<table>
<thead>
<tr>
<th>Rev No</th>
<th>Date</th>
<th>Revision Details</th>
<th>Author</th>
<th>Reviewer</th>
<th>Approver</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>January 2009</td>
<td>Draft Version Completed</td>
<td>GF</td>
<td>PB</td>
<td>DP</td>
</tr>
<tr>
<td>1.1</td>
<td>8 December 2010</td>
<td>Adoption by Council</td>
<td>GF</td>
<td>PB</td>
<td>DP</td>
</tr>
<tr>
<td>1.2</td>
<td>30 March 2016</td>
<td>Updated revision</td>
<td>PB</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>ABREVIATIONS</th>
<th>GLOSSARY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## 1. EXECUTIVE SUMMARY.................................................................1
   - What Council Provides ................................................................1
   - What does it Cost? ......................................................................1
   - Plans for the Future ..................................................................1
   - Measuring our Performance .......................................................1
   - The Next Steps .........................................................................1

## 2. INTRODUCTION ..............................................................................1
   - 2.1 Background .........................................................................1
   - 2.2 Goals and Objectives of Asset Management ............................2
   - 2.3 Plan Framework ....................................................................3
   - 2.4 Core and Advanced Asset Management ..................................4

## 3. LEVELS OF SERVICE .......................................................................5
   - 3.1 Customer Research and Expectations ......................................5
   - 3.2 Legislative Requirements ......................................................6
   - 3.3 Current Levels of Service .....................................................7

## 4. FUTURE DEMAND ..........................................................................8
   - 4.1 Demand Forecast ...................................................................8
   - 4.2 Changes in Technology ........................................................8
   - 4.3 Demand Management Plan ....................................................9
   - 4.4 New Assets from Growth ......................................................9

## 5. LIFECYCLE MANAGEMENT PLAN ................................................11
   - 5.1 Background Data ....................................................................11
     - 5.1.1 Physical parameters ........................................................11
     - 5.1.2 Asset capacity and performance .......................................13
     - 5.1.3 Asset condition .................................................................13
     - 5.1.4 Asset valuations ...............................................................14
   - 5.2 Risk Management Plan ..........................................................14
   - 5.3 Routine Maintenance Plan .....................................................15
     - 5.3.1 Maintenance plan .............................................................15
     - 5.3.2 Standards and specifications ............................................16
     - 5.3.3 Summary of future maintenance expenditures ..................16
   - 5.4 Renewal/Replacement Plan ...................................................17
     - 5.4.1 Renewal plan ..................................................................17
     - 5.4.2 Renewal standards ...........................................................17
     - 5.4.3 Summary of future renewal expenditure ...........................17
   - 5.5 Creation/Acquisition/Upgrade Plan .........................................18
     - 5.5.1 Selection criteria ..............................................................18
     - 5.5.2 Standards and specifications ............................................19
     - 5.5.3 Summary of future upgrade/new assets expenditure ..........19
   - 5.6 Disposal Plan ..........................................................................20

## 6. FINANCIAL SUMMARY ....................................................................21
   - 6.1 Financial Statements and Projections .......................................21
     - 6.1.1 Sustainability of service delivery ......................................22
   - 6.2 Funding Strategy .....................................................................24
   - 6.3 Valuation Forecasts ...............................................................24
   - 6.4 Key Assumptions made in Financial Forecasts .......................25

## 7. ASSET MANAGEMENT PRACTICES ................................................26
   - 7.2 Asset Management Systems ..................................................26
   - 7.3 Information Flow Requirements and Processes .......................26

## 8. PLAN IMPROVEMENT AND MONITORING ....................................29
   - 8.1 Performance Measures ..........................................................29
   - 8.2 Improvement Plan ..................................................................29
   - 8.3 Monitoring and Review Procedures ........................................29

## REFERENCES ......................................................................................30

## APPENDICES .....................................................................................31
   - Appendix A ...............................................................................31
# ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAAC</td>
<td>Average annual asset consumption</td>
</tr>
<tr>
<td>AMP</td>
<td>Asset management plan</td>
</tr>
<tr>
<td>ARI</td>
<td>Average recurrence interval</td>
</tr>
<tr>
<td>BOD</td>
<td>Biochemical (biological) oxygen demand</td>
</tr>
<tr>
<td>CRC</td>
<td>Current replacement cost</td>
</tr>
<tr>
<td>CWMS</td>
<td>Community wastewater management systems</td>
</tr>
<tr>
<td>DA</td>
<td>Depreciable amount</td>
</tr>
<tr>
<td>DoH</td>
<td>Department of Health</td>
</tr>
<tr>
<td>EF</td>
<td>Earthworks/formation</td>
</tr>
<tr>
<td>IRMP</td>
<td>Infrastructure risk management plan</td>
</tr>
<tr>
<td>LCC</td>
<td>Life Cycle cost</td>
</tr>
<tr>
<td>LCE</td>
<td>Life cycle expenditure</td>
</tr>
<tr>
<td>MMS</td>
<td>Maintenance management system</td>
</tr>
<tr>
<td>PCI</td>
<td>Pavement condition index</td>
</tr>
<tr>
<td>RV</td>
<td>Residual value</td>
</tr>
<tr>
<td>SS</td>
<td>Suspended solids</td>
</tr>
<tr>
<td>vph</td>
<td>Vehicles per hour</td>
</tr>
</tbody>
</table>
GLOSSARY

Annual service cost (ASC)
An estimate of the cost that would be tendered, per annum, if tenders were called for the supply of a service to a performance specification for a fixed term. The Annual Service Cost includes operating, maintenance, depreciation, finance/ opportunity and disposal costs, less revenue.

Asset class
Grouping of assets of a similar nature and use in an entity's operations (AASB 166.37).

Asset condition assessment
The process of continuous or periodic inspection, assessment, measurement and interpretation of the resultant data to indicate the condition of a specific asset so as to determine the need for some preventative or remedial action.

Asset management
The combination of management, financial, economic, engineering and other practices applied to physical assets with the objective of providing the required level of service in the most cost effective manner.

Assets
Future economic benefits controlled by the entity as a result of past transactions or other past events (AAS27.12).

Property, plant and equipment including infrastructure and other assets (such as furniture and fittings) with benefits expected to last more than 12 month.

Average annual asset consumption (AAAC)*
The amount of a local government's asset base consumed during a year. This may be calculated by dividing the Depreciable Amount (DA) by the Useful Life and totalled for each and every asset OR by dividing the Fair Value (Depreciated Replacement Cost) by the Remaining Life and totalled for each and every asset in an asset category or class.

Brownfield asset values**
Asset (re)valuation values based on the cost to replace the asset including demolition and restoration costs.

Capital expansion expenditure
Expenditure that extends an existing asset, at the same standard as is currently enjoyed by residents, to a new group of users. It is discretionary expenditure, which increases future operating, and maintenance costs, because it increases council's asset base, but may be associated with additional revenue from the new user group, eg. extending a drainage or road network, the provision of an oval or park in a new suburb for new residents.

Capital expenditure
Relatively large (material) expenditure, which has benefits, expected to last for more than 12 months. Capital expenditure includes renewal, expansion and upgrade. Where capital projects involve a combination of renewal, expansion and/or upgrade expenditures, the total project cost needs to be allocated accordingly.

Capital funding
Funding to pay for capital expenditure.

Capital grants
Monies received generally tied to the specific projects for which they are granted, which are often upgrade and/or expansion or new investment proposals.

Capital investment expenditure
See capital expenditure definition

Capital new expenditure
Expenditure which creates a new asset providing a new service to the community that did not exist beforehand. As it increases service potential it may impact revenue and will increase future operating and maintenance expenditure.

Capital renewal expenditure
Expenditure on an existing asset, which returns the service potential or the life of the asset up to that which it had originally. It is periodically required expenditure, relatively large (material) in value compared with the value of the components or sub-components of the asset being renewed. As it reinstates existing service potential, it has no impact on revenue, but may reduce future operating and maintenance expenditure if completed at the optimum time, eg. resurfacing or resheeting a material part of a road network, replacing a material section of a drainage network with pipes of the same capacity, resurfacing an oval. Where capital projects involve a combination of renewal, expansion and/or upgrade expenditures, the total project cost needs to be allocated accordingly.

Capital upgrade expenditure
Expenditure, which enhances an existing asset to provide a higher level of service or expenditure that will increase the life of the asset beyond that which it had originally. Upgrade expenditure is discretionary and often does not result in additional revenue unless direct user charges apply. It will increase operating and maintenance expenditure in the future because of the increase in the council’s asset base, eg. widening the sealed area of an existing road, replacing drainage pipes with pipes of a greater capacity, enlarging a grandstand at a sporting facility. Where capital projects involve a combination of renewal, expansion and/or upgrade
expenditures, the total project cost needs to be allocated accordingly.

**Carrying amount**
The amount at which an asset is recognised after deducting any accumulated depreciation / amortisation and accumulated impairment losses thereon.

**Class of assets**
See asset class definition

**Component**
An individual part of an asset which contributes to the composition of the whole and can be separated from or attached to an asset or a system.

**Cost of an asset**
The amount of cash or cash equivalents paid or the fair value of the consideration given to acquire an asset at the time of its acquisition or construction, plus any costs necessary to place the asset into service. This includes one-off design and project management costs.

**Current replacement cost (CRC)**
The cost the entity would incur to acquire the asset on the reporting date. The cost is measured by reference to the lowest cost at which the gross future economic benefits could be obtained in the normal course of business or the minimum it would cost, to replace the existing asset with a technologically modern equivalent new asset (not a second hand one) with the same economic benefits (gross service potential) allowing for any differences in the quantity and quality of output and in operating costs.

**Current replacement cost “As New” (CRC)**
The current cost of replacing the original service potential of an existing asset, with a similar modern equivalent asset, i.e. the total cost of replacing an existing asset with an as NEW or similar asset expressed in current dollar values.

**Cyclic Maintenance**
Replacement of higher value components/sub-components of assets that is undertaken on a regular cycle including repainting, building roof replacement, cycle, replacement of air conditioning equipment, etc. This work generally falls below the capital/maintenance threshold and needs to be identified in a specific maintenance budget allocation.

**Depreciable amount**
The cost of an asset, or other amount substituted for its cost, less its residual value (AASB 116.6)

**Depreciated replacement cost (DRC)**
The current replacement cost (CRC) of an asset less, where applicable, accumulated depreciation calculated on the basis of such cost to reflect the already consumed or expired future economic benefits of the asset

**Depreciation / amortisation**
The systematic allocation of the depreciable amount (service potential) of an asset over its useful life.

**Economic life**
See useful life definition.

**Expenditure**
The spending of money on goods and services. Expenditure includes recurrent and capital.

**Fair value**
The amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties, in an arms length transaction.

**Greenfield asset values**
Asset (re)valuation values based on the cost to initially acquire the asset.

**Heritage asset**
An asset with historic, artistic, scientific, technological, geographical or environmental qualities that is held and maintained principally for its contribution to knowledge and culture and this purpose is central to the objectives of the entity holding it.

**Impairment Loss**
The amount by which the carrying amount of an asset exceeds its recoverable amount.

**Infrastructure assets**
Physical assets of the entity or of another entity that contribute to meeting the public's need for access to major economic and social facilities and services, e.g. roads, drainage, footpaths and cycleways. These are typically large, interconnected networks or portfolios of composite assets. The components of these assets may be separately maintained, renewed or replaced individually so that the required level and standard of service from the network of assets is continuously sustained. Generally the components and hence the assets have long lives. They are fixed in place and are often have no market value.

**Investment property**
Property held to earn rentals or for capital appreciation or both, rather than for:
(a) use in the production or supply of goods or services or for administrative purposes; or
(b) sale in the ordinary course of business (AASB 140.5)

**Level of service**
The defined service quality for a particular service against which service performance may be measured. Service levels usually relate to quality, quantity, reliability, responsiveness, environmental, acceptability and cost).
Life Cycle Cost **
The life cycle cost (LCC) is average cost to provide the service over the longest asset life cycle. It comprises annual maintenance and asset consumption expense, represented by depreciation expense. The Life Cycle Cost does not indicate the funds required to provide the service in a particular year.

Life Cycle Expenditure **
The Life Cycle Expenditure (LCE) is the actual or planned annual maintenance and capital renewal expenditure incurred in providing the service in a particular year. Life Cycle Expenditure may be compared to Life Cycle Expenditure to give an initial indicator of life cycle sustainability.

Loans / borrowings
Loans result in funds being received which are then repaid over a period of time with interest (an additional cost). Their primary benefit is in ‘spreading the burden’ of capital expenditure over time. Although loans enable works to be completed sooner, they are only ultimately cost effective where the capital works funded (generally renewals) result in operating and maintenance cost savings, which are greater than the cost of the loan (interest and charges).

Maintenance and renewal gap
Difference between estimated budgets and projected expenditures for maintenance and renewal of assets, totalled over a defined time (eg 5, 10 and 15 years).

Maintenance and renewal sustainability index
Ratio of estimated budget to projected expenditure for maintenance and renewal of assets over a defined time (eg 5, 10 and 15 years).

Maintenance expenditure
Recurrent expenditure, which is periodically or regularly required as part of the anticipated schedule of works required to ensure that the asset achieves its useful life and provides the required level of service. It is expenditure, which was anticipated in determining the asset’s useful life.

Materiality
An item is material is its omission or misstatement could influence the economic decisions of users taken on the basis of the financial report. Materiality depends on the size and nature of the omission or misstatement judged in the surrounding circumstances.

Modern equivalent asset.
A structure similar to an existing structure and having the equivalent productive capacity, which could be built using modern materials, techniques and design. Replacement cost is the basis used to estimate the cost of constructing a modern equivalent asset.

Non-revenue generating investments
Investments for the provision of goods and services to sustain or improve services to the community that are not expected to generate any savings or revenue to the Council, eg. parks and playgrounds, footpaths, roads and bridges, libraries, etc.

Operating expenditure
Recurrent expenditure, which is continuously required excluding maintenance and depreciation, eg power, fuel, staff, plant equipment, on-costs and overheads.

Pavement management system
A systematic process for measuring and predicting the condition of road pavements and wearing surfaces over time and recommending corrective actions.

Planned Maintenance**
Repair work that is identified and managed through a maintenance management system (MMS). MMS activities include inspection, assessing the condition against failure/breakdown criteria/experience, prioritising scheduling, actioning the work and reporting what was done to develop a maintenance history and improve maintenance and service delivery performance.

PMS Score
A measure of condition of a road segment determined from a Pavement Management System.

Rate of annual asset consumption*
A measure of average annual consumption of assets (AAAC) expressed as a percentage of the depreciable amount (AAAC/DA). Depreciation may be used for AAAC.

Rate of annual asset renewal*
A measure of the rate at which assets are being renewed per annum expressed as a percentage of depreciable amount (capital renewal expenditure/DA).

Rate of annual asset upgrade*
A measure of the rate at which assets are being upgraded and expanded per annum expressed as a percentage of depreciable amount (capital upgrade/expansion expenditure/DA).

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

Recoverable amount
The higher of an asset’s fair value, less costs to sell and its value in use.
Recurrent expenditure
Relatively small (immaterial) expenditure or that which has benefits expected to last less than 12 months. Recurrent expenditure includes operating and maintenance expenditure.

Recurrent funding
Funding to pay for recurrent expenditure.

Rehabilitation
See capital renewal expenditure definition above.

Remaining life
The time remaining until an asset ceases to provide the required service level or economic usefulness. Age plus remaining life is economic life.

Renewal
See capital renewal expenditure definition above.

Residual value
The net amount which an entity expects to obtain for an asset at the end of its useful life after deducting the expected costs of disposal.

Revenue generating investments
Investments for the provision of goods and services to sustain or improve services to the community that are expected to generate some savings or revenue to offset operating costs, eg public halls and theatres, childcare centres, sporting and recreation facilities, tourist information centres, etc.

Risk management
The application of a formal process to the range of possible values relating to key factors associated with a risk in order to determine the resultant ranges of outcomes and their probability of occurrence.

Section or segment
A self-contained part or piece of an infrastructure asset.

Service potential
The capacity to provide goods and services in accordance with the entity's objectives, whether those objectives are the generation of net cash inflows or the provision of goods and services of a particular volume and quantity to the beneficiaries thereof.

Service potential remaining*
A measure of the remaining life of assets expressed as a percentage of economic life. It is also a measure of the percentage of the asset's potential to provide services that is still available for use in providing services (DRC/DA).

Strategic Management Plan (SA)**
Documents Council objectives for a specified period (3-5 yrs), the principle activities to achieve the objectives, the means by which that will be carried out, estimated income and expenditure, measures to assess performance and how rating policy relates to the Council's objectives and activities.

Sub-component
Smaller individual parts that make up a component part.

Useful life
Either:
(a) the period over which an asset is expected to be available for use by an entity, or
(b) the number of production or similar units expected to be obtained from the asset by the entity.

It is estimated or expected time between placing the asset into service and removing it from service, or the estimated period of time over which the future economic benefits embodied in a depreciable asset, are expected to be consumed by the council. It is the same as the economic life.

Value in Use
The present value of estimated future cash flows expected to arise from the continuing use of an asset and from its disposal at the end of its useful life. It is deemed to be depreciated replacement cost (DRC) for those assets whose future economic benefits are not primarily dependent on the asset's ability to generate new cash flows, where if deprived of the asset its future economic benefits would be replaced.

Source: DVC 2006, Glossary
Note: Items shown * modified to use DA instead of CRC
Additional glossary items shown **
1. EXECUTIVE SUMMARY

What Council Provides

Council provides a sewer reticulation network to enable the safe and effective transport of waste water to the sewerage treatment plant.

The reticulation network consists of:
- Approximately 396 km of reticulation pipe
- Approximately 7122 manholes
- 33 pump stations

What does it Cost?

There are two key indicators of cost to provide the sewer reticulation service.
- The life cycle cost being the average cost over the life cycle of the asset, and
- The total maintenance and capital renewal expenditure required to deliver existing service levels in the next 10 years covered by Council’s long term financial plan.

The life cycle cost to provide the sewer reticulation service is estimated at $11.866 million for the financial year 2014/15. Council’s planned life cycle expenditure for year 1 of the asset management plan is $11.479 million which gives a life cycle sustainability index of 0.97.

The total maintenance and capital renewal expenditure required to provide the sewer reticulation service over the next 10 years is estimated at $142.708 million. This is an average of $14.271 per annum.

Council’s maintenance and capital renewal expenditure for year 1 of the asset management plan of $11,478,977 giving a 10 year sustainability index of 0.80.

Plans for the Future

Council plans to operate and maintain the sewer reticulation network to achieve the following strategic objectives.
1. Ensure the sewer reticulation network is maintained at a safe and functional standard as set out in this asset management plan.
2. Ensure that future growth is catered for.

Measuring our Performance

Quality

Sewer reticulation assets will be maintained in a reasonably usable condition. Defects found or reported that are outside our service standard will be repaired. See our maintenance response service levels for details of defect prioritisation and response time.

Function

Our intent is that an appropriate sewer reticulation network is maintained in partnership with other levels of government and stakeholders to ensure public health is upheld and the environment is not compromised.

Key functional objectives are met:
- Safe and efficient transport of waste water
- Maintenance and renewal of the network is within budget

Safety

Regular inspections with defects repaired and prioritised in accordance with our inspection schedule to ensure they are safe.

The Next Steps

This actions resulting from this asset management plan are:
- Improve the collection of physical data pertinent to the maintenance of the sewer reticulation network
- Improve financial data collection
- Provide a formal electronic inspection program with jobs assigned to work gangs and ranked in priority order.
- Improve the Council’s customer request system to more accurately record the nature, extent, severity and location of defects within the sewer reticulation network.
2. INTRODUCTION

2.1 Background

This asset management plan is to demonstrate responsive management of assets (and services provided from assets), compliance with regulatory requirements, and to communicate funding required to provide the required levels of service.

The sewer reticulation system provides a basic and essential service – the collection and transportation of waste water from the source to the waste water treatment works. Due to the implications to public health and the environment the New South Wales Government publishes a number of prescriptive documents requiring strict compliance relating to the sewer system. These include:

- Local Government Act 1993
- Protection of the Environment Operations Act 1997
- Water Management Act 2000
- Catchment Management Authorities Act 2003

Supporting the legislation are a number of guidelines that Council adheres to. These are prepared both by State Government authorities and by the Council. These include:

- AWT 2007 Sewerage system modelling and assessment – final report AWT NZ, Auckland
- Bathurst Regional Council 2004 Guidelines for engineering works, Bathurst Regional Council
- Bathurst Regional Council 1996 Strategic business plan – water supply and sewer services, Bathurst Regional Council
- NSW Department of Water and Energy Code of Practice for Plumbing and Drainage, 2006
- NSW Department of Local Government Consumption Based Pricing for Council Water Supply and Sewerage Services.

A further document was used to prepare this asset management planes valuations and life cycle predictions:

- 2014 NSW Reference Rates Manual for Valuation of Water Supply, Sewerage and Stormwater Assets NSW Department of Primary Industries Office of Water

This Asset Management Plan covers the following infrastructure assets:

Sewer reticulation network – consisting of pump stations, treatment plant, pipes and manholes

**Table 2.1. Assets covered by this Plan**

<table>
<thead>
<tr>
<th>Asset category</th>
<th>Dimension</th>
<th>Replacement Value ($M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reticulation pipe network</td>
<td>311.5 km</td>
<td>80.961</td>
</tr>
<tr>
<td>Trunk main pipe network</td>
<td>65.33 km</td>
<td>38.730</td>
</tr>
<tr>
<td>Rising main pipe network</td>
<td>18.9 km</td>
<td>6.558</td>
</tr>
<tr>
<td>Treatment Plant</td>
<td>1</td>
<td>34.337</td>
</tr>
<tr>
<td>Pump stations and holding tanks</td>
<td>32</td>
<td>9.749</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>$170.336</strong></td>
</tr>
</tbody>
</table>
Key stakeholders in the preparation and implementation of this asset management plan are:

<table>
<thead>
<tr>
<th>The Councillors</th>
<th>Formulate policy for the allocation of resources to maximise benefit to the community whilst minimising the Council’s exposure to risk.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Council</td>
<td>To manage the implementation of policy in a timely and cost effective manner. To ensure resources are effectively utilised</td>
</tr>
<tr>
<td>General Public</td>
<td>End users of the sewer reticulation system.</td>
</tr>
<tr>
<td>Local Businesses</td>
<td>Many local business discharge to sewer and are required to have trade waste agreements in place with the Council</td>
</tr>
</tbody>
</table>

### 2.2 Goals and Objectives of Asset Management

The Council exists to provide services to the community. Some of these services are provided by infrastructure assets. Council has acquired infrastructure assets by ‘purchase’, by contract, construction by council staff and by donation of assets constructed by developers and others to meet increased levels of service.

Council’s goal in managing infrastructure assets is to meet the required level of service in the most cost effective manner for present and future consumers. The key elements of infrastructure asset management are:

- Taking a life cycle approach,
- Developing cost-effective management strategies for the long term,
- Providing a defined level of service and monitoring performance,
- Understanding and meeting the demands of growth through demand management and infrastructure investment,
- Managing risks associated with asset failures,
- Sustainable use of physical resources,
- Continuous improvement in asset management practices.

This asset management plan is prepared under the direction of Council’s vision, mission, goals and objectives.

Council’s vision:

“To enhance the lifestyle and environment through effective leadership, community involvement and commitment to service.”

Council’s mission:

“The equitable development and maintenance of services provided for the general health and well-being of the citizens of the Bathurst Region and the adjustment of these services to meet changing needs.”
Relevant Council goals and objectives and how these are addressed in this asset management plan are:

**Table 2.2. Council Goals and how these are addressed in this Plan**

<table>
<thead>
<tr>
<th>Goal</th>
<th>Objective</th>
<th>How Goal and Objectives are addressed in IAMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>To provide a safe, reliable and cost effective sewerage service.</td>
<td>To meet the needs of residential, commercial and industrial clients and catters for the economic growth of the area.</td>
<td>Compliance with implementing programs for compliance with the Office of Water Best Practice Guidelines</td>
</tr>
<tr>
<td>Adequate infrastructure for projected population 80,000 by 2050</td>
<td>To have in place quality infrastructure that meets the needs of the community by providing adequate facilities for a population of 80,000 by the year 2050.</td>
<td>All newly developed lots within the urban area of Bathurst are provided with a sewer connection and connected to a reticulation network to council’s standard.</td>
</tr>
<tr>
<td>To create a progressive economic environment that facilitates job creation and is responsive to changing demands.</td>
<td>Ensure adequate sewer infrastructure is in place to provide for future economic development of the Bathurst City area.</td>
<td>Sewer system has been computer modelled to ensure the capacity is adequate for businesses and industries that may, in the future locate in Bathurst.</td>
</tr>
</tbody>
</table>

The key issues of the sewer reticulation asset management plan are
- Deterioration of network
- Potential pollution of environment
- Loss of amenity
- Regulatory control
- Community concern

### 2.3 Plan Framework

Key elements of the plan are
- Levels of service – specifies the services and levels of service to be provided by council.
- Future demand – how this will impact on future service delivery and how this is to be met.
- Life cycle management – how Council will manage its existing and future assets to provide the required services.
- Financial summary – what funds are required to provide the required services.
- Asset management practices
- Monitoring – how the plan will be monitored to ensure it is meeting Council's objectives.
- Asset management improvement plan

A road map for preparing an asset management plan is shown over.
2.4 Core and Advanced Asset Management

This asset management plan is prepared as a ‘core’ asset management plan in accordance with the International Infrastructure Management Manual. It is prepared to meet minimum legislative and organisational requirements for sustainable service delivery and long term financial planning and reporting. Core asset management is a ‘top down’ approach where analysis is applied at the ‘system’ or ‘network’ level.

Future revisions of this asset management plan will move towards ‘advanced’ asset management using a ‘bottom up’ approach for gathering asset information for individual assets to support the optimisation of activities and programs to meet agreed service levels.
3. LEVELS OF SERVICE

3.1 Customer Research and Expectations

The function of the sewer reticulation system is collection and transport of waste water to the Bathurst sewerage treatment works. Due to the basic functional nature of the sewer reticulation system, customer expectations at a high level are simple. In most instances an attitude of ‘flush and forget’ is as far as expectations go.

Occurrences of sewer chokes and problems with odours account for all residential customer requests and complaints relating to the sewer reticulation system.

Some commercial and industrial customers require a specific level of capacity from the reticulation network to manage the amount and nature of the trade waste being discharged. An example is the Kelso industrial park network of collection mains and the pump station. These requirements are generally managed through Council’s trade waste policy.

The Council does not intend to carry out any specific customer research into the sewer services it supplies.

*Fig 3.1. Customer Requests from Sewer Department*

Figure 3.1 shows the number of requests per month from Jan 2009 to Dec 2014. The trend line indicates the number of requests is decreasing each year.
3.2 Legislative Requirements

Council has to meet many legislative requirements including Australian and State legislation and State regulations. The primary acts and regulations relating to the sewer reticulation system are:

*Table 3.2. Legislative Requirements*

<table>
<thead>
<tr>
<th>Legislation</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Government Act</td>
<td>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.</td>
</tr>
<tr>
<td>Water Management Act</td>
<td>Legislates the sustainable and integrated management of water resources for NSW</td>
</tr>
<tr>
<td>Public Health Act 1991</td>
<td></td>
</tr>
<tr>
<td>Environmental Planning and Assessment Act 1979</td>
<td>The principal planning instrument in NSW – specifies environmental considerations required for all development activities.</td>
</tr>
<tr>
<td>Catchment Management Act 2003</td>
<td>Seeks to co-ordinate policies, programs and activities within a catchment area that have an effect on the environment</td>
</tr>
<tr>
<td>Environmental Protection Licence</td>
<td>Dictates the levels of pollutants that the waste water treatment works may discharge to the Macquarie River</td>
</tr>
<tr>
<td>Civil Liabilities Act 2002</td>
<td>Sets out the provisions that give protection from civil liability and the responsibilities of Council and public alike.</td>
</tr>
<tr>
<td>Protection of the Environment Act 1997</td>
<td>To protect, restore and enhance the quality of the environment having regard to the need to maintain ecologically sustainable development.</td>
</tr>
</tbody>
</table>
3.3 **Current Levels of Service**

Service levels can be defined by two terms.

Community Levels of Service relate to how the community receives the service in terms of safety, quality, quantity, reliability, responsiveness, cost/efficiency and legislative compliance.

Supporting the community service levels are operational or technical measures of performance developed to ensure that the minimum community levels of service are met. These technical measures relate to service criteria such as:

<table>
<thead>
<tr>
<th>Service Criteria</th>
<th>Technical measures may relate to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality</td>
<td>The reliability of the sewer service (number of chokes recorded). Odour complaints.</td>
</tr>
<tr>
<td>Quantity</td>
<td>The catchment area for collection service (replacing septic systems)</td>
</tr>
<tr>
<td>Availability</td>
<td>Capacity of the sewer reticulation system to cope with the full system load (diurnal pattern). Ensuring ‘self cleansing’ flow is maintained.</td>
</tr>
<tr>
<td>Safety</td>
<td>Frequency of surcharging</td>
</tr>
</tbody>
</table>
## Table 3.3. Current Service Levels

<table>
<thead>
<tr>
<th>Key Performance Measure</th>
<th>Level of Service</th>
<th>Performance Measure Process</th>
<th>Performance Target</th>
<th>Current Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Community Levels of Service</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality</td>
<td>Sewer service is sufficient and adequately maintained for residential customers</td>
<td>Number of residential complaints relating to sewer service</td>
<td>&lt;400 pa</td>
<td>375 (2014)</td>
</tr>
<tr>
<td></td>
<td>Sewer service does not contribute to air pollution</td>
<td>Number of complaints relating to odour emissions</td>
<td>&lt;2 pa</td>
<td>6 (2014)</td>
</tr>
<tr>
<td>Safety</td>
<td>Sewer reticulation is isolated from ground</td>
<td>Reported cases sewer surcharges in 12 months</td>
<td>&lt; 175 pa</td>
<td>182 (2014)</td>
</tr>
<tr>
<td></td>
<td>Sewer chokes are cleared quickly</td>
<td>Reported cases of sewer blockages in 12 months</td>
<td>&lt; 125 pa</td>
<td>132 (2014)</td>
</tr>
<tr>
<td><strong>Technical Level of Service</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Availability</td>
<td>Connections for domestic sewerage are provided to all allotments within a designated area</td>
<td>Number of lots not connected to the sewerage system within the serviced areas</td>
<td>100%</td>
<td>&lt;100%</td>
</tr>
<tr>
<td></td>
<td>Acceptance of commercial and industrial waste is in accordance with Council’s trade waste policy</td>
<td>Local business and industry is able to effectively carry out their operations whilst complying with the trade waste policy</td>
<td>100% compliance</td>
<td>&lt;100%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Council has an inspection regime to ensure compliance</td>
</tr>
<tr>
<td>Dry Weather Leakage ratio</td>
<td>Keep the sewer network as water tight as possible to reduce the amount of water leaking into and out of the pipes</td>
<td>A measure of the leakiness of the pipes in the sewer network thus allowing water to infiltrate or exfiltrate from the network</td>
<td>Greater than 45% of network in &quot;Satisfactory&quot; condition and less than 20% in &quot;Poor&quot; condition</td>
<td>45% Satisfactory 38% Poor 17% Very Poor See Appendix X</td>
</tr>
<tr>
<td>Camera, Clean and Condition Rate Sewer Network</td>
<td>Have a rigorous pro-active programme of pipe defect maintenance to prevent major blockages and breakages</td>
<td>Have areas of older construction and areas of known problems cameraed and cleaned each year for planned relining in future</td>
<td>To camera and clean at least 2 km of the sewer network each year.</td>
<td>5.2 km (2014)</td>
</tr>
<tr>
<td>Relining Programme</td>
<td>Relining the inner wall of pipes to extend their life by 50 years and return their condition to new pipe condition</td>
<td>All existing defects are removed and pipes are in &quot;excellent&quot; condition. The older parts of the network are kept in good operating condition.</td>
<td>2000 m relined each year</td>
<td>Enter 2023 m relined 2014</td>
</tr>
</tbody>
</table>
4. FUTURE DEMAND

4.1 Demand Forecast

The primary factor affecting demand on the sewer reticulation system is population change. The Bathurst Region growth rate at the last census (2014) was 1.6%. The annual average growth rate for the area has been 1.3% since 2004, peaking at 2.49% in the 2009 period\(^2\).

Other factors that may affect the demands include widening the catchment area for the reticulation system to include the village of Georges Plains and the effects of predicted climate change and the changing of the seasonal rainfall patterns.

Table 4.1. Demand Factors, Projections and Impact on Services

<table>
<thead>
<tr>
<th>Demand factor</th>
<th>Present position</th>
<th>Projection</th>
<th>Impact on services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand for sewer connections</td>
<td>A feasibility study is being undertaken to assess the viability of connecting the village of Georges Plains to the sewer network</td>
<td>Increasing connections means increasing network length. The outlying areas require more infrastructure including pumps stations and holding tanks</td>
<td></td>
</tr>
<tr>
<td>Climate Change</td>
<td>Predicted decline in overall rainfall with an increase in severe rainfall events</td>
<td>Increased peak demand on the reticulation system during severe rainfall events.</td>
<td></td>
</tr>
<tr>
<td>Trade waste discharging</td>
<td>Council’s trade waste policy</td>
<td>Increasing onus on discharging business to pre-treat waste reducing the load on the system.</td>
<td></td>
</tr>
<tr>
<td>Environmental Standards</td>
<td>The NSW Environmental Protection Authority through the discharge licensing system dictates the allowable discharge from the sewage treatment plant.</td>
<td>As new legislation demands council is required to ensure that all waste water transport is compliant with the relevant sections of the Government acts</td>
<td></td>
</tr>
</tbody>
</table>

4.2 Changes in Technology

Waste water technological change is reflecting the greater value being placed on water resources in recent times. Grey water treatment systems are being developed that are applicable to small residential blocks. Council has implemented assessment procedures in accordance with the NSW Department of Primary Industries, Office of Water.

There has also been an increase in the water efficiency of many domestic appliances including shower heads, washing machines and dishwashers. These factors, along with the increased awareness of water issues have reduced the flow into the system, which can itself cause problems with minimum flow requirements to ensure the efficient movement of waste water through the system.

Material technology is constantly developing and improving. Examples of past developments include uPVC piping and innovative pipe relining techniques.

\(^2\) Australian Bureau of Statistics, Regional Population Growth, Australia (3218.0). Compiled and presented in profile.id by .id The population experts
Table 4.2. Changes in Technology and Forecast effect on Service Delivery

<table>
<thead>
<tr>
<th>Technology Change</th>
<th>Effect on Service Delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water efficient appliances</td>
<td>As new technology becomes available, domestic and commercial appliances are using water more efficiently. This reduces the load placed on the sewer system. It may reduce the flow to below the critical level for self cleansing flow. Sewer design may need to be reassessed for managing low flow.</td>
</tr>
<tr>
<td>Grey water re-use</td>
<td>Awareness of water conservation issues has led to an increase in the installation of grey water systems. The installation is tightly regulated by Council to ensure safe and effective installations.</td>
</tr>
<tr>
<td>Improvements in maintenance techniques</td>
<td>The continuing development of in-situ pipe renewal systems and advancements in pipe cleaning methods. These new technologies reduce the cost of renewing pipes at the end of their useful life.</td>
</tr>
</tbody>
</table>

4.3 Demand Management Plan

Due to the public health and environmental implications of the sewer reticulation system being compromised, demand management is aimed primarily at managing the load on the system in terms of quantity and content, rather than lowering the level of service standards and the acceptance of a greater number of service failures.

Load reduction is a consequence of a reduction in water consumption. During periods of low rainfall, a low flow through the sewer can be undesirable as a minimum flow is required to ensure that flow is self cleansing and waste is transported effectively to the filtration plant.

Opportunities identified to date for demand management are shown in Table 4.3. Further opportunities will be developed in future revisions of this asset management plan.

Table 4.3. Demand Management Plan Summary

<table>
<thead>
<tr>
<th>Service Activity</th>
<th>Demand Management Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Septic tank systems</td>
<td>Council are commissioning a study into the viability of providing sewer services to the village of Georges Plains. The outcome of the study may be to retain the status quo.</td>
</tr>
<tr>
<td>Trade waste discharging</td>
<td>Implementation of the NSW Department of Water and Energy trade waste guidelines as Council Policy that dictates discharge limits and volumes and the instrument for issuing fines</td>
</tr>
<tr>
<td>Low flow (less than self cleansing flow)</td>
<td>A sewer flushing program may need implementing if the load on a particular section of the system is insufficient to maintain self cleansing flow</td>
</tr>
</tbody>
</table>
4.4 New Assets from Growth

The new assets required to meet growth will be acquired from land developments and constructed by Council. The new asset values are summarised in Fig 1.

**Fig 1. New Assets from Growth**

[Bar chart showing the growth in sewer pipe length over years]

- Blue: Sewer reticulation network – based on previous 5 years growth (of sewer network)
- Green: Sewer reticulation network – based on predicted population growth rates

Acquiring these new assets will commit council to fund ongoing operations and maintenance 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 operating and maintenance costs.
5. LIFECYCLE MANAGEMENT PLAN

The lifecycle management plan details how Council plans to manage and operate the assets at the agreed levels of service (defined in section 3) while optimising life cycle costs.

5.1 Background Data

5.1.1 Physical parameters

*Table 5.1a – pipe network*

<table>
<thead>
<tr>
<th>Pipe Type</th>
<th>Sewer reticulation</th>
<th>Sewer rising main</th>
<th>Sewer Trunk main</th>
<th>Total (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitreous clay</td>
<td>261,259</td>
<td>44</td>
<td>25,309</td>
<td>286,612</td>
</tr>
<tr>
<td>Plastic</td>
<td>48,026</td>
<td>7,896</td>
<td>2,960</td>
<td>58,882</td>
</tr>
<tr>
<td>Re-enforced concrete</td>
<td>934</td>
<td>786</td>
<td>29,602</td>
<td>31,322</td>
</tr>
<tr>
<td>Asbestos cement</td>
<td>0</td>
<td>6,740</td>
<td>3,598</td>
<td>10,338</td>
</tr>
<tr>
<td>Steel / iron</td>
<td>1,049</td>
<td>303</td>
<td>728</td>
<td>2,081</td>
</tr>
<tr>
<td>Total</td>
<td>311,269</td>
<td>15,770</td>
<td>62,197</td>
<td>389,236</td>
</tr>
</tbody>
</table>

*Table 5.1b – other infrastructure*

<table>
<thead>
<tr>
<th>Asset</th>
<th>Asset Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump stations</td>
<td>34</td>
</tr>
<tr>
<td>Manholes</td>
<td>7122</td>
</tr>
</tbody>
</table>

Notes on system age and reliability

The network of sewer reticulation pipes dates back to 1912 when the original sewer system installation began. A number of the original pipes are still functional units within the system. The modern network is a mixture of both original and modern vitreous clay pipes and asbestos cement pipes and more modern ductile iron (often lined with concrete) and new plastic type pipes. Record keeping has been patchy over the last 95 years, and accordingly it is not possible to locate all the very old pipes. New reticulation pipes laid for new subdivisions and developments are generally uPVC pipe as per the Engineering guidelines. Larger carrier mains are constructed of reinforced concrete. On occasions pipes suffer root damage severe enough to cause the pipe to collapse. In these cases, the pipe will be replaced with a modern equivalent.

Council has no reliable way of predicting breakages and chokes in the network, however the Council is currently mapping sewer chokes in an attempt to identify areas of possibly compromised pipe network. These areas are then investigated further with CCTV cameras and a condition rating is applied to each section of pipe. The worst sections are then highlighted for relining to return them to a new condition.

The reticulation system is subject to inflow and infiltration (I/I) during rainfall events. Inflow is flow through incorrectly connected stormwater drains. Infiltration is flow into the system through leaking joints, low lying manholes and permeable pipes (such as vitreous clay). This flow at its peak along with the usual waste water flow is termed peak wet weather flow.

The 2013 Report from AWT, shows that ST06 and ST07 catchments (see appendix A) have a wet weather I/I rate of over 5%. It is further recommended that these catchments are now suitable for rehabilitation and should be the focus of any I/I detection programme (CCTV and relining and renewal).
Fig 2. – Reticulation pipe network age profile

NOTE
- Approximately 8% of the network age has been estimated by using the date of registration of deposited plans. This is generally applies to pipes installed earlier than 1960.
Table 5.1.c Pump station age profile

<table>
<thead>
<tr>
<th>Reservoir</th>
<th>Suburb</th>
<th>Year of Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump Station No.1, Charlotte Street – Showground</td>
<td>Bathurst</td>
<td>1962</td>
</tr>
<tr>
<td>Pump Station No.2, Gilmour Street, Kelso</td>
<td>Kelso</td>
<td>1979</td>
</tr>
<tr>
<td>Pump Station No.3, Ranken Street, Eglinton</td>
<td>Eglinton</td>
<td>1984</td>
</tr>
<tr>
<td>Pump Station No.4, All Saints - Eglinton Road, Abercrombie</td>
<td>Abercrombie</td>
<td>1984</td>
</tr>
<tr>
<td>Pump Station No.5, Kirkaldy Street, South Bathurst</td>
<td>South Bathurst</td>
<td>1980</td>
</tr>
<tr>
<td>Pump Station No.6, Cardiff Place, Kelso</td>
<td>Kelso</td>
<td>2006</td>
</tr>
<tr>
<td>Pump Station No.8, McPhilamy Park Toilet and Shower block</td>
<td>Mount Panorama</td>
<td>1977</td>
</tr>
<tr>
<td>Pump Station No.9, Vale Road, Adjacent to Ormya. Orton Park</td>
<td>Orton Park</td>
<td>1993</td>
</tr>
<tr>
<td>Pump Station No.10, Queen Street, Periville</td>
<td>Periville</td>
<td>1993</td>
</tr>
<tr>
<td>Pump Station No.11, 9 Bridge Street, Periville</td>
<td>Periville</td>
<td>1993</td>
</tr>
<tr>
<td>Pump Station No.12, Vale Road, Periville</td>
<td>Periville</td>
<td>1993</td>
</tr>
<tr>
<td>Pump Station No.13, Reid Park Toilet block</td>
<td>Mount Panorama</td>
<td>1993</td>
</tr>
<tr>
<td>Pump Station No.14, Pine View Estate</td>
<td>Kelso</td>
<td>1995</td>
</tr>
<tr>
<td>Pump Station No.15, Sulman Park Toilet block</td>
<td>Mount Panorama</td>
<td>1999</td>
</tr>
<tr>
<td>Pump Station No.16, Blueridge Estate - White Rock Road</td>
<td>White Rock</td>
<td>2002</td>
</tr>
<tr>
<td>Pump Station No.17, Blueridge Estate – Ridgeview Close</td>
<td>White Rock</td>
<td>2008</td>
</tr>
<tr>
<td>Pump Station No.18, Waste Management Centre Leachate pit</td>
<td>Mount Panorama</td>
<td>2004</td>
</tr>
<tr>
<td>Pump Station No.19, Ben Chifley Dam - Aquatic Site Cottages</td>
<td>Lagoon</td>
<td>2005</td>
</tr>
<tr>
<td>Pump Station No.20, Ben Chifley Dam - Headland Site</td>
<td>Lagoon</td>
<td>2005</td>
</tr>
<tr>
<td>Pump Station No.21, Sulman Park Shower block</td>
<td>Mount Panorama</td>
<td>2008</td>
</tr>
<tr>
<td>Pump Station No.22, Leemonth Park Hockey</td>
<td>Kelso</td>
<td>2008</td>
</tr>
<tr>
<td>Pump Station No.23, Ben Chifley Dam - Aquatic Site Toilet</td>
<td>Lagoon</td>
<td>2009</td>
</tr>
<tr>
<td>Pump Station No.24, Waste Management Centre Weigh bridge</td>
<td>Mount Panorama</td>
<td>2009</td>
</tr>
<tr>
<td>Pump Station No.25, Rugby Complex - Ashwood Park, Hereford Street</td>
<td>Kelso</td>
<td>2010</td>
</tr>
<tr>
<td>Pump Station No.26, Waste Management Centre, near office</td>
<td>Mount Panorama</td>
<td>2014</td>
</tr>
<tr>
<td>Pump Station No.30, Berry Park</td>
<td>Kelso</td>
<td>2012</td>
</tr>
<tr>
<td>Pump Station No.31, Forest Elbow</td>
<td>Mount Panorama</td>
<td>2012</td>
</tr>
<tr>
<td>Pump Station No.32, Proctor Park</td>
<td>Gormans Hill</td>
<td>2012</td>
</tr>
<tr>
<td>Pump Station No.33, Chifley Dam - Headland (near boat ramp) public amenities</td>
<td>The Lagoon</td>
<td>2013</td>
</tr>
<tr>
<td>Pump Station No.34, Reid Park (near Camp Cullen)</td>
<td>Mount Panorama</td>
<td>2013</td>
</tr>
<tr>
<td>Pump Station No.35, Water Filtration Plant</td>
<td>Gormans Hill</td>
<td>2013</td>
</tr>
<tr>
<td>Pump Station No.36, Ophir Road, Riverview Estate</td>
<td>Abercrombie</td>
<td>2013</td>
</tr>
<tr>
<td>Pump Station No.37, Icely Street</td>
<td>Eglinton</td>
<td>2015</td>
</tr>
</tbody>
</table>

5.1.2 Asset capacity and performance

Council’s services 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. Known Service Performance Deficiencies

<table>
<thead>
<tr>
<th>Location</th>
<th>Service Deficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Durham Street</td>
<td>Insufficient fall from the house to the sewer main for gravity feed into the sewer system. A number of houses are connected to a septic system.</td>
</tr>
<tr>
<td>Morrisett Street area</td>
<td>Insufficient fall from the house to the sewer main for gravity feed into the sewer system. A number of houses are connected to a pump out sewer system.</td>
</tr>
<tr>
<td>Numerous locations around Bathurst</td>
<td>A number of trunk main locations have been identified through AWT modelling that during under certain conditions have inadequate capacity and as a result surcharging from adjacent manholes may occur.</td>
</tr>
</tbody>
</table>

5.1.3 Asset condition
The condition profile of the sub-surface parts of the sewer network is difficult to ascertain. In lieu of condition information the age of the pipe network (see Figure 1) will be used to estimate the condition. Council does have some condition data on the older parts of the network, however this is only a small sample and is not representative of the entire network.

Condition is measured using a 1 – 5 rating system.

<table>
<thead>
<tr>
<th>Rating</th>
<th>Description of Condition</th>
<th>Age Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Excellent condition: Only planned maintenance required.</td>
<td>&lt;10 yrs old</td>
</tr>
<tr>
<td>2.</td>
<td>Good: Minor maintenance required &amp; planned maintenance.</td>
<td>10 – 30 yrs old</td>
</tr>
<tr>
<td>3.</td>
<td>Average: Significant maintenance required.</td>
<td>30 – 60 yrs old</td>
</tr>
<tr>
<td>4.</td>
<td>Poor: Significant renewal/upgrade required.</td>
<td>60 – 80 yrs old</td>
</tr>
<tr>
<td>5.</td>
<td>Bad: Unserviceable.</td>
<td>&gt;80 yrs old</td>
</tr>
</tbody>
</table>

Average age of network components is 36 years

5.1.4 Asset valuations

The value of assets as at 30 June 2014 covered by this asset management plan is summarised below. Assets are valued at greenfield rates.

- Current Replacement Cost: $170.336 million
- Depreciable Amount: $170.336 million (assume no residual value)
- Depreciated Replacement Cost: $83.952 million
- Annual Depreciation Expense: $2.244 million

Sustainability reporting reports the rate of annual asset consumption and compares this to asset renewal and asset upgrade and expansion.

- Asset Consumption: 1.25%
- Asset renewal: 0.34%
- Annual Upgrade/expansion: < 0.10%
5.2 Risk Management Plan

An assessment of risks associated with service delivery from infrastructure assets has identified critical risks to Council. 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.

Critical risks, being those assessed as ‘Very High’ - requiring immediate corrective action and ‘High’ – requiring prioritised corrective action identified in the infrastructure risk management plan are summarised in Table 5.2.

Table 5.2. Critical Risks and Treatment Plans

<table>
<thead>
<tr>
<th>Risk</th>
<th>What can Happen</th>
<th>Risk Rating (VH, H)</th>
<th>Risk Treatment Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pumping station</td>
<td>Power/electrical or mechanical failure</td>
<td>VH</td>
<td>Installation of holding tanks for offline storage of waste water until such time as the pump station is operational. Minimum 8 hours holding capacity</td>
</tr>
<tr>
<td>Trunk main choke</td>
<td>Through a combination of a build up of solids and low flow a sewer choke can occur in larger diameter mains</td>
<td>VH</td>
<td>The AWT modelling has identified areas around town where pipe capacities may be inadequate. Council are implementing the recommendations as budgeting allows.</td>
</tr>
<tr>
<td>Environment and public health</td>
<td>Discharge from manhole in low sensitivity area such as industrial area</td>
<td>H</td>
<td>Council has a 24 hour emergency line to ensure any surcharge is dealt with quickly and efficiently.</td>
</tr>
<tr>
<td>Environment and public health</td>
<td>Discharge from manhole is in a public or environmentally sensitive area</td>
<td>VH</td>
<td>Council has a 24 hour emergency line to ensure any surcharge is dealt with quickly and efficiently.</td>
</tr>
</tbody>
</table>
5.3 Routine Maintenance Plan

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.

5.3.1 Maintenance plan

Maintenance includes reactive, planned and cyclic maintenance work activities.

Reactive maintenance is unplanned repair work carried out in response to service requests and management/supervisory directions. Reactive maintenance to the sewer reticulation network includes:

- Clearing sewer chokes.
- Repairing or replacing broken pipes.
- Replacing damaged manhole lids.
- Making necessary repairs to failed pump stations

Planned maintenance is repair work that is identified and managed through a maintenance management system (MMS). MMS activities include inspection, assessing the condition against failure/breakdown experience, prioritising, scheduling, actioning the work and reporting what was done to develop a maintenance history and improve maintenance and service delivery performance. Planned maintenance on the sewer reticulation system includes:

- Relining of mains in poor condition.
- Regular cleaning of sections of the reticulation network known to have problems.
- Using pipe cameras to assess areas of the network suspected of poor condition.

Cyclic maintenance is replacement of higher value components/sub-components of assets that is undertaken on a regular cycle including repainting, building roof replacement, etc. This work generally falls below the capital/maintenance threshold. Cyclic maintenance on the reticulation network is mainly performed on the pump stations through implementing the pump station asset maintenance plan. This includes:

- Servicing of pumps and motors to manufacturers recommendations.
- Replacing electrical components with finite life spans.

Maintenance expenditure trends are shown in Table 5.3.1

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment Maintenance Costs</td>
<td>$565,300</td>
<td>$580,327</td>
<td>$595,801</td>
<td>$611,737</td>
<td>$628,151</td>
</tr>
<tr>
<td>Pumping Station Maintenance</td>
<td>$57,296</td>
<td>$45,911</td>
<td>$47,198</td>
<td>$48,526</td>
<td>$49,896</td>
</tr>
<tr>
<td>Mains Maintenance</td>
<td>$632,800</td>
<td>$651,070</td>
<td>$669,947</td>
<td>$689,452</td>
<td>$709,611</td>
</tr>
<tr>
<td>Sewer Network Maintenance &amp; Compliance</td>
<td>$166,000</td>
<td>$169,818</td>
<td>$173,724</td>
<td>$177,719</td>
<td>$181,807</td>
</tr>
<tr>
<td>Pump Stn Maintenance</td>
<td>$150,800</td>
<td>$113,157</td>
<td>$115,760</td>
<td>$118,422</td>
<td>$121,146</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$1,572,196</td>
<td>$1,560,283</td>
<td>$1,602,430</td>
<td>$1,645,856</td>
<td>$1,690,611</td>
</tr>
</tbody>
</table>

Maintenance expenditure levels are considered to be adequate.

Assessment and prioritisation of reactive maintenance is undertaken by Council staff using experience and judgement.
5.3.2 Standards and specifications

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

- Bathurst Regional Council 2004 *Guidelines for engineering works*, Bathurst Regional Council, 2004
- Australian Builders Code Board, Plumbing Code of Australia (PCA)

5.3.3 Summary of future maintenance expenditures

Future maintenance expenditure is forecast to trend in line with the value of the asset stock as shown in Fig 4. Note that all costs are shown in current 2015 dollar values.

*Fig 4. Planned Maintenance Expenditure*

![Graph showing planned maintenance expenditure over time]

**NOTE**

- Assumed CPI of 2.4% p.a.
- Budget forecasting is reviewed annually and adjusted for CPI variations.

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

Maintenance is funded from Council’s operating budget and grants where available. This is further discussed in Section 6.2.

5.4 Renewal/Replacement Plan

Renewal 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.
5.4.1 Renewal plan

Sewer pipes requiring renewal are identified from estimates of remaining life obtained from the asset register and from recommendation made by Councils waste water technicians. Candidate proposals are inspected by remote camera to verify pipe condition and to develop a preliminary renewal estimate. Suspect pipes are inspected and cleaned with a camera and a condition rating applied. Available funds are scheduled in future works programmes.

Modern pipe renewal techniques are generally in-situ relining of the pipe wall using one of a number of proprietary methods. Relining restores the service potential of the pipe at a cost significantly less than replacement. Where a pipe can not be renewed via relining it is necessary to dig it up and replace the damaged or aged section.

5.4.2 Renewal standards

Renewal work is carried out in accordance with the Australian Builders Code Board, Plumbing Code of Australia (PCA). Further to this, all work is inspected by remote camera before and after relining. The end product is to be to the satisfaction of the operations manager of the wastewater system.

5.4.3 Summary of future renewal expenditure

Projected future renewal expenditures are forecast to increase over time as the asset stock ages. The costs are summarised in Fig 5. Note that all costs are shown in current 2015 dollar values.
Deferred renewal, i.e. those assets identified for renewal and not scheduled for renewal in capital works programs are to be included in the risk assessment process in the risk management plan.

Renewals are to be funded from Council’s capital works program and grants where available. This is further discussed in Section 6.2.

5.5 Creation/Acquisition/Upgrade Plan

New works are those works that 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 to the Council from land development. These assets from growth are considered in Section 4.4.

5.5.1 Selection criteria

New sewer reticulation assets are constructed as new growth dictates. Reticulation system assets include pipes, manholes and pump stations where required.

Necessary upgrades of pipes are identified through a comprehensive process of modelling the sewer system. A number of candidate areas for upgrade of pipes have been identified in the AWT NZ modelling and assessment of the Bathurst sewer system. These are identified as areas with insufficient capacity to avoid surcharging during wet weather events and areas of high growth. Further to the suggested pipe upgrades is the recommendation to provide adequate offline storage for a minimum of 8 hours at 6 of the 33 pump stations within the collection area. See appendix A for a summary on upgrade work required for 5 year ARI containment as recommended by AWT as the best option.

AWT has used the SEWer Cost Optimization Model (SEWCOM) to develop sustainable low cost options to upgrade the reticulation system to overcome overflow problems for a given ARI. The options identified are:

- System amplification (or duplication)
- Inflow/infiltration (I/I) reduction
- Inline/offline storage
5.5.2 Standards and specifications

Standards and specifications for new assets and for upgrade/expansion of existing assets are the same as those for renewal shown in Section 5.4.2.

5.5.3 Summary of future upgrade/new assets expenditure

Planned upgrade/new asset expenditures are summarised in Fig 6. All costs are shown in current 2015 dollar values.

**Fig 6. Planned Capital Upgrade/New Asset Expenditure**

![Planned Capital Upgrade/New Asset Expenditure](image)

**NOTE**
- The projected planned expenditure is based on the average expenditure for 2013 to 2015.
- Budget forecasting is reviewed annually and adjusted for CPI variations.

New assets and services are funded from Council’s capital works program and grants where available. This is further discussed in Section 6.2.

5.6 Disposal Plan

The sewer network is not subject to disposal.
6. **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.

6.1 **Financial Statements and Projections**

The financial projections are shown in Fig 7 for planned operating (operations and maintenance) and capital expenditure (renewal and upgrade/expansion/new assets).

*Fig 7. Planned Operating and Capital Expenditure*

![Planned Operating and Capital Expenditure](chart.jpg)

**NOTE**

- Budget forecasting is reviewed annually and adjusted for CPI variations.
- Note that all costs are shown in current 2015 dollar values.
6.1.1 Sustainability of service delivery

There are two key indicators for financial sustainability that have been considered in the analysis of the services provided by this asset category, these being long term life cycle costs and medium term costs over the 10 year financial planning period.

Long term - Life Cycle Cost

Life cycle costs (or whole of life costs) are the average costs that are required to sustain the service levels over the longest asset life. Life cycle costs include maintenance and asset consumption (depreciation expense). The annual average life cycle cost for the services covered in this asset management plan is $11.866 million.

Life cycle costs can be compared to life cycle expenditure to give an indicator of sustainability in service provision. Life cycle expenditure includes maintenance plus capital renewal expenditure. Life cycle expenditure will vary depending on the timing of asset renewals. The life cycle expenditure at the start of the plan is $11.479 million.

A gap between life cycle costs and life cycle expenditure gives an indication as to whether present consumers are paying their share of the assets they are consuming each year. The purpose of this asset management plan is to identify levels of service that the community needs and can afford and develop the necessary long term financial plans to provide the service in a sustainable manner.

The life cycle gap for services covered by this asset management plan is $378,000 per annum. The life cycle sustainability index is 0.97. The low life cycle sustainability index shows that the sewer network is adequately being funded.

Medium term – 10 year financial planning period

This asset management plan identifies the estimated maintenance and capital expenditures required to provide an agreed level of service to the community over a 20 year period for input into a 10 year financial plan and funding plan to provide the service in a sustainable manner. This may be compared to existing or planned expenditures in the 20 year period to identify any gap.

Fig 8 shows the projected asset renewals in the 20 year planning period from the asset register. The projected asset renewals are compared to planned renewal expenditure in the capital works program and capital renewal expenditure in year 1 of the planning period as shown in Fig 8. Table 6.1.1 shows the annual and cumulative funding gap between projected and planned renewals.
NOTE
- Budget forecasting is reviewed annually and adjusted for CPI variations.
- Note that all costs are shown in current 2015 dollar values.
- CPI assumed rate of 2.4% used.

Table 6.1.1 Projected and Planned Renewals and Expenditure Gap

<table>
<thead>
<tr>
<th>Year</th>
<th>Planned Renewals</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014/15</td>
<td>$1,514,480</td>
</tr>
<tr>
<td>2015/16</td>
<td>$1,130,959</td>
</tr>
<tr>
<td>2016/17</td>
<td>$1,158,088</td>
</tr>
<tr>
<td>2017/18</td>
<td>$1,185,905</td>
</tr>
<tr>
<td>2018/19</td>
<td>$1,214,327</td>
</tr>
<tr>
<td>2019/20</td>
<td>$1,243,470</td>
</tr>
<tr>
<td>2020/21</td>
<td>$1,273,314</td>
</tr>
<tr>
<td>2021/22</td>
<td>$1,303,873</td>
</tr>
<tr>
<td>2022/23</td>
<td>$1,335,166</td>
</tr>
<tr>
<td>2023/24</td>
<td>$1,367,210</td>
</tr>
<tr>
<td>2024/25</td>
<td>$1,400,023</td>
</tr>
<tr>
<td>2025/26</td>
<td>$1,433,624</td>
</tr>
<tr>
<td>2026/27</td>
<td>$1,468,031</td>
</tr>
<tr>
<td>2027/28</td>
<td>$1,503,264</td>
</tr>
<tr>
<td>2028/29</td>
<td>$1,539,342</td>
</tr>
<tr>
<td>2029/30</td>
<td>$1,576,286</td>
</tr>
<tr>
<td>2030/31</td>
<td>$1,614,117</td>
</tr>
</tbody>
</table>

The annual sewer maintenance programme is well funded and in practice would go some way to ensuring that the deficit in (theoretically) unfunded renewals does not translate into a reduction of level of levels in real terms.

Council’s long term financial plan covers the first 10 years of the 20 year planning period. The total maintenance and capital renewal expenditure required over the 10 years is $142,708 million.

This is an average expenditure of $142,708 pa. Estimated maintenance and capital renewal expenditure in year 1 is $11,478,977. The 10 year sustainability index is 0.80. In the medium term the funding of the sewer reticulation network is adequate.
6.2 Funding Strategy

Projected expenditure identified in Section 6.1 is to be funded from Council's operating and capital budgets.

Ideally Council would maintain the sewer reticulation network at condition 1 or 2. Subterranean pipe networks make condition inspections expensive and not necessarily definitive. Further to the difficulty and expense of inspections is the maintenance work, generally in the form of renewal for pipes. Due to the ‘go/no go’ nature of the sewer network, the benefits of such a programme in terms of additional level of service offered to the consumers are very minimal. The balance between providing a reliable service and ensuring that the network is maintained to a level that provides long term service are the responsibility of the Council’s sewer engineers with only small input from consumers.

The council funds all work to the sewer reticulation service through income raised by the waste water levy applied to all urban residential lots. The structure of rates payable is reviewed each year and published in the annual management plan.

The current levels of funding are proving adequate in the short and medium term. An increase in the funds available for asset renewal should be considered.

6.3 Valuation Forecasts

Asset values are forecast to increase as additional assets are added to the asset stock from construction and acquisition by Council and from assets constructed by land developers and others and donated to Council.

The depreciated replacement cost (current replacement cost less accumulated depreciation) will vary over the future depending on the rates of addition of new assets, disposal of old assets and consumption and renewal of existing assets.

6.4 Key Assumptions made in Financial Forecasts

This section details the key assumptions made in presenting the information contained in this asset management plan and in preparing forecasts of required operating and capital expenditure and asset values, depreciation expense and carrying amount estimates. It is presented to enable readers to gain an understanding of the levels of confidence in the data behind the financial forecasts.

Key assumptions made in this asset management plan are:

- Useful life and value of assets are calculated using the NSW Reference Rates Manual for Valuation of Water Supply, Sewerage and Stormwater Assets published by the NSW Office of Water in June 2014. Updates on rate changes are published annually to keep valuations current.

- Annualised CPI of approximately 2.4% for the 2014/2015 financial year. A continued annualised CPI of 2.4% over the 20 year long term planning period. With the uncertainty in current markets the actual CPI may differ significantly from this figure.

- Depreciation is calculated on a straight line method

Accuracy of future financial forecasts may be improved in future revisions of this asset management plan by the following actions.

- Improving the accuracy of unit rates by collecting more detailed financial information from construction work and comparing and adjusting the unit rates derived from the NSW Office of Water.
7. ASSET MANAGEMENT PRACTICES

7.1 Accounting/Financial Systems

Council currently uses Civica Authority as the primary Corporate System Administrator: IT manager

Relevant accounting standards are:
- AAS 27 “Financial Reporting by Local Governments”
- AASB 136 Impairment of Assets
- AASB 1021 Depreciation of Non-Current Assets
- AASB 1041 Accounting for the reduction of Non-Current Assets
- AAS 1015 Accounting for acquisition of assets

7.2 Asset Management Systems

Council uses CONFIRM asset management software. The current version is 15.10.AM.6106

CONFIRM team:
Team leader: Administration Engineer
Administrator: Asset Engineer
Data entry: 2 x Asset Technicians
Field inspections: Asset Inspector

CONFIRM consists of:
- A comprehensive sewer inventory;
- Condition rating for the sewer where available network;
- Data Management, with functional reporting procedure to present inventory and assessment information;
- Asset Accounting, AAS27 reporting capability and life cycle costing; and
- Council uses MapInfo GIS system linked to CONFIRM.
- A number of handheld GPS devices are used to collect data in the field.

As a result of this plan it is intended to improve the Asset management system by:
- Ascertaining more accurate unit rates for work performed in the sewer network.
- Linking of Confirm to Financial Software to gain more accurate costs of works.

7.3 Information Flow Requirements and Processes

The key information flows into this asset management plan are:
- The asset register data on size, age, value, remaining life of the network;
- The unit rates for categories of work/material;
- The adopted service levels;
- Projections of various factors affecting future demand for services;
- Correlations between maintenance and renewal, including decay models;
- Data on new assets acquired by council.
The key information flows from this asset management plan are:

- The assumed Works Program and trends;
- The resulting budget, valuation and depreciation projections;
- The useful life analysis.

These will impact the Long Term Financial Plan, Strategic Business Plan, annual budget and departmental business plans and budgets.

The current communication between financial and asset systems is limited to manually entering the relevant data. CONFIRM provides asset valuations and capitalisations. These figures are supplied to the finance system for reporting purposes.
8. CONCLUSION

The provision of sewer service is one of Council’s Principal Activities. Council provides the sewer reticulation network to the urban area which also includes the villages of Raglan, Eglinton and Perthville.

The current network consists of 395.70km of pipes, approximately 7,290 sewer pits and 33 pump stations. Over the last 10 years the network has increased in length at an average of 1.8%p.a. and 10 pump stations (all small local catchment units). The average age of the pipe and pit sewer assets is 37 years. The average age of the sewer pump stations is 17 years.

The Bathurst sewer supply dates back to 1917. There are possibly some original pipes still in use in the network, making them almost 100 years old. Approximately 11% of the network has been assessed as in poor or bad condition, based on the age of the pipes.

The current replacement cost of the reticulation network is $180.342 million. The annual depreciation expense is $2.372 million. Assets are valued every 12 months and were last reported in 2012. Asset valuations are at greenfield rates.

The current maintenance and repair budget for the entire reticulation network is approximately $1,560,283 p.a.

Customer requests regarding the sewer system have, on a monthly average remained static. This suggests that the level of service provided by the sewer reticulation system being maintained and current maintenance expenditure is adequate.

In technical terms the maintenance budget appears to be adequate for the reticulation system as it stands. A more thorough maintenance management system will better allow the Council to ascertain the effectiveness of the budget allocation.

The budget for maintenance and repair is currently forecast by adding an additional amount due to CPI on the previous year’s budget. As the reticulation assets age and the network expands to meet the growth in areas of Bathurst, the expenditure required to meet maintenance needs will increase at a rate higher than the extra for CPI. If the current level of maintenance is not increased inline with the increasing maintenance requirements of the reticulation network more surcharge incidents and a generally lower level of service could be reasonably expected.

The assets within the reticulation network have varied useful lives as published in the NSW Office of Water Reference Rates Manual, 2014. The Reference Rates manual gives useful lives of sewer pipes ranging from 40 years for ductile iron pipe to 70 years for uPVC and vitreous clay. In reality the individual assets within the pipe network have different life expectancies dependant not only the material of their construction, but the make up of the waste water in the pipe and the ground the pipe is laid in. Although the final assessment on capital renewal of sewer pipes will be based on the criteria in 5.4.1, asset age is the best indicator available to predict the future expenditure required to replace footpath infrastructure that has deteriorated to a point where it is no longer serviceable.

The information contained within the asset management plan sets a benchmark for the sewer reticulation network at the close of the 2015 calendar year. By continuing to collect information on the condition of the network and closely monitoring the expenditure on maintenance and renewal of the network the performance of the Council’s sewer reticulation strategies can be measured, reported on and improved in the future.
9. PLAN IMPROVEMENT AND MONITORING

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

- The degree to which the required cashflows identified in this asset management plan are incorporated into council’s long term financial plan and Strategic Management Plan;
- The degree to which 1-5 year detailed works programs, budgets, business plans and organisational structures take into account the ‘global’ works program trends provided by the asset management plan;

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

<table>
<thead>
<tr>
<th>Task No</th>
<th>Task</th>
<th>Responsibility</th>
<th>Resources Required</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Employ a dedicated staff member to apply asset management to the sewer plant and its many assets.</td>
<td>Manager of Water and Sewer/ Director of Engineering</td>
<td>1 x Staff</td>
<td>Within 5 years</td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8.3 Monitoring and Review Procedures
This asset management plan will be reviewed during annual budget preparation and amended to recognise any changes in service levels and/or resources available to provide those services as a result of the budget decision process.

The Plan has a life of 4 years and is due for revision and updating within 2 years of each Council election.
REFERENCES
APPENDICES

Appendix A

Summary of system issues for future modelling of the Bathurst Sewer Network
Appendix A Figure 2 – Cost benefit and risk reduction