at Mersey Rd, raised pump station floor and switchboard out of flood zone in addition to fixing existing and adding an additional pump.	HIGH C12	Build new pump station at Midlunga	Yes
Multiple Pump Failure at pump stations	MODERATE D6	Fixed Systemic Issues leading to pump failures. At Hack west we fixed the electrical system which was tripping the pumps by replacing the switchboard and wiring. Replaced the most problematic pumps in the network with new ones. Ensured that there are at least two pumps at each station to provide redundancy (except at Midlunga)	LOW-E2	Retain external Standby pumps at depots. Increased reliability engineering for Hart PS. Build new pump station at Midlunga with at least two pumps to ensure redundancy	Yes
Rising main failure	LOW-E3	CCTVd Hack Rising Main in response to ongoing high current draw. Found partial blockage, which was cleared partly resolving the issue.	LOW-E3	CCTV Rising mains to confirm structural integrity	Yes
Wastewater Overflow	HIGH-B12	Upgraded electronics and communications to more reliably notify operators to high level and pump alarms	MODERATE D8	Handover system to specialist wastewater operator	Yes
Public ingestion of unsafe water	EXTREME A20	Disconnected all households from recycled water in 2007 Ongoing monitoring of wastewater product in accordance with SA Health requirements. Ongoing monitoring and maintenance of WWTP Water used for underground drip irrigation only.	MODERATE D8	Decommission WWTP, use mains water to irrigate park	Yes

Note * The residual risk is the risk remaining after the selected risk treatment plan is operational.

The risk assessment process compares the likelihood of a risk event occurring against the consequences of the event occurring. In the risk rating table below, a risk event with a likelihood of 'Possible' and a consequence of 'Major' has a risk rating of 'High' as shown in Table 6.3

Table 6.3: Risk Rating Matrix

LIKELIHOOD	Almost Certain	A-5	M (A5)	H (A10)	H (A15)	E (A20)	E (A25)
	Likely	B-4	M (B4)	M (B8)	H (B12)	H (B16)	E (B20)
	Possible	C-3	L (C3)	M (C6)	M (C9)	H (C12)	H (C15)
	Unlikely	D-2	L (D2)	M (D4)	M (D6)	M (D8)	H (D10)
	Rare	E-1	L (E1)	L (E2)	L (E3)	M (E4)	M (E5)
			1	2	3	4	5
			Insignificant	Minor	Moderate	Major	Catastrophic
			CONSEQUENCE				

Low Risk



7 FINANCIAL SUMMARY

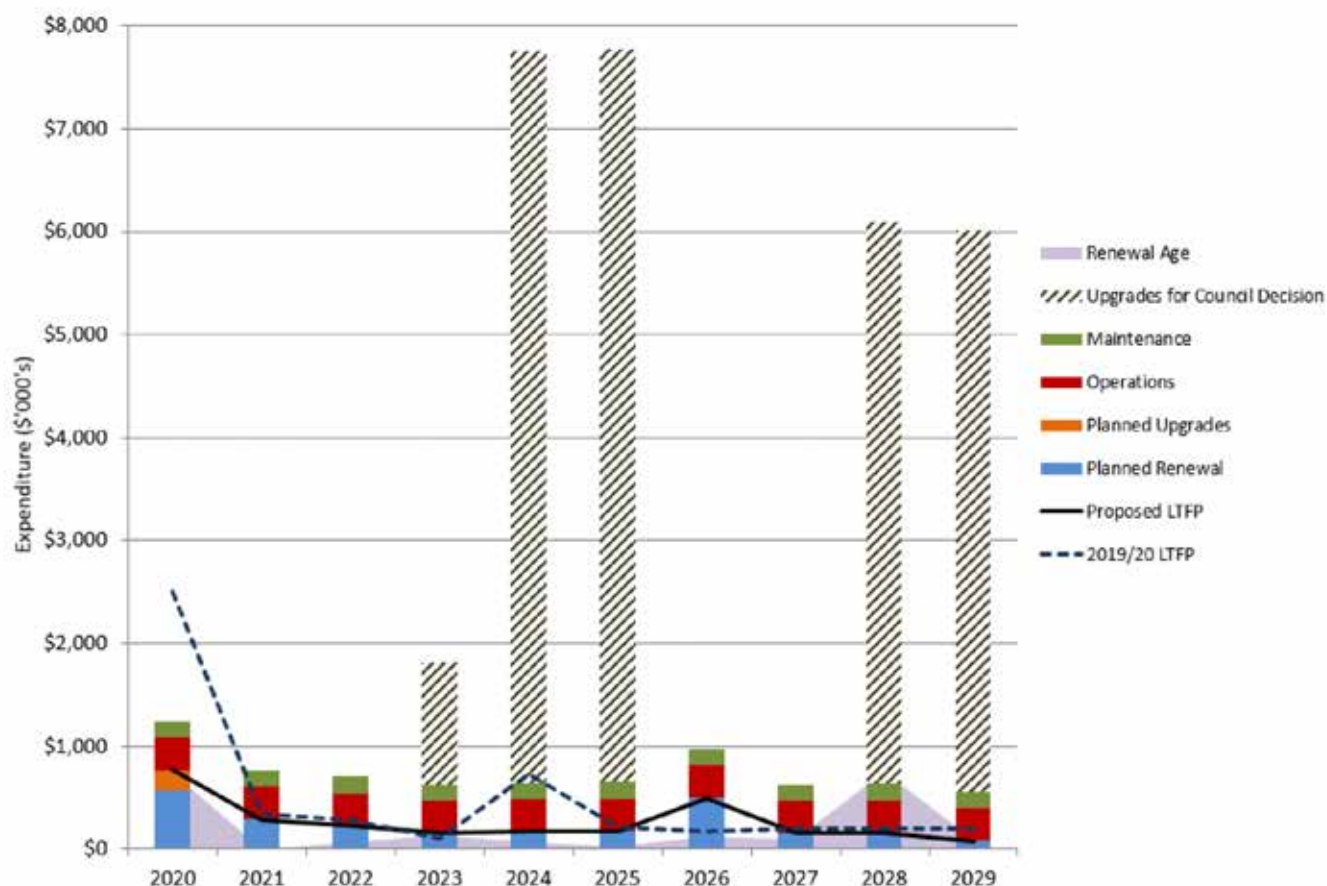


This section contains the financial requirements resulting from all the information presented in the previous sections of this asset management plan. The financial projections will be improved as further information becomes available on desired levels of service and current and projected future asset performance.

7.1 Financial Statements and Projections

The financial projections are shown in Fig 7.1 for projected operating (operations and maintenance) and capital expenditure (renewal and upgrade/expansion/new assets). Note that all costs are shown in real values.

Fig 7.1: Projected Operating and Capital Expenditure



Operations and maintenance expenditures is reasonably consistent, however the major projects mentioned in section 5.4.3 lead to large variations in upgrade expenditure.

7.1.1 Sustainability of service delivery

Council uses asset renewal funding ratio as its main indicator for sustainability that have been considered in the analysis of the services provided by this asset category, these being the asset renewal funding ratio, long term life cycle costs/expenditures and medium term projected/budgeted expenditures over 5 and 10 years of the planning period.

Asset Renewal Funding Ratio

Asset Renewal Funding Ratio¹⁴

109%

The Asset Renewal Funding Ratio is the most important indicator and reveals that over the next 10 years of the forecasting that we will have 109% of the funds required for the optimal renewal and replacement of assets. This is occurring as we are increasing pumping capacity and pump stations as well as maintaining those which are existing.

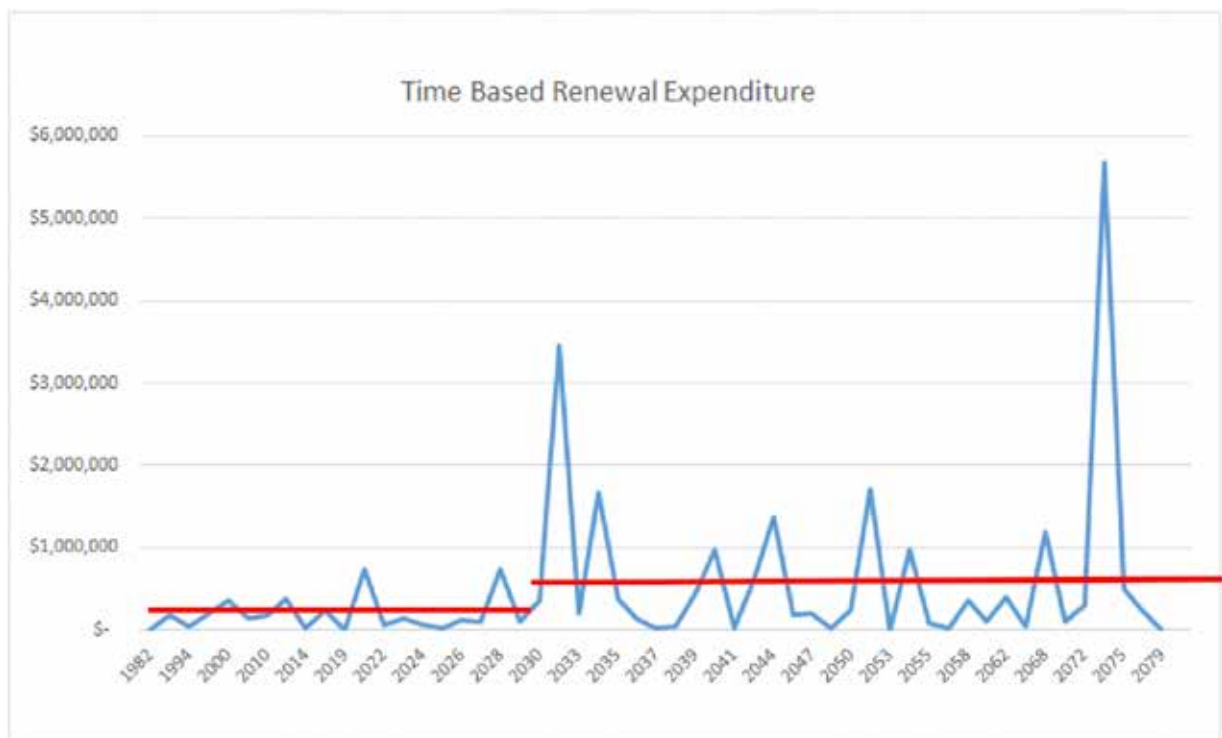
This Council uses the Asset Renewal Funding Ratio as it's indicator for Asset Management performance. The Asset Renewal Funding Ratio is defined as:

Asset renewal funding ratio

The ratio of the net present value of asset renewal funding accommodated over a 10 year period in a Long Term Financial Plan (LTFP) relative to the net present value of projected capital renewal expenditures identified in an asset management plan for the same period [AIFMG Financial Sustainability Indicator No 8].

Over the next 10 years the life cycle expenditure is fully funded. The reason for this discrepancy is that unlike other assets the pump stations began to be built from 1972 and the concrete and steel structures have a 60 year life, so no major pump stations are due to be completely rebuilt in the next 10 years, however the depreciation is being reported during this period.

Figure 7.1.1 Graph showing years at which assets are predicted to be due for renewal showing increase in average from 2030 onwards as pump stations come due for full replacement



Based upon expected lives, large scale replacement of pump stations will begin to be necessary from 2032. Hence there are no replacements covered by this 10 year plan, even though the depreciation which leads to this is counted now.

¹⁴AIFMM, 2015, Version 1.0, Financial Sustainability Indicator 3, Sec 2.6, p 9.

7.1.2 Projected expenditures for long term financial plan

Table 7.1.2 shows the projected expenditures for the 10 year long term financial plan.

Expenditure projections are in 2020 real values. Only projects endorsed by council have been included in these projections.

Table 7.1.2: Projected Expenditures for Long Term Financial Plan (\$000)

Year	Operations (\$000)	Maintenance (\$000)	Projected Capital Renewal (\$000)	Capital Upgrade/ New (\$000)	Disposals (\$000)
2020	\$318	\$160	\$717	\$200	\$0
2021	\$322	\$163	\$290	\$0	\$0
2022	\$322	\$163	\$230	\$0	\$0
2023	\$322	\$163	\$155	\$0	\$0
2024	\$322	\$163	\$170	\$0	\$0
2025	\$322	\$163	\$175	\$0	\$0
2026	\$322	\$163	\$500	\$0	\$0
2027	\$322	\$163	\$155	\$0	\$0
2028	\$322	\$163	\$160	\$0	\$0
2029	\$322	\$163	\$82	\$0	\$0

7.2 Funding Strategy

After reviewing service levels, as appropriate to ensure ongoing financial sustainability projected expenditures identified in Section 7.1.2 will be accommodated in the 10 year long term financial plan.

7.3 Forecast Reliability and Confidence

The expenditure and valuations projections in this AM Plan are based on best available data. Currency and accuracy of data is critical to effective asset and financial management. Data confidence is classified on a 5 level scale¹⁵ in accordance with Table 7.5.1.

Table 7.5.1: Data Confidence Grading System

Confidence Grade	Description
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 but up to 50% is extrapolated data and accuracy estimated $\pm 25\%$
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. Accuracy $\pm 40\%$
E. Unknown	None or very little data held.

¹⁵ IPWEA, 2015, IIMM, Table 2.4.6, p 2|71.

The estimated confidence level for and reliability of data used in this AM Plan is shown in Table 7.5.2.

Table 7.5.2: Data Confidence Assessment for Data used in AM Plan

Data	Confidence Assessment	Comment
Demand drivers	Reliable	Detailed modelling has been performed to account for the impact from urban infill. Climate change is less certain however.
Growth projections	Reliable	Based on Census data, and roughly conforms to known expansion projects
Operations expenditures	Reliable	Based on historic expenditure records – operations and maintenance are however combined in those records
Maintenance expenditures	Reliable	
Projected Renewal expenditures. - Asset values	Uncertain	M&E components based upon quotes. Pits and full pump stations will certainly cost more than predicted however as construction costs are underestimated.
- Asset useful lives	Reliable	These assets do not have a residual value
- Condition modelling	Uncertain	Mechanical assets can vary greatly in reliability, if the pits become unrepairable the entire station will require replacement.
- Network renewals	Uncertain	Condition data based upon visual inspections and reports from operators. Mechanical assets however do not deteriorate linearly,
- Defect repairs	Uncertain	As we are in our first generation of pump station pits it is uncertain as to how long they will actually last, and there is a good chance that it will be highly variable. If the pits are replaced it is likely that a new pump station would be built and the old one decommissioned.
Upgrade/New expenditures	Uncertain	Capital plan shows only one new pump station in the <u>short term</u> future, but a further 3 uncostered within the next 10 years. population growth has been used as a forecasting tool but greater clarity is expected for the next AMP.
Disposal expenditures	Reliable	The requirements from SA Water to divert sewage to the municipal system have been estimated but have some large areas of uncertainty which are yet to be determined. The eventual decommissioning of the WWTP is yet to be fully estimated. This is however a fairly minor cost overall.

Over all data sources the data confidence is assessed as medium confidence level for data used in the preparation of this AM Plan.



8 PLAN IMPROVEMENT AND MONITORING



8.1 Status of Asset Management Practices

8.1.1 Accounting and financial data sources

Assets are recorded at fair value in Council's financial management system (Technology I - Finance One) in the following classifications:

- Land
- Buildings
- Infrastructure
- Plant & Equipment
- Furniture & Fittings
- Waste Bins
- Software

8.1.2 Asset management data sources

Asset Management System

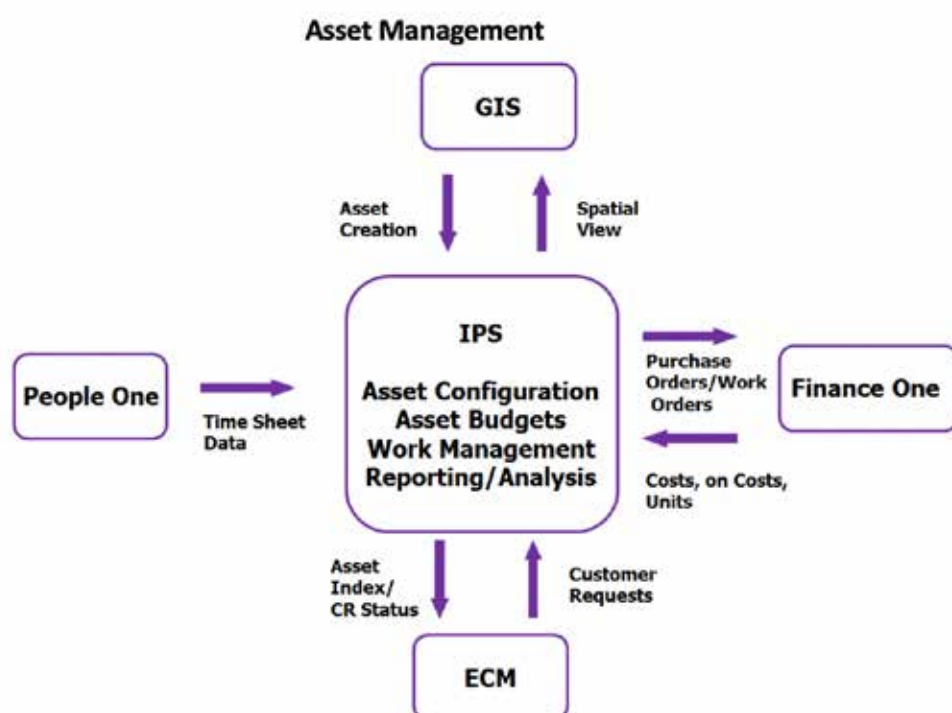
Infor IPS (Hansen).

Asset Registers

- Buildings
- Roads (Seal, Base, Kerb, Footpath)
- Parks and Gardens
- Stormwater
- Public Art
- Fleet

Linkage from Asset Management to Financial System

The Asset System Infor Public Sector (IPS) is integrated with the finance system (Technology One - Finance One), the payroll system (Technology One - People One), the GIS and the Council's electronic document Management System (Technology One - ECM). The linkages are shown graphically below.



Integration

Accountabilities for Asset Management System and Data Maintenance

- Team Leader Asset Planning
- Asset Planning
- Asset Support Officer
- Asset Accountant
- Asset Planning Engineer
- Manager Infrastructure and Asset Maintenance

Required Changes to Asset Management System arising from this Asset Management Plan

Additional component data will be collected, including overall condition ratings for components within all building classes. This data will be uploaded into IPS (Asset Management System).

8.2 Improvement Plan

The asset management improvement plan generated from this asset management plan is shown in Table 8.2.

Table 8.2: Improvement Plan

Item No	Description of Improvement	Responsibility	Timeline
1	Complete condition assessments for the pits at Hack Street West, and Wellington Pump Stations	Asset Planning	2020/21
2	Further review of asset register to ensure that all assets are covered	Asset Planning	Ongoing
3	Ongoing review of valuations data to enhance accuracy of replacement costs	Asset Planning	Ongoing
4	Ongoing review of risk register, and further review with field staff	Asset Planning	Ongoing
5	Include assets to be added to the pump station network in financial reports when projects are adopted by council.	Asset Planning	Ongoing

8.3 Monitoring and Review Procedures

This asset management plan will be reviewed during annual budget planning processes and amended to show any material changes in service levels and/or resources available to provide those services as a result of budget decisions.

The AM Plan will be updated annually to ensure it represents the current service level, asset values, projected operations, maintenance, capital renewal and replacement, capital upgrade/new and asset disposal expenditures and projected expenditure values incorporated into the long term financial plan.

The AM Plan has a life of 4 years (Council/Board election cycle) and is due for complete revision and updating every 2 years of each Council/Board election



8.4 Performance Measures

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

- The degree to which the required projected expenditures identified in this asset management plan are incorporated into the long term financial plan,
- The degree to which 1-5 year detailed works programs, budgets, business plans and corporate structures take into account the 'global' works program trends provided by the asset management plan,
- The degree to which the existing and projected service levels and service consequences (what we cannot do), risks and residual risks are incorporated into the Strategic Plan and associated plans,
- The Asset Renewal Funding Ratio achieving the target of 1.0.

9

REFERENCES



- IPWEA, 2006, 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/IIMM
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- IPWEA, 2015, 2nd edn., 'Australian Infrastructure Financial Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/AIFMM.
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- City of Port Adelaide Enfield, Annual Business Plan and Budget 2018-2019
- City of Port Adelaide Enfield 2016, Lefevre Peninsula Stormwater Management Plan, http://www.sma.sa.gov.au/wp-content/uploads/LefevrePeninsulaSMP2018_WEB.pdf
- City of Port Adelaide Enfield Port River East 2019, Stormwater Management Plan, ECM No 12104047





Appendix A Projected 10 year Capital Renewal and Replacement Works Program

Appendix B Projected 10 year Capital Upgrade/New Works Program

Appendix C LTFP Budgeted Expenditures Accommodated in AM Plan

Appendix A Projected 10-year Capital Renewal and Replacement Works Program

Projected Capital Renewal Works Program - Stormwater Pumps

(\$000)

Year	Item	Description	Estimate
2020/21		Network Renewals	
	1	Mersey Pump Station - Manifold re-coating and platform replacement	\$147
	2	Hack North Pump Station - Replace Generators and Electrical Switchboard, including capacity for 2 additional pumps	\$570
2020/21		Total	\$577

2021/22		Network Renewals	
	1	Replace Pumps & Valves #4 & #5 at Hart Pump Station	\$180
	2	Replace Submersible pump Carlisle	\$10
	3	Wellington Pump 3 - Refurbish Pump	\$55
	4	Inspect Rising Mains	\$30
	5	Replace Conductivity Level sensors with ultrasonic Sensors at Carlisle & Mersey Pump Stations	\$15
2021/22		Total	\$290

(\$000)

Year	Item	Description	Estimate
2022/23		Network Renewals	
	1	Replace Pumps & Valves #4 & #5 at Mersey Rd Pump Station	\$155
	2	Replace faulty Ultrasonic Levels sensors at Hargrave Pump Station	\$10
	3	De-bug programming faults at Hart St Pump Station	\$20
	4	Reliability Upgrade at Hart Pump Station	\$25
	5	Inspect Rising Mains	\$30
2022/23		Total	\$240

2023/24		Network Renewals	Estimate
	1	Replace pumps & Valves #2 & #6 Lulu Pump Station	\$155
2023/24		Total	\$155

(\$000)

Year	Item	Description	Estimate
2024/25		Network Renewals	
	1	Replace pumps & Valves #3 & #4 Lulu	\$155
	2	Replace level sensors at Hart Pump Station	\$15
2024/25		Total	\$170

2025/26		Network Renewals	
	1	Replace Crane Hoists at Wellington and Hack Pump Stations	\$20
	2	Replace pumps & Valves #5, #6 Hack North	\$155
2025/26		Total	\$175

(\$000)

Year	Item	Description	Estimate
2026/27		Network Renewals	
	1	Replace Cyclone mesh fence at Hack Pump Station	\$25
	2	Carlisle Replace Switchboard and Generator	\$320
	3	Replace Pumps 1 & 2 Carlisle Pump Station	\$155
2026/27		Total	\$500

2027/28		Network Renewals	
	1	Replace Pumps 3&4 Carlisle Pump Station	\$155
2027/28		Total	\$155

(\$000)

Year	Item	Description	Estimate
2028/29		Network Renewals	
	1	Replace Platforms at Hack Pump Station	\$60
	2	Rehabilitate Hart Pump Station Southern Pit	\$100
2028/29		Total	\$160

2029/30		Network Renewals	
	1	Replace Pumps 1 & 2 at Archie Badenoch Pump Station	\$20
	2	Replace Crane hoists 1 & 2 at Hargrave Pump Station	\$12
	3	Replace Ultrasonic Level sensors at all pump stations	\$50
2029/30		Total	\$82



Appendix B Projected Upgrade/Exp/New 10-year Capital Works Program

Projected Capital Upgrade/New Works Program - Stormwater Pumps

(\$000)

Year	Item	Description	Budget	Subject to Future Council report and Approval
2020/21	1	Hack North Pump Station - Install 2x new pumps to increase capacity	\$200	
	2	Newhaven Village Wastewater - disposal	\$1,300	
2020/21		Total	\$1,500	

(\$000)

Year	Item	Description	Estimate	
2021/22				
2021/22		Total	\$0	

(\$000)

Year	Item	Description	Estimate	
2022/23				
2022/23		Total	\$0	

(\$000)

Year	Item	Description	Estimate	
2023/24	1	Upgrade Midlunga Pump Station and Rising Main		\$1,185
2023/24		Total		\$1,185

(\$000)

Year	Item	Description	Estimate	
2024/25	1	Build New Pump Station Jetty Rd Largs Bay Stg 1		\$7,117
2024/25		Total		\$7,117

(\$000)

Year	Item	Description	Estimate	
2025/26	1	Build New Pump Station Jetty Rd Largs Bay Stg 2		\$7,118
2025/26		Total		\$7,118

(\$000)

Year	Item	Description	Estimate	
2026/27				
2026/27		Total	\$0	



Year	Item	Description	Estimate	
2027/28				
2027/28		Total	\$0	

(\$000)

Year	Item	Description	Estimate	
2028/29	1	Capacity upgrade to Wellington St Pump Station Port Adelaide stg 1		\$5,460
2028/29		Total		\$5,460

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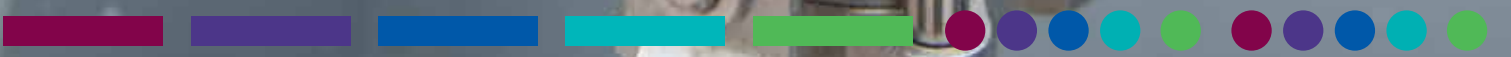
Year	Item	Description	Estimate	
2029/30	1	Capacity upgrade to Wellington St Pump Station Port Adelaide stg 2		\$5,460
2029/30		Total		\$5,460



Appendix C Budgeted Expenditures Accommodated in LTFP

Projected Capital Upgrade/New Works Program - Stormwater Pumps

NAMS.PLUS3 Asset Management			Port Adelaide Enfield CC							
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Stormwater Pumps_S2_V2			Asset Management Plan							
First year of expenditure projections 2020 (financial yr ending)										
Stormwater Pumps Asset values at start of planning period Current replacement cost \$26,304 (000) Depreciable amount \$26,304 (000) Depreciated replacement cost \$8,528 (000) Annual depreciation expense \$594 (000)			Calc CRC from Asset Register \$0 (000) This is a check for you.							
Planned Expenditures from LTFP 20 Year Expenditure Projections			Operations and Maintenance Costs for New Assets Additional operations costs 2.12% Additional maintenance 1.60% Additional depreciation 3.85% Planned renewal budget (information only)							
Note: Enter all values in current 2020 values			You may use these values calculated from your data or overwrite the links.							
Financial year ending	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000
Expenditure Outlays included in Long Term Financial Plan (in current \$ values)										
Operations										
Operations budget	\$318	\$318	\$318	\$318	\$318	\$318	\$318	\$318	\$318	\$318
Management budget	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
AM systems budget	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total operations	\$318	\$318	\$318	\$318	\$318	\$318	\$318	\$318	\$318	\$318
Maintenance										
Reactive maintenance budget	\$160	\$160	\$160	\$160	\$160	\$160	\$160	\$160	\$160	\$160
Planned maintenance budget	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Specific maintenance items budget	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total maintenance	\$160	\$160	\$160	\$160	\$160	\$160	\$160	\$160	\$160	\$160
Capital										
Planned renewal budget	\$1,060	\$166	\$290	\$93	\$275	\$215	\$179	\$200	\$200	\$200
Planned upgrade/new budget	\$1,450	\$170	\$0	\$15	\$0	\$0	\$0	\$0	\$0	\$0
Non-growth contributed asset value	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Asset Disposals										
Est Cost to dispose of assets	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Carrying value (DRC) of disposed assets	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Additional Expenditure Outlays Requirements (e.g from Infrastructure Risk Management Plan)										
Additional Expenditure Outlays required and not included above	2020 \$000	2021 \$000	2022 \$000	2023 \$000	2024 \$000	2025 \$000	2026 \$000	2027 \$000	2028 \$000	2029 \$000
Operations	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Maintenance	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Capital Renewal	to be incorporated into Forms 2 & 2.1 (where Method 1 is used) OR Form 2B Defect Repairs (where Method 2 or 3 is used)									
Capital Upgrade	\$55	\$15	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
User Comments #2										
Forecasts for Capital Renewal using Methods 2 & 3 (Form 2A & 2B) & Capital Upgrade (Form 2C)										
Forecast Capital Renewal from Forms 2A & 2B	2020 \$000	2021 \$000	2022 \$000	2023 \$000	2024 \$000	2025 \$000	2026 \$000	2027 \$000	2028 \$000	2029 \$000
	\$577	\$290	\$240	\$155	\$170	\$175	\$500	\$155	\$160	\$82
Forecast Capital Upgrade from Form 2C	\$1,500	\$0	\$0	\$1,185	\$7,117	\$7,118	\$0	\$0	\$5,460	\$5,460

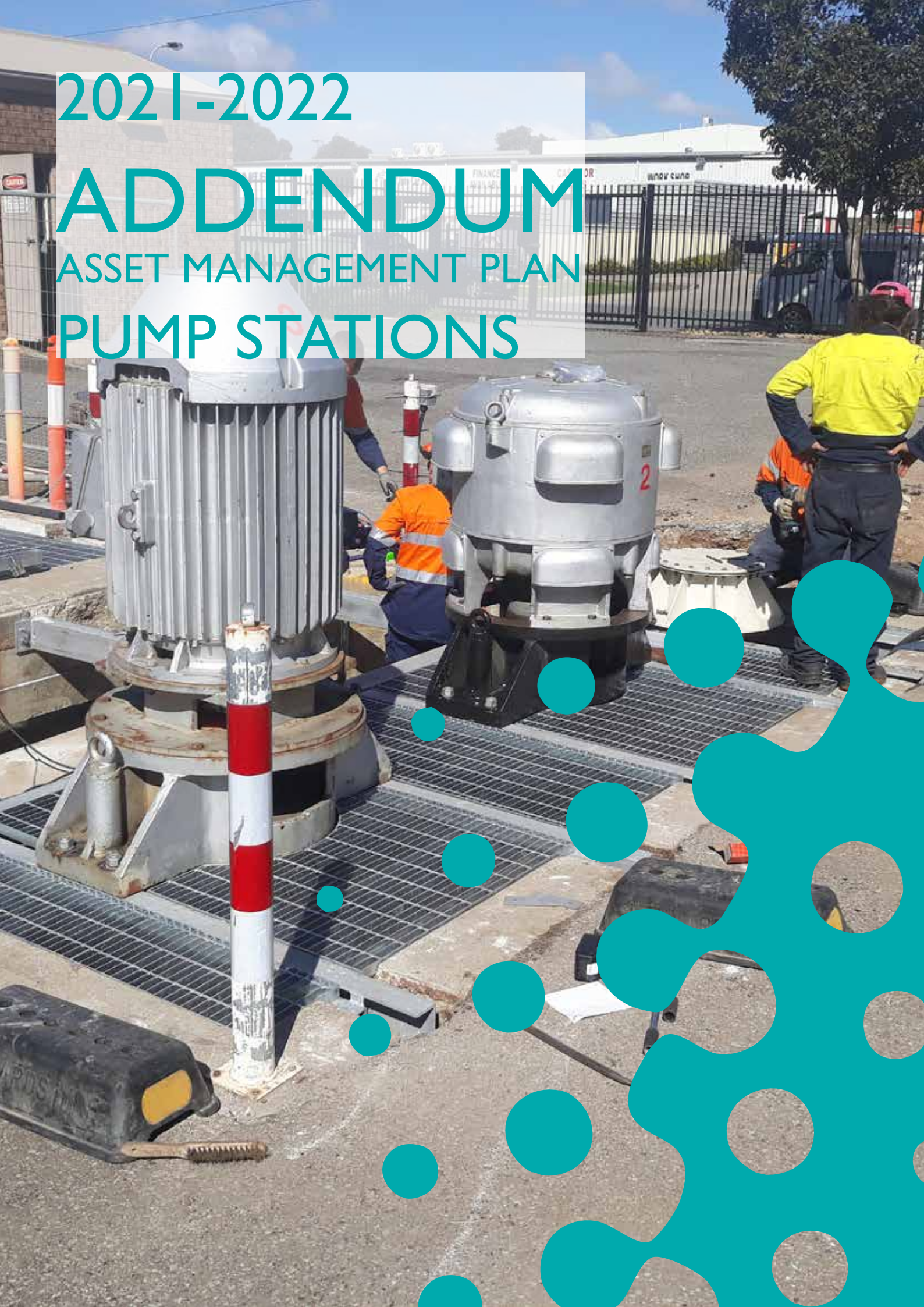


2021-2022

ADDENDUM

ASSET MANAGEMENT PLAN

PUMP STATIONS



Ten Year Program

	Year 1 2021/22	Year 2 2022/23	Year 3 2023/24	Year 4 2024/25	Year 5 2025/26	Year 6 2026/27	Year 7 2027/28	Year 8 2028/29	Year 9 2029/30	Year 10 2030/31
Stormwater AMP	Upgrade/New	\$10,550,000	\$7,300,000	\$5,470,000	\$6,145,000	\$7,120,000	\$7,125,000	\$8,605,000	\$8,805,000	
	Replacement	\$980,000	\$2,150,000	\$3,550,000	\$3,850,000	\$2,495,000	\$1,990,000	\$550,000	\$730,000	
	Total	\$11,530,000	\$9,450,000	\$9,020,000	\$9,995,000	\$9,615,000	\$9,115,000	\$9,155,000	\$9,535,000	
Pump Station AMP	Upgrade/New									
	Replacement	\$290,000	\$230,000	\$170,000	\$175,000	\$500,000	\$155,000	\$160,000	\$82,000	
	Total	\$290,000	\$230,000	\$170,000	\$175,000	\$500,000	\$155,000	\$160,000	\$82,000	
Total Combined AMP	Upgrade/New	\$10,550,000	\$7,300,000	\$5,470,000	\$6,145,000	\$7,120,000	\$7,125,000	\$8,605,000	\$8,805,000	
	Replacement	\$1,270,000	\$2,380,000	\$3,105,000	\$4,025,000	\$2,995,000	\$2,145,000	\$710,000	\$812,000	
	Total	\$11,820,000	\$9,680,000	\$9,190,000	\$10,170,000	\$10,115,000	\$9,270,000	\$9,315,000	\$9,617,000	
Revised Budget										
Stormwater	Upgrade/New	\$12,480,000	\$6,000,000	\$5,770,000	\$6,145,000	\$7,120,000	\$7,125,000	\$8,605,000	\$8,805,000	\$9,000,000
	Replacement	\$3,091,800	\$3,550,000	\$3,550,000	\$3,850,000	\$2,495,000	\$1,990,000	\$550,000	\$730,000	
	Total	\$15,571,800	\$9,550,000	\$10,410,000	\$9,995,000	\$9,615,000	\$9,115,000	\$9,155,000	\$9,535,000	\$9,000,000
Pump Stations	Upgrade/New	\$1,500,000			\$7,115,000			\$5,460,000	\$5,460,000	
	Replacement	\$710,000	\$240,000	\$275,000	\$215,000	\$179,000	\$200,000	\$200,000	\$200,000	\$200,000
	Total	\$2,210,000	\$240,000	\$7,392,000	\$7,330,000	\$179,000	\$200,000	\$5,660,000	\$5,660,000	\$200,000
Revised Budget	Upgrade/New	\$13,980,000	\$6,000,000	\$12,887,000	\$13,260,000	\$7,120,000	\$7,125,000	\$14,065,000	\$14,265,000	\$9,000,000
	Replacement	\$3,801,800	\$3,790,000	\$3,825,000	\$4,065,000	\$2,674,000	\$2,190,000	\$750,000	\$930,000	\$200,000
	Total	\$17,781,800	\$9,790,000	\$16,712,000	\$17,325,000	\$9,794,000	\$9,315,000	\$14,815,000	\$15,195,000	\$9,200,000
Variation										
		\$5,961,800	\$110,000	\$7,522,000	\$7,155,000	-\$321,000	\$45,000	\$5,500,000	\$5,578,000	\$9,200,000
		50%	1%	82%	70%	-3%	0%	59%	58%	

Revised Budget with CPI adjustment										
Stormwater	Upgrade/New	\$12,480,000	\$6,090,000	\$6,063,116	\$6,570,234	\$7,745,848	\$7,623,750	\$9,691,812	\$10,091,411	\$10,494,900
	Replacement	\$3,091,800	\$3,603,250	\$4,337,760	\$4,116,420	\$2,714,311	\$2,129,300	\$619,465	\$836,653	\$0
	Total	\$15,571,800	\$9,693,250	\$10,751,448	\$10,686,654	\$10,460,159	\$9,753,050	\$10,311,277	\$10,928,064	\$10,494,900
Pump Stations	Upgrade/New	\$1,500,000	\$0	\$0	\$7,607,358	\$0	\$0	\$6,149,598	\$6,257,706	\$0
	Replacement	\$710,000	\$243,600	\$288,970	\$229,878	\$194,734	\$214,000	\$225,260	\$229,220	\$233,220
	Total	\$2,210,000	\$243,600	\$160,084	\$7,837,236	\$194,734	\$214,000	\$6,374,858	\$6,486,926	\$233,220
Revised Budget	Upgrade/New	\$13,980,000	\$6,090,000	\$6,413,688	\$14,177,592	\$7,745,848	\$7,623,750	\$15,841,410	\$16,349,117	\$10,494,900
	Replacement	\$3,801,800	\$3,846,850	\$4,497,844	\$4,346,298	\$2,909,045	\$2,343,300	\$844,725	\$1,065,873	\$233,220
	Total	\$17,781,800	\$9,936,850	\$10,911,532	\$18,523,890	\$10,654,893	\$9,967,050	\$16,686,135	\$17,414,990	\$10,728,120
CPI Index %										
		1.50%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%
CPI Index factor										
		1.015	1.0328	1.0508	1.0692	1.0879	1.07	1.1263	1.1461	1.1661

2021/2022	NEW	REPLACED	TOTAL
Various Pump Station Inspect Rising Mains		\$30,000	\$30,000
PRE Wellington St Pump Station - Refurbish Pump 3		\$55,000	\$55,000
Lefevre Hart St Pump Station - Upgrade		\$600,000	\$600,000
Lefevre Carlisle and Mersey Pump Station - Conductivity and Level Sensors		\$15,000	\$15,000
Lefevre Carlisle Pump Station - Replace Submersible Pump		\$10,000	\$10,000
Lefevre Midlunga Pump Station and Rising Main Construction	\$1,500,000		\$1,500,000
Sub Total Cost of Proposed Construction	\$1,500,000	\$710,000	\$2,210,000

2022/2023	NEW	REPLACED	TOTAL
Hargrave St - Pump station alterations		\$10,000	\$10,000
Hart St - Reliability Upgrade		\$25,000	\$25,000
Hart St - Programming Upgrades		\$20,000	\$20,000
Mersey Rd - Replace Pumps & Valves #4 & #5		\$155,000	\$155,000
Various - Rising main inspections		\$30,000	\$30,000
Sub Total Cost of Proposed Construction	\$0	\$240,000	\$240,000

2023/2024	NEW	REPLACED	TOTAL
Lulu St - Replace pump and valves #2 & #6		155,000	155,000
Sub Total Cost of Proposed Construction	0	155,000	155,000

2024/2025	NEW	REPLACED	TOTAL
Lefevre - Lulu/Jetty Rd pump station	\$7,117,000		\$7,117,000
Overhaul 2 Pumps		\$40,000	\$40,000
PRE - Wellington – Paving renewal		\$80,000	\$80,000
PRE - Wellington Lighting		\$20,000	\$20,000
Lefevre - Carlisle Replace Generator		\$135,000	\$135,000
TOTAL	\$7,117,000	\$275,000	\$7,392,000

2025/2026	NEW	REPLACED	TOTAL
Lulu/Jetty Rd pump station	\$7,115,000		\$7,115,000
Overhaul 2 Pumps		\$40,000	\$40,000
Newhaven VVWPS Pits polyuria coating		\$50,000	\$50,000
Replace Switchboard Carlisle Pump Station		\$100,000	\$100,000
Replace Level sensors & Flammable Gas detection units Hargrave		\$15,000	\$15,000
Replace level sensors Hart		\$10,000	\$10,000
Total	\$7,115,000	\$215,000	\$7,330,000

2026/2027	NEW	REPLACED	TOTAL
Overhaul 2 Pumps		\$40,000	\$40,000
Replace trash screens Carlisle		\$10,000	\$10,000
Replace crane Pendant Lulu, Hack Wellington		\$25,000	\$25,000
Replace switchboard Wellington Pump Station		\$100,000	\$100,000
Replace pumps Newhaven WWPS*		\$4,000	\$4,000
Total	\$0	\$179,000	\$179,000

2027/2028	NEW	REPLACED	TOTAL
Various Pump Station upgrades		\$200,000	\$200,000
Total	\$0	\$200,000	\$200,000

2028/2029	NEW	REPLACED	TOTAL
Various Pump Station upgrades		\$200,000	\$200,000
Wellington St Pump Station Upgrade	\$5,460,000		\$5,460,000
Total	\$5,460,000	\$200,000	\$5,660,000

2029/2030	NEW	REPLACED	TOTAL
Various Pump Station upgrades		\$200,000	\$200,000
Wellington St Pump Station Upgrade	\$5,460,000		\$5,460,000
Total	\$5,460,000	\$200,000	\$5,660,000

2030/2031	NEW	REPLACED	TOTAL
Pump Station Major Replacements		\$200,000	\$200,000
Total	\$0	\$200,000	\$200,000



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