



WATER SUPPLY ASSET MANAGEMENT PLAN

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1.0 Introduction

1.1 Objectives of this Plan

Asset Management Overall objective

Council's water supply infrastructure represents a significant investment by the community and is vital to its health and future growth. The overall objective of asset management (AM) is:

- Demonstrate responsible management
- To communicate and justify funding requirements
- To comply with statutory/regulatory requirements
- To provide operate and maintain physical assets over their whole life cycle to achieve the required levels of service at the least life cycle cost while still satisfying corporate goals.

Specific purpose

The specific purpose of this plan is to:

- Demonstrate responsible stewardship;
- Define and articulate how the infrastructure is and will be managed to achieve Council's objectives;
- Provide a basis for customer consultation to determine the appropriate levels of service;
- Manage risk of asset failure;
- Achieve savings by optimising whole of life costs; and
- Support long term financial planning.

1.2 Scope of This Plan

Central Tablelands Water is the trading name adopted by Central Tablelands County Council, a water supply authority constituted under NSW Local Government legislation. The Council is located in the central west of New South Wales and services a geographically large, but sparsely populated area. This area ranges from Blayney in the east, to Grenfell in the west.

We currently have approximately 5,620 connections and provide potable water to around 11,500 consumers in 14 towns and villages. Our main water source is Lake Rowlands. Water from this source is supplemented by various groundwater bores during summer.

Lake Rowlands Dam, formerly known as Coombing Dam, is situated on the Coombing Rivulet, a tributary of the Belubula River. The Dam was designed in 1939 by Gutteridge, Haskins and Davey as a reinforced concrete slab and buttress type dam with a top water level (TWL) at RL 882.70m. Construction was carried out in the period 1949 to 1954. The dam has a gross storage volume of 4,500 megalitres and the TWL was constructed to RL 877.82m, 5 metres below the original design height.

The storage catchment area is approximately 197 square kilometres and the surface area of the dam, when full, is approx. 0.8 square kilometres (80 hectares).



Lake Rowlands

Scope and value of the assets

The scope and value of the assets covered by this plan are identified in the following table:

Asset Type	Unit	Quantity	Replacement Value
Lake Rowlands Supply Area			
Water Filtration Plants	ea	3	\$ 10,980,439.52
Pump Stations	ea	32	\$ 3,434,205.00
Bores	ea	6	\$ 276,400.00
Reservoirs	ea	40	\$ 12,039,840.00
Dams - Lake Rowlands	ea	1	\$ 18,459,420.00
Dams - Bogolong	ea	1	\$ 1,348,864.00
Telemetry	ea	28	\$ 316,289.52
Trunk Main 25mm	m	360	\$ 21,000.00
Trunk Main 50mm	m	8	\$ 446.00
Trunk Main 100mm	m	21,327	\$ 2,079,768.25
Trunk Main 150mm	m	80,160	\$ 11,810,702.16
Trunk Main 200mm	m	89,205	\$ 11,819,633.36
Trunk Main 225mm	m	43,187	\$ 5,722,295.19
Trunk Main 250mm	m	17,836	\$ 3,119,435.62
Trunk Main 300mm	m	17,681	\$ 3,767,194.82
Trunk Main 324mm	m	713	\$ 151,871.95
Trunk Main 375mm	m	9,258	\$ 2,953,981.65
Reticulation Main 25mm	m	804	\$ 46,846.85
Reticulation Main 32mm	m	43	\$ 2,523.84
Reticulation Main 38mm	m	2,759	\$ 160,826.38
Reticulation Main 40mm	m	309	\$ 18,011.34
Reticulation Main 50mm	m	6,367	\$ 371,171.03
Reticulation Main 56mm	m	146	\$ 8,524.20

Reticulation Main 58mm	m	2,214	\$	129,057.58
Reticulation Main 63mm	m	1,706	\$	99,488.54
Reticulation Main 65mm	m	26	\$	1,524.94
Reticulation Main 75mm	m	12,388	\$	722,220.65
Reticulation Main 80mm	m	15,315	\$	1,185,057.73
Reticulation Main 100mm	m	178,801	\$	17,435,703.09
Reticulation Main 110mm	m	101	\$	9,805.05
Reticulation Main 125mm	m	922	\$	89,930.18
Reticulation Main 150mm	m	30,619	\$	4,511,416.45
Reticulation Main 180mm	m	268	\$	26,106.91
Reticulation Main 200mm	m	5,643	\$	747,655.96
Reticulation Main 250mm	m	235	\$	41,085.59
Reticulation Main 300mm	m	1,964	\$	418,504.31

Total \$ 114,327,247.67

Quandialla

Pump Stations	ea	3	\$	162,463.00
Bores	ea	2	\$	106,560.00
Reservoirs	ea	6	\$	125,000.00
Telemetry	ea	1	\$	10,192.48
Trunk Main 100mm	m	16,320	\$	1,591,543.81
Reticulation Main 100mm	m	2,308	\$	225,066.52
Reticulation Main 150mm	m	312	\$	45,942.48

Total \$ 2,266,768.29

Condition assessment of the infrastructure assets as at 30/06/2009

Asset	Capacity	Year of Construction	Design Life	Condition 1 - Poor 10 - Perfect
Storages - Lake				
Rowlands	4,500 ML	1950	100 yrs	6
- Bogolong	295 ML	1930	100 yrs	3
Reservoirs				
Blayney - Hill Street	1.14 ML	1930	100 yrs	6
- Filtration Plant	4.55 ML	1966	100 yrs	6
- Patricks Subdvn	0.45 ML	1974	100 yrs	6
- Plumb Street	0.91 ML	1958	100 yrs	6
Millthorpe	1.36 ML	1954	100 yrs	6
Trunk Main 'D' - Browns Creek	0.23 ML	1954	100 yrs	6

Asset	Capacity	Year of Construction	Design Life	Condition 1 - Poor 10 - Perfect
Carcoar - Village	0.68 ML	1954	100 yrs	6
- Filtration Plant	2.16 ML	1954	100 yrs	4
Mandurama	0.91 ML	1954	100 yrs	6
Lyndhurst	0.68 ML	1954	100 yrs	6
Garland	0.09 ML	1954	100 yrs	6
Bangaroo No.1	0.18 ML	1968	100 yrs	6
Bangaroo No.2	0.18 ML	1968	100 yrs	6
Bangaroo No.3	0.18 ML	1968	100 yrs	6
Gooloogong Bore	0.18 ML	1977	100 yrs	6
Grenfell -West	1.36 ML	1930	100 yrs	6
- South	0.09 ML	1970	100 yrs	6
- East No 1	0.18 ML	1965	100 yrs	7
- East No 2	0.45 ML	1990	100 yrs	9
- North	4.55 ML	1959	100 yrs	6
Eugowra -Main	1.36 ML	1955	100 yrs	6
- Hill Street No. 1	0.09 ML	1971	100 yrs	6
- Hill Street No. 2	0.40 ML	2003	100 yrs	9
- Bore	0.09 ML	1977	100 yrs	6
Trajere	0.14 ML	1965	100 yrs	6
Pyes Gap	0.14 ML	1965	100 yrs	6
Canowindra	0.91 ML	1933	100 yrs	6
South Canowindra No. 1	0.18 ML	1986	100 yrs	6
South Canowindra No. 2	0.27 ML	1990	100 yrs	6
North Canowindra No.1	0.09 ML	1967	100 yrs	6
North Canowindra No.2	0.09 ML	1967	100 yrs	6
Morebel	1.14 ML	1955	100 yrs	6
Nyrang Creek No 1	0.14 ML	1969	100 yrs	6
Nyrang Creek No 2	0.09 ML	1969	100 yrs	6
Nyrang Creek No 3	0.05 ML	1969	100 yrs	6
McDonalds Lane	0.14 ML	1981	100 yrs	6
Cargo	0.68 ML	1957	100 yrs	6
Cudal	0.23 ML	1957	100 yrs	6
Manildra	0.45 ML	1957	100 yrs	6
Greys Hill	2.27 ML	1962	100 yrs	6
Quandialla x 7	0.18 ML	2002	100 yrs	9

Asset	Capacity	Year of Construction	Design Life	Condition 1 - Poor 10 - Perfect
Bores				
Bangaroo		1999	30 yrs	5
Bangaroo -Standby		1987	30 yrs	5
Cudal		1994	30 yrs	8
Gooloogong No. 1		1993	30 yrs	6
Gooloogong No. 2		1987	30 yrs	2
Quandialla		2002	30 yrs	7
Filtration Plants				
Blayney Water Filtration Plant	6 ML/day	1966	50 yrs	4
Carcoar Water Filtration Plant	9 ML/d ML/day	2002	50 yrs	8
Pumping Stations				
Blayney Shire - 8 Pumping Stations			50	7
housing 18 pumps of varying sizes			25	7
Cabonne Shire - 13 Pumping Stations			50	7
housing 24 pumps of varying sizes			25	7
Weddin Shire - 7 Pumping Stations			50	7
housing 17 pumps of varying sizes			25	7
Trunk Mains				
Trunk Main 'A' - Lake Rowlands to Carcoar WFP				
375mm x 4.81 kms		1955	70 yrs	4
Trunk Main 'B' -Carcoar WFP to Mandurama				
250mm x 5.47 kms		1955	70 yrs	4
Trunk Main 'C' - Mandurama to Gooloogong				
200mm x 16.33 kms		1946-1955	70 yrs	3
225mm x 47.50 kms		1946-1955	70 yrs	3
250mm x 8.68 kms		1946-1955	70 yrs	3
Trunk Main 'D' - Carcoar WFP to Browns Creek P/Stn				
200mm x 19.88 kms		1955	70 yrs	5
Trunk Main 'E' - Browns Creek P/Stn to Blayney - 150mm x 3.15 kms		1954	70 yrs	5
Trunk Main 'F' -Browns Creek P/Stn to Millthorpe - 150mm x 8.38 kms		1954	70 yrs	5
Trunk Main 'G' - Trunk Main 'C' to Lyndhurst - 100mm x 2.13 kms		2007	70 yrs	9
Trunk Main 'K' -Gooloogong to Grenfell				
200mm x 34.12 kms		1946	70 yrs	1
Trunk Main 'L' - Gooloogong to Eugowra				
150mm x 20.00 kms		1980	70 yrs	6
Trunk Main 'P' - Trunk Main 'C' to Somers				
100mm x 1.72 kms		1955	70 yrs	2
100mm x 1.50 kms		1990	70 yrs	8

Asset	Capacity	Year of Construction	Design Life	Condition 1 - Poor 10 - Perfect
Trunk Mains				
Trunk Main 'Q' - West Wyalong Road to Quandialla	100mm x 17.50 kms	2003	70 yrs	8
Trunk Main 'U' - Trunk Main 'C' to Manildra	150mm x 34.39 kms	1957	70 yrs	4
	150mm x 12.10 kms	2004	70 yrs	9
	100mm x 12.21 kms	1957	70 yrs	5
Trunk Main 'V' - Trunk Main 'C' to Morebel	200mm x 4.20 kms	1990	70 yrs	7
Trunk Main 'X' -Lake Rowlands to Blayney	375mm x 1.61 kms	1966	70 yrs	5
	300mm x 13.33 kms	1966	70 yrs	5
Reticulation Mains				
Blayney Shire - 100mm x 51.20 kms		1930-2005	70 yrs	4
- 150mm x 15.68 kms		1930-1970	70 yrs	4
- 200mm x 1.15 kms		1930	70 yrs	4
- 300mm x 3.94 kms		1965-1973	70 yrs	4
Cabonne Shire - 58mm x 1.13 kms		1957	70 yrs	6
- 100mm x 71.35 kms		1930-2005	70 yrs	6
- 150mm x 10.23 kms		1950-2005	70 yrs	6
Weddin Shire - 100mm x 39.41 kms		2002-2003	70 yrs	9
- 150mm x 2.05 kms		2002-2003	70 yrs	9
- 250mm x 2.84 kms		2003	70 yrs	9
Buildings				
Blayney	Bulk Store	1972	70 yrs	5
	Chemical Shed	1972	70 yrs	5
	Workshop	1972	70 yrs	5
Canowindra	Office	1973	50 yrs	4
	Workshop/Store	1994	70 yrs	7
Grenfell	Workshop and Office	1997	70 yrs	8
Administration Office - Blayney		1930	100 yrs	5

1.3 The Asset Management Plan

The AM plan is a tool combining management, financial, engineering and technical practices to ensure the level of service required by customers is provided in the most efficient and economical manner possible to the community. The plan is also intended to protect the environmental and cultural values of the assets providing the service.

This AM plan is a written representation of intended AM programmes for the water infrastructure network based on CTW's understanding of customer requirements, existing and projected network and the asset conditions and performance.

The plan is the medium by which Council articulates its management of its water supply infrastructure to achieve the desired outcomes.

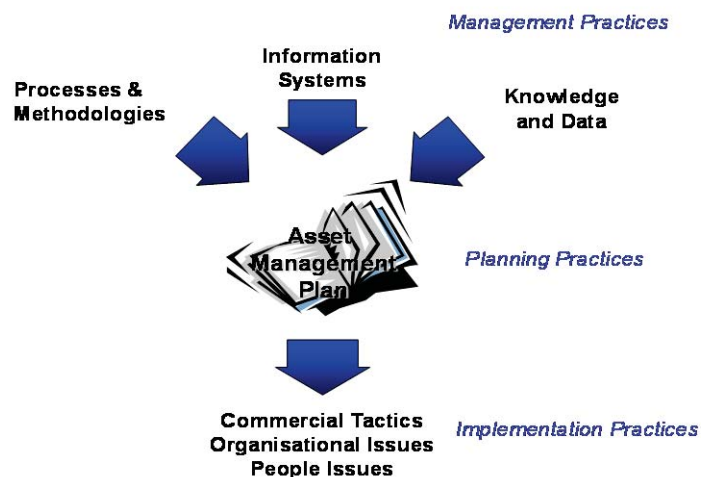


Figure 1-1: Asset Management Plan

The scope of the AM Plan relates to the four broad AM plan inputs and outputs.

Processes: The processes, analysis and evaluation techniques needed to support effective lifecycle AM.

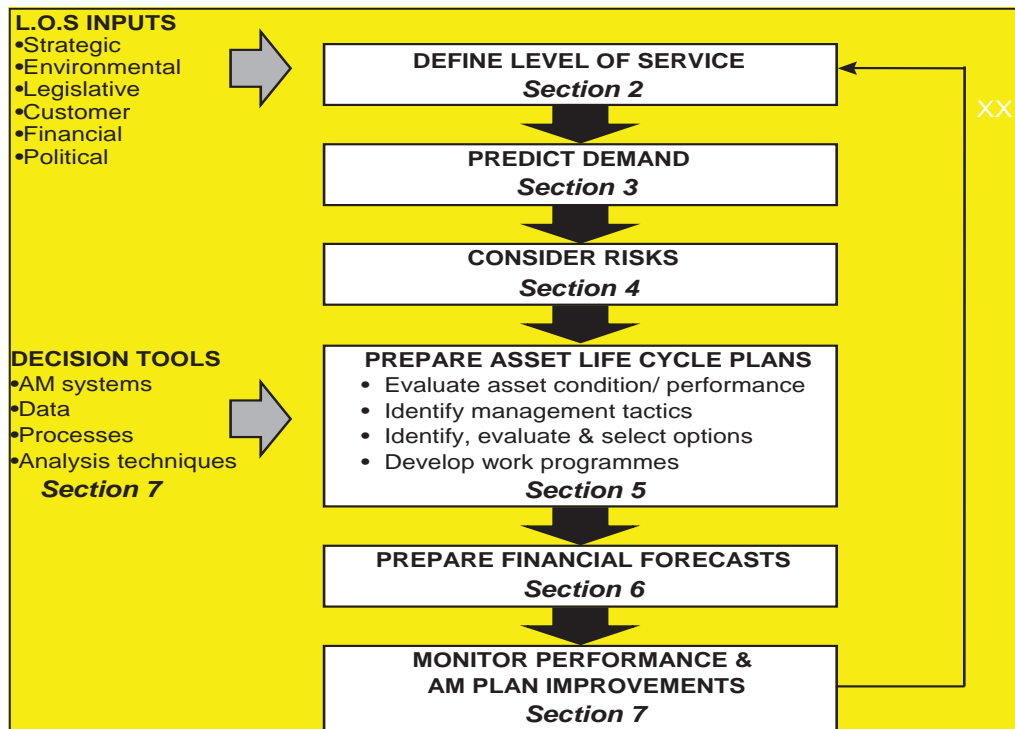
Information Systems: The information systems to support AM processes and manipulate data.

Data: Appropriate, accessible and reliable data for manipulation by information systems to produce the outputs required.

Implementation Tactics: Including organisation, contractual and people issues.

1.4 Plan Format

The figure below follows the logic of the AM planning process and illustrates the relevant AMP section references in this plan.



1.5 Key Stakeholders

This plan is intended to demonstrate to stakeholders that Council is managing the assets responsibly. The key stakeholders include:

- State and Federal Government;
- Councillors;
- Community;
- Visitors;
- Utilities/Developers;
- Employees/Volunteers;
- Contractors/Suppliers;
- Insurers;
- Auditors – internal/external;
- Grant Providers;
- Constituent Councils;
- Central West Utilities Alliance (CWUA)
- Regulators;

1.6 Legislative Requirements

There are a number of Acts that affect the management of water supply assets. These Acts mainly affect environmental protection and performance criteria. The principal ones are:

- Local Government Act 1993
- Australian Drinking Water Guidelines 2011
- The Pollution Control Act 1994
- The Clean Water Act 1970

- Protection of the Environment Operations Act 1997
- The Environmentally Hazardous Chemical Act 2008
- Environment Protection Act 1994
- Environmental Planning and Assessment Act 1979
- Catchment Management Act 1989
- Soil Conservation Act
- Work Cover
- Protection of Threatened Species Act
- Fisheries Act
- Work Health & Safety Act 2012
- Government Pricing Tribunal Act 1992

1.7 Relationships with Other Plans and Documents

AM Plans are a key component of the Council planning process linking with the following plans and documents:

- CTW Strategic Management Plan - The Plan incorporates Council's budget for the next 12 months with projections for the following ten years, and also a thirty year Capital Works Financial Plan. The plan also reflects Council's priorities and the direction being taken in the short term, the next ten years and long term thirty year period.
- Operating Management Plan.
- CTW Section 64 Developer Servicing Plan.

1.8 Rationale for Asset Ownership

Local Authorities exist principally to supply core services that meet the needs of their communities. What services are provided, and how they are provided, depends on the level of service required by the community.

Membership in the CWUA will provide assistance with the development of best practice strategies, obtaining funding and skill and resource sharing between member councils.

As the water supply asset owner CTW will continue to provide a water supply system of superior environmental sensitivity that is reliable and efficient and meets current and future community needs at an affordable cost.

2.0 Levels of Service

2.1 Introduction

Levels of Service provide the basis for the life cycle management strategies and works programme identified within the AM Plan. They support the CTW's strategic goals and are based on the expectations of CTW's customers, and statutory requirements.

Levels of service are there so that the community knows what to expect and are based to a certain extent upon what the community wants. CTW's objective when planning for asset management is to match the level of service provided by the asset with the expectations of the consumer and visitors to the shire. The expectations of the consumer will be continually monitored so that the levels of service of the asset can be maintained appropriately. CTW will endeavour, through the levels of service, to provide the most cost efficient and value for money service to its consumers.

The levels of service in this Section will be used:

- to inform the consumers of CTW of the proposed type and level of service to be offered;
- develop asset management strategies to deliver the required level of service;
- to identify the costs and benefits to the consumer of the services offered;
- to enable the consumers of CTW to assess suitability and value for money of the services offered;
- as a measure of the performance of the AM Plan, and;

The levels of service outlined in this Section are based on:

- Community Research and Expectations
- Information gathered from customers on expected quality and cost of services;
- CTW's mission and strategic objectives as detailed in Councils Strategic/Management Plan - 2010/2015;
- Availability of resources, particularly financial constraints;
- Legislation, Regulations, Environmental Standards and Council by-laws that impact on the way assets are managed;
- Council policies and procedures;
- Design Standards and Codes of Practice;
- Australian Design Standards also provide the minimum design parameters for infrastructure delivery by the Professional Engineer
- Research conducted to predict future trends.

The relationship between 'levels of service' with key Council plans is outlined in the figure below:



2.2 Levels of Service Requirements

This section identifies the necessary criteria to develop appropriate levels of service by considering legislative, customer and strategic needs. Council will continue to provide services to the current high level and in addition will endeavour to improve on the following requirements as shown below.

LEGISLATIVE	
Key Service / Performance Criteria	Reference:
1. Need to be more accountable and need for better use of management plans, and comply with State Government Best Practice requirements. 2. Need for continual upgrading of system 3. Maintain user pays pricing system	Local Government Act 1993 NSW Office of Water Best Practice Requirements Environmental Offences and Penalties Act 1989 & Environmental Planning and Assessment Act 1979. Public Health Act Work Health & Safety Act 2012 Government Pricing Tribunal Act 1992
CUSTOMER	
Key Service / Performance Criteria	Reference:
1. Reliability 2. Value/Affordability 3. Maintenance	CTW Strategic Business Plan for Water Supply Services CTW Social and Community Plan Locality Meetings

STRATEGIC / CORPORATE GOALS	
Key Service / Performance Criteria	Reference:
1. Reliability 2. Value/Affordability 3. Maintenance 4. Compliance with Legislation 5. Customer satisfaction	As above CTW Management Plan 2010 - 2021

2.3 Community Research and Expectations

This Section outlines Council's knowledge and research of customer expectations. It describes the methods of collecting data and outlines how this information is used.

Customer Research and Expectations

Council's customer research into water supply infrastructure needs and satisfaction has included:

- Locality meetings
- Receipt of complaints

2.3.1 Community Satisfaction Survey

From time to time CTW will undertake *Community Satisfaction Surveys* to gain extra feedback and gauge the consumer's level of satisfaction with the current service.

The first of these surveys is planned for early 2012/2013.

Interpretation of results

Council will use the community satisfaction surveys as a performance measure of customer satisfaction.

2.4 Strategic and Corporate Goals

This Section outlines the specific levels of service, which CTW wishes to achieve, as defined in its Strategic/Management Plan 2008/2013 and Asset Management Policy. It also outlines details of Best Practice. Council's strategic goals and mission statement for water supply are also detailed in this section.

Council's Vision and Mission

The Council Mission:

"Central Tablelands Water will develop a commercial focus as it operates in partnership with the communities it serves, fostering their development and growth, while maintaining both its level of service and its prices at an acceptable level."

The Council's Vision:

Central Tablelands Water sees its future as a Regional Water Authority, independent of other agencies. It sees itself as a responsible member of the communities it serves, aiding the development of the region. It will continue to develop further sources of water and continue to supply an economical and acceptable water supply to its customers, and it will do so in an ecologically sustainable manner. Central Tablelands Water will continue to evolve its method of operations to incorporate a sound commercial focus. It will do so without compromising on the services it provides, becoming more efficient and maintaining process at a reasonable level.

AM Policy

CTW is currently developing an AM policy with consideration of points as detailed below, identified as needed through AM plan development.

The Council's Vision in its Asset Management Policy will be:

To develop, implement and continually review an Asset Management Plan that will:

- Apply to all the asset groups under the care and control of CTW;
- Include a total life cycle approach to asset needs identification to asset disposal;
- Will be subject to a disciplined continuous improvement program

Asset Management goals identified for inclusion in the Asset Management Policy are:

- To work closely with consumers to meet their needs, taking into account an appropriate balance between service delivery, risk, reliability and costs;
- To act in a manner which is consistent with the preservation of the natural environment and the sustainable management of resources;
- To achieve a position of leadership in the water utility industry.

2.4.1 Best Practice

Best Practice management is fundamental to the effective and efficient delivery of water supply services.

The NSW Government is required to demonstrate compliance with National Competition Policy. From 1 July 2004, compliance with the six best-practice criteria is mandatory for future assistance under the Country Towns Water Supply & Sewerage Program.

With increasing demands on the limited water resources of NSW, it is vital that these resources are managed in an efficient and sustainable manner.

Best-practice management is essential for efficient and sustainable management of water resources and the environment. It enables Council to achieve sustainable water supply business and comply with National Competition Policy.

Best-practice management involves a triple bottom line focus that provides a balanced view of the long-term sustainability of NSW water utilities. Triple bottom line accounting (social, environmental and economic) involves consideration of Council's business plan together with its social and environmental management practices.

Best-practice management of water supply and sewerage involves the following six criteria:

- Strategic Business Planning
- Pricing and Developer Charges
- Demand Management
- Drought Management
- Performance Reporting
- Integrated Water Cycle Management

2.5 Legislative Requirements, Standards and Codes of Practice

This Section details CTW's legal obligations relating to the management of its water supply infrastructure assets. It outlines the relevant legislative requirements, standards and codes of practice that Council must adhere to in order to provide an appropriate water treatment and reticulation service.

Legislative Requirements, Standards and Codes of Practice.

The following legislative requirements, Standards and Codes of Practice, with respect to levels of service, are to be taken into account:

REFERENCE	DETAILS
Local Government Act 1993	Provide a legal framework for an effective, efficient, environmentally responsible, and open system of Local Government in NSW.
Australian Drinking Water Guidelines – NHMRC 2011 & NRMCC 2011	Outlines minimum quality standards for potable water.
Pollution Control Act 1994 Clear Air ACT 1961 The Clean Water Act 1970 Protection of the Environment Operations Act 1997 The Environmentally Hazardous Chemical Acts 2008	These acts give Environment Protection Authority the power to control pollution and the disposal of wastes, to protect the environment, and to avoid chemical contamination from both Government and private developments or works.
Environmental Planning and Assessment Act 1979	Specifies the environmental considerations required in all development activities.
Catchment Management Act 1989	To Co-ordinate policies, programs and activities as they relate to total catchment management.
Soil Conservation Act	The object of this Act is the conservation of soil resources and farm water resources and the mitigation of erosion and land degradation.
Public Health Act 2010	Consolidates Acts relating to Public Health and provides for the prevention of the spread of disease.
Work Health & Safety Act 2012	This Act details Council's responsibilities to ensure health, safety and welfare of employees and others at places of work.
Government Pricing Tribunal Act 1992	The Government Pricing Tribunal Act establishes the Government Pricing Tribunal and enables the Tribunal to determine and advise on prices and pricing policy for Government monopoly services.

2.6 Current/Target Levels of Service

This section details the current levels of service provided by Council, dividing them into *customer* and *technically* related groups, and the assets covered by those levels of service. This section also details where/how the levels of service have been derived.

Types of levels of service

The service levels are divided into two types:

- Customer related
- Technically related

Customer related levels of service relate to the function of the service provided and how the customer receives the service in terms of:

Level of Service	How the level of service was derived
Appearance	Customer feedback – letters, phone calls etc
Reliability	Customer expectations, quality of materials
Maintenance	Customer feedback and expectations
Responsiveness	Customer expectations, availability of resources
Availability	Customer expectation, assumption based on local knowledge
Safety	Legislative requirements, customer expectation
Affordability	Customer expectation, budgetary constraints
Empathy (understanding, individual attention)	Customer feedback , assumption based on local knowledge
Assurance/customer/community satisfaction	Customer expectations and feedback

Customer feedback is recorded using "Customer Service Request" forms and action is taken according to the severity of the fault, this is determined by an Intervention Level ranking as explained in Section 4.1.6.

Technically related levels of service relate to the technical measures and the outputs the customer receives in terms of:

<i>Level of Service</i>	<i>How the level of service was derived</i>
Quality	Legislation, customer expectation
Maintainability	Availability/quality of resources
Capacity	Size of asset, design constraints
Legislative requirements	Relevant Authorities
Cost Efficiency	Available resources, management of asset

Assets covered by Levels of Service

The following tables identify the current service levels adopted and the targets set by council for:

- Filtration Plants;
- Pump Stations,
- Reservoirs and
- Mains.

2.7 Levels of Service Tables

2.7.1 Community Levels of Service

Levels of Service

DESCRIPTION	UNIT	LEVEL OF SERVICE	
		Current	Target
AVAILABILITY OF SERVICE			
Normal Quantity Available:			
Domestic Peak day	L/tenement/day	3,000	3,000
Domestic Annual	kL/tenement/yr	254	254
Total Annual Average Consumption	ML/yr	2,110	2,000
Total Peak Daily Consumption (Potable)	ML/day	16	16
Peak/Average consumption	%	211	211
Fire Fighting:			
Compliance with the Water Supply Investigation Manual* (AS 2419.1 classifications 2,3,4 & 9 with floor area less than 1000 m2)	% urban area served	100	100
Pressure:			
Min. pressure when delivering 15 L/min	Metres head	20	20
Max. static pressure	Metres head	60	60
Flow Rates:			
Domestic (non-rural consumers) 15 L/min	litres/minute	25	25
Rural	litres/minute	6.3	6.3
Consumption Restrictions in Droughts:			
Level of restriction applied through a repeat of the worst drought on record			
- Average duration of restrictions	% Normal usage	0	0
- Average frequency of restrictions	No./ 10yr period	1	0
Supply Interruptions to Consumers			
Planned (95% of time):			
Notice given to domestic customers	Hours	48	48
Notice given to commercial customers	Hours	48	48
Notice given to major industrial and institutional customers	Days	7	7
Unplanned:			
Maximum duration	Hours	12	12
Frequency	No./yr/customer	2	<2

DESCRIPTION	UNIT	LEVEL OF SERVICE	
		Current	Target
Supply Failure: Priority 1 (Defined as failure to maintain continuity or quality of supply to a large number of customers or to a critical use at a critical time) During working hours Out of working hours	Hours Hours	1 2	1 2
Priority 2 (Defined as failure to maintain continuity or quality of supply to a small number of customers or to a critical use at a non-critical time) During working hours Out of working hours	Hours Hours	3 4	3 4
Priority 3 (Defined as failure to maintain continuity or quality of supply to a single customers)	Working Days	1	1
Priority 4 (Defined as a minor problem or complaint, which can be dealt with at a time convenient to the customer and the Council)	Weeks	1	1
Customer Complaints: – Personal/ Oral – Written Note: Times apply for 95% of occasions	Working Days Working Days	5 5	5 5
Service Provision: Time to provide a domestic individual connection to water supply in serviced area (95% of times)	Working days	10	10
WATER QUALITY (Should meet Drinking Water Quality Guidelines of Australia, NHMRC & NRMCC 2011)			
Microbiological Parameters: Total coliforms Thermo-tolerant coliforms Sampling frequency	CFU/100ml CFU/100ml Samples/week	98 100 52	98 100 52
Physico-chemical Parameters: pH Turbidity Fluoride Free available chlorine (WFP) Free available chlorine (Reticulation) Sampling frequency	Unit NTU mg/L mg/L mg/L Samples/year	7.5 <0.2 1 - 0.6 365	7.5 <0.2 1 - 0.6 365

DESCRIPTION	UNIT	LEVEL OF SERVICE	
		Current	Target
Percentage Compliance with 2011 NHMRC / NRMMC Australian Drinking Water Quality Guidelines:			
Physical parameters	%	100	100
Chemical parameters	%	100	100
Total coliforms	%	98	98
Thermo-tolerant coliforms	%	100	100

Note: the Levels of Service are the targets, which Council aims to meet; they are not intended as a formal customer contract.

3.0 Demand Forecast

3.1 Introduction

This Section of the plan analyses factors affecting demand including population growth, social and technological changes. Impacts of the growth trends including social, cultural, residential, commercial and industrial are examined and in particular the impacts on new and existing infrastructure.

Demand management strategies are place as a technique to modify demand without compromising customer expectations. A period of twenty years is considered.

3.2 Growth Trends

The key drivers of demand for CTW water infrastructure are:

- Population growth;
- Industrial growth;
- Residential Development;
- Demand for increased services; and
- Extensions to the network

3.2.1 Population

Current and future population demographics of the three constituent council's local government areas have an impact on demand on CTW's infrastructure. Following is an analysis of future trends with regard to population indicators such as age profile and population distribution within each of the LGA's.

Population Growth by LGA

Local Government Area	Population			Annual Growth (%)
	1996 Census	2001 Census	2006 Census	
Blayney	6,025	6,141	6,364	0.56 %
Cabonne	12,105	11,813	12,395	0.24 %
Weddin	3,831	3,660	3,641	-0.50 %
Totals	21,961	21,614	22,400	0.20%

Source: Australian Bureau of Statistics.

From the above data, it would appear that population growth within the LGA's overall is largely static, or in a steady small (less than 1.0%) incline.

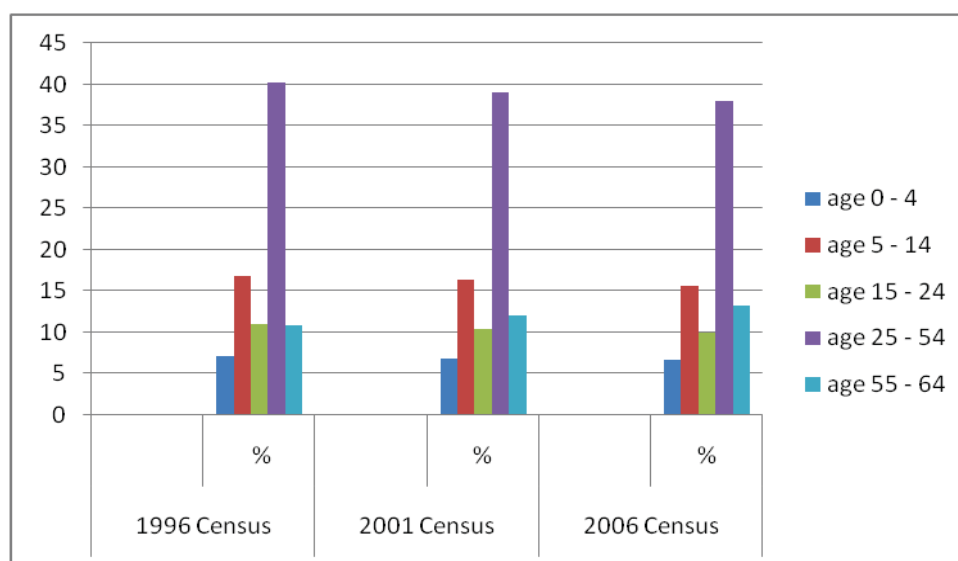
Future population projections make assumption that the past population trends will continue, namely static or steady incline in the overall populations, unless there was a specific event such as a large development that drew new consumers to a particular centre.

Age Profile across Overall LGA's

Age	1996 Census		2001 Census		2006 Census		
	Population	%	Population	%	Population	%	NSW Av.
0 - 4	1,574	7.2	1,483	6.9	1,466	6.7	6.3%
5 - 14	3,643	16.8	3,543	16.4	3,456	15.6	13.5%
15 - 24	2,377	11.0	2,267	10.5	2,216	10.0	13.6%
25 - 54	8,733	40.2	8,459	39.1	8,414	38.0	42.2%
55 - 64	2,366	10.9	2,602	12.0	2,920	13.2	11.0
65 plus	3,012	13.9	3,276	15.1	3,652	16.5	13.3
Totals	21,705	100%	21,630	100%	22,124	100%	100%

Source: Australian Bureau of Statistics

Age Profile across Overall LGA's (Graph Form)



The following trends can be noted from the Age Profile data above and as graphed above:

- Population proportions in the under 24 age groups have remained largely static over the 1996 – 2006 period.
- There has been a steady increase in population proportion in the over 55 age groups over the 1996 – 2006 period, such that the 2006 CTW LGA percentage is 6.4% higher than the 2006 NSW average.
- The “working age” population proportion (25 – 54 age groups) has been in steady decline over the 1996 – 2006 period, to an extent that the 2006 CTW LGA percentage for this age group is 8% below the NSW state average.

The above data suggests that the CTW LGA, overall, has an ageing population trend.

The 1996 – 2006 period has seen a decrease in working age population with a corresponding increase in population in the over 55 year of age groups.

3.3 Residential Impacts

With the exception of perhaps Blayney and Millthorpe, generally within the CTW supply area, in both urban and rural areas, there is not predicted to be significant change to existing residential trends, with existing population remaining static or with very slow increase or decline.

The village of Millthorpe has been identified as a potential growth centre, mainly due to its proximity to the regional centre of Orange. Growth in the town of Blayney appears to be benefitting from the increased gold mine development in the Shire. Neither of these should impact the water supply system substantially as growth is expected to be small and there is enough unused capacity available in the system for the foreseeable future.

3.4 Commercial/Industrial Impacts

Future commercial and industrial development within the 20 year forecast period is likely to be sporadic and difficult to predict. Isolated developments will have both initial and sustained impacts on the supply area in the form of:

- Spikes in population for high intensity phases such as construction with an ongoing employment demand dependant on development type.
- Increased demands on water services in regional centres as a result of population increase.

The current water supply infrastructure has enough capacity to service any increased load due any new developments in the foreseeable future.

3.5 Current Developments and Impacts

Due to the minor nature of future growth in the LGA, the primary goal of current asset planning is management of current infrastructure and continued upgrade of existing infrastructure to meet modern community expectations and best practice.

3.6 Impact of Trends on Infrastructure

3.6.1 Existing Infrastructure

Given the lack of any significant growth forecast over the next 20 year period, the overwhelming focus of this Asset Management Plan is management of Council's existing infrastructure base.

Aging of existing assets is an issue, in particular the trunk main system across the supply area, this has no bearing on its capacity to service future demand and is addressed in a later section of this plan.

3.6.2 New Infrastructure

New infrastructure will be provided to Council's water supply network generally through either development contribution or upgrade of existing infrastructure by Council.

Additional assets due to new developments are relatively minor and will not impact greatly on the capacity of the existing infrastructure

Council provided new asset infrastructure will generally be the replacement or upgrading of existing assets.

4.0 Lifecycle Management Plans

4.1 Introduction

This Section of the plan outlines exactly what is planned in order to manage and operate CTW's water supply assets at the agreed level of service (defined earlier in this plan) while optimising the lifecycle costs.

4.1.1 Section Contents

This section describes the lifecycle management plans for the following key asset groups:

1. Filtration Plants
2. Pump stations
3. Reservoirs
4. Reticulation
5. Trunk Mains

The lifecycle management plans outline for each asset:

- The objectives for the asset group.
- Supporting data for each asset group including:
 - Key life-cycle management issues
 - Physical parameters and value
 - Asset capacity/performance
 - Asset condition
 - Historical expenditure
- The management tactics to achieve the levels of service defined in Section 2, identified in the following work categories:
 - Operations and maintenance
 - Renewals
 - New works
 - Disposal

4.1.2 Work Category Definitions

Operations

Operations activities keep the asset utilised but have no effect on asset condition.

Asset operation has no effect on asset condition but is necessary to keep the asset appropriately utilised.

Typical operational activities for each asset group include:

Filtration Plants

- Power Costs
- Water Charges
- Rates
- Chemical costs for the treatment of the water
- Licensing fees
- Water testing
- Data collection and cataloguing
- Depreciation

Pump Stations

- Power Cost
- Rates
- Data collection and cataloguing
- Depreciation

Reservoirs

- Rates
- Data collection and cataloguing
- Depreciation

Reticulation & Trunk Mains

- Data collection and cataloguing
- Depreciation

For each of the operational activities an outline of how they are managed is detailed below.

Data collection and cataloguing

Captured and recorded via telemetry system.

Power costs

Pump and Filtration Plant running times are monitored via telemetry system and adjusted as necessary in order to achieve minimum operation time with maximum efficiency.

Water Charges

Purchase of raw water pumped from Lake Rowlands.

Rates

Charged to the asset on an annual basis for the services provided to the land the asset occupies

Chemical Costs

Regular testing of potable water to ensure water quality and optimum chemical usage. Subsequent adjustment of chemical usage and cost comparison if required.

Licensing fees

Payment of fees as per legislative requirements set by State Water. Council has no control of licensing fee structure. Review of license necessity annually.

Depreciation

Depreciation is charged to the asset as per legislative requirements. It is determined based on the expected life of the asset.

For Council budgetary reporting purposes (as defined in Council's Strategic Management Plan) *Operations* is classed as **Operating Expenditure**.

Routine Maintenance

Maintenance work is the day-to-day work required to maintain the asset's ability to provide the required service levels

It is the day to day work required to keep assets operating at required service levels, and falls into two broad categories:

- Planned or programmed (preventative) Maintenance: Proactive inspection and maintenance works planned to prevent asset failure.
- Unplanned (responsive) Maintenance: Response action to correct asset malfunctions and failures on an as required basis (i.e. emergency repairs).

Planned maintenance is carried out to optimise the life of the asset, monitoring by telemetry system and regular inspections but limited due to budgetary constraints. By collating the data from the above parameters and constraints, programs are formulated to prioritise and efficiently carry out the required maintenance.

Unplanned maintenance is generated by complaints and emergencies. Complaints are assessed and dealt with on a case by case basis, whilst emergencies are dealt with immediately.

The following table provides examples of planned and unplanned maintenance for each asset group.

Asset Group	Planned Maintenance	Unplanned Maintenance
Filtration Plant	Inspections & checks	Breakages
	Servicing of mechanical components	Breakdown
	Property maintenance	Electrical fault
		Telemetry fault
Pump Stations	Inspections & checks	Pump breakdown
	Servicing of pumps	Electrical fault
	Property Maintenance	Telemetry fault
Reservoirs	Inspections & checks	Valve replacement
	Valve exercising	Telemetry fault
	Desilting	
	Property maintenance	
Reticulation & Trunk Mains	Inspections & checks	Leak repairs
	Mains flushing	Mains flushing (dirty water)
	Valve exercising	Mains break repairs
	Hydrant maintenance	Valve repairs
		Hydrant repairs
		Meter replacement

Maintenance is defined in each section of the lifecycle plan, and includes:

- All repairs/maintenance which are not classified as renewals
- All inspections planned and unplanned

A key element of advanced AM planning is determining the most cost-effective mix of planned and unplanned maintenance.

Renewals

Renewal work is the substantial replacement of the asset or a significant asset component to its original size and capacity

These works are defined as being:

- The renewal and rehabilitation of existing assets to their original size and capacity, or,
- The replacement of the entire component of the asset with the equivalent size or capacity, or,
- The replacement component of the capital works which does not increase the capacity of the assets (that portion of the work which restores the assets to their original size and capacity).

Renewals expenditure includes the following:

- Replacement of existing mains
 - With the same capacity along existing alignment
 - Upgrading along existing alignment
- Replacement of valves and hydrants
- Rehabilitation of pump stations
 - Replacement/upgrading of components
 - Upgrading of switchboard
 - Upgrade capacity of pump station
- Replacement of existing pump stations
- Rehabilitation of Filtration Plant/s
 - With the same capacity
 - Upgrade of components
 - Replacement of existing surfacing – concrete, asphalt, brick and other pavers
- Replacement of Filtration Plant/s

For Council budgetary reporting purposes (as defined in Council's Strategic Management Plan) *Renewals* are classed as **Non-Operating Expenditure (or Capital Works)**. Planned renewals are identified in Councils Thirty Year Financial Plan.

New Works

New works create an asset that did not exist, or extend an asset beyond its original size or capacity.

Projects (including land purchase) for the extension or upgrading of assets required to cater for growth or additional levels of service, including:

- Works which create an asset that did not exist in any shape or form, or
- Works which improves the Filtration Plants, pump stations, reservoirs or reticulation beyond their original size or capacity, or
- Upgrade works which increase the capacity of the Filtration Plant, pump stations, reservoirs or reticulation, or
- Works designed to produce an improvement in the standard and operation of the Filtration Plant, pump stations, reservoirs or reticulation beyond their current capacity.

For Council budgetary reporting purposes (as defined in Council's Strategic Management Plan) *New Works* are classed as **Non-Operating Expenditure (or Capital Works)**.

The CTW Forward Financial Plan reports on *Water Supply Services* as shown below.

Operating Expenditure

- Management Expenses
- Pumping Stations
- Reservoirs
- Water Filtration Plants
- Mains
- Miscellaneous (incl. Interest, Depreciation, Plant etc.)

Non-Operating Expenditure

- Loan Principal Repayments
- Transfer to Reserve
- Capital Works

Asset Disposal

Asset disposal is defined as the decommissioning and/or removal of the asset.

In the past Council has disposed of Filtration Plants and pump stations by decommissioning, removing useable equipment and isolating from the reticulation system. In some cases the land and remaining infrastructure has been disposed of otherwise the infrastructure has been left in place unused, unless there is a beneficial reason, site reestablishment is not undertaken.

Reticulation and trunk mains that have been replaced or rerouted are disconnected from the active mains and left in-situ.

Council currently has no policy in place for the disposal of water assets. There are no future plans for the disposal of any part of the water supply asset.

4.1.3 Asset Hierarchy

The asset hierarchy adopted by CTW is defined in this section together with an explanation of the purpose of the hierarchy.

The objective of developing an asset hierarchy is to provide a suitable framework for assets, which segments the asset base into appropriate classifications. The hierarchy can be based on asset function, asset type or a combination of the two. The hierarchy must however meet short and long term asset management requirements.

The intent of the asset hierarchy is to provide the framework in which data is collected, information is reported and decisions are made. In most cases organisations work with an informal asset hierarchy, however, this often leads to data being collected to inappropriate levels, thereby either creating situations where costs escalate with minimal increases in benefit or insufficient information is available to make informed decisions.

The asset hierarchy is used to structure the framework, to formalise the understanding of the levels at which decisions take place and to understand the levels at which actions such as data collection takes place and outputs are generated.

The adopted asset hierarchy is defined in the following table.

Water Supply Assets		
Asset Group	Asset Category	Asset Component
Filtration Plant	Carcoar WFP Blayney WFP Gooloogong & Cudal Chlorination Plants	Civil Mechanical Electrical
Pump Stations	Various locations (32)	Civil Mechanical Electrical
Reservoirs	Various locations (46)	Civil Electrical (telemetry)
Reticulation & Trunk Mains	Trunk Mains (295km) Reticulation Mains (278km)	Pipe sections (incl. valves and hydrants)
Dams	Lake Rowlands Dam Bogolong Dam	Civil Mechanical Electrical
Groundwater Bores	Various locations (5)	Civil Mechanical Electrical

4.1.4 Maintenance Contract

Council has no formal maintenance contract associated with any part of its water supply infrastructure.

4.1.5 Inspections

Inspections are designed to identify defects that have the potential to create a risk of damage or inconvenience to the public. The inspections are aligned with the hierarchy and recommend outcomes that may require maintenance or changes to processes. The inspections are designed to highlight and prioritise maintenance works and assist in the planning of future renewals.

Personnel undertaking the inspections have been trained to comply with relevant OH&S legislation to undertake the activities and are conversant with the Council's inspection procedures and safety requirements.

The following types of inspection are carried out:-

Maintenance Inspections/ Visual inspections

Inspections are currently carried out on a daily basis for Carcoar and Blayney WFP's. Checks include visual inspections of mechanical components (to see that they are running/operating O.K.), electrical components (Alarms and switches are operating to settings) and water testing for quality. The pump stations and reservoirs are inspected similarly on a weekly basis. The WFP's, pump stations and reservoirs are continuously monitored via telemetry.

Safety Inspections

A hazard analysis and risk assessment is carried out before commencing any job.

The following table details the inspection and inspection frequencies undertaken for each asset group.

Asset Group	Inspection Type	Frequency	Outcome
Filtration Plant -	Visual	Daily	Operating as expected – normally
Carcoar	Safety	Daily	Safe working environment
	Water Testing	Daily	Water Quality
	Telemetry	Continuously	Alarms – abnormal operation
Filtration Plant -	Visual	Daily	Operating as expected – normally
Blayney	Safety	Daily	Safe working environment
	Water Testing	Daily	Water Quality
	Telemetry	Continuously	Alarms – abnormal operation
Pump Stations	Visual	Weekly	Operating as expected – normally
	Safety	Weekly	Safe working environment
	Telemetry	Continuously	Alarms – abnormal operation
Reservoirs	Visual	Weekly	Operating as expected – no leaks
	Safety	Weekly	Safe working environment
	Telemetry	Continuously	Alarms – abnormal operation
Reticulation	Visual	As necessary	Repair fault

4.1.6 Intervention Levels

The intervention levels support the service levels provided to the community as they define the trigger points in determining the type of works to be carried out. They are also very useful in the development of ongoing maintenance programs.

Having defined intervention levels also assists council in being able to organise maintenance works on a risk priority basis, rather than be susceptible to carrying out works on a chronological basis, or as a result of pressure from individuals within the community i.e. complaints. Refer also to Section 2.6.

Defect	Measurement Criteria	Intervention Level	Response Time	Action
Pump Failure Low level at Raw Water intake Chemical Dosing System fault Low/High Reservoir level Plant Shutdown Chlorine leak	Yes/No	Yes	2 hr	Correct Fault
System Failure Priority 1	Yes/No	Yes	1 hr 2 hr (AH)	Correct Fault
System Failure Priority 2	Yes/No	Yes	3 hr 4 hr (AH)	Correct Fault
System Failure Priority 3	Yes/No	Yes	1 Working Day	Correct Fault
System Failure Priority 4	Yes/No	Yes	1 Week	Correct Fault
Personal Complaints	Yes/No	Yes	5 Working Days	Investigate & correct fault
Written Complaints	Yes/No	Yes	5 Working Days	Investigate & correct fault

System Failure Priority level is used to determine the response time to particular faults and is defined as;

Priority 1 - a failure to maintain continuity or quality of supply to a large number of customers or to a critical user at a critical time.

Priority 2 - a failure to maintain continuity or quality of supply to a small number of customers or to a critical user at a non critical time.

Priority 3 - a failure to maintain continuity or quality of supply to a single customer.

Priority 4 - a minor problem or complaint, which is dealt with at a time convenient to the customer and the Council.

Response time is defined as the time to have staff on site, to commence rectification of the problem after notification by public or own staff.

4.1.7 Performance Monitoring

The following table describes the way in which each asset group is monitored:

Asset Group	Performance Monitoring Activities
Filtration Plants	Telemetry, Inspections, Complaints, Legislative Compliance
Pump Stations	Telemetry, Inspections, Complaints, Legislative Compliance
Reservoirs	Telemetry, Inspections, Complaints, Legislative Compliance
Reticulation	Inspections, Complaints, Legislative Compliance

Telemetry

The object of the telemetry system is to provide a continuous flow of data including flow rates, pumping times (cut in/cut out), faults etc so that Council can better assess the adequacy, capacity and efficiency of its water supply network.

Inspections

Inspections are designed to identify defects that have the potential to create a risk of damage or inconvenience to the public. The inspections are aligned with the hierarchy and recommend outcomes that may require maintenance or changes to processes. The inspections are designed to highlight and prioritise maintenance works and assist in the planning of future renewals.

Complaints

Complaints are received from users of the asset (consumers) and are used to identify inadequacies and/or inefficiencies in the system. All complaints and resulting actions are recorded, using "Customer Service Request" forms, for future reference and used to aid in the prioritisation of future maintenance works.

Legislative Compliance

There are certain conditions relating to the operation of the water supply asset that Council must comply with by law. Compliance with these conditions ensures that the system is operating to a minimum required standard.

These activities identify inadequacies within the water supply infrastructure and are used to identify and prioritise maintenance and future works requirements.

4.1.8 Consultation Process

This section indicates the level of consultation undertaken by CTW in an effort to gain feedback about the water supply assets.

Public consultation is/will be undertaken through the following processes:

- Best Practice
- Special interest groups/stakeholders (regulatory bodies)
- Consumer surveys
- Public forums at bi-monthly Council meetings
- Complaints

The outcomes of these forms of consultation are used to identify and prioritise future works. They also serve as a conduit for information transfer between CTW and the community at large. They give the council and the public the opportunity to discuss issues regarding the asset.

Generally the bulk of the consultation comes through complaints and via public display of policy documents. Public meetings are held to discuss major changes to the asset.

4.1.9 Boundary Issues

CTW's water supply network does not extend beyond the three constituent council boundaries, except for a few rural consumers in Bland and Forbes Council areas. It presently covers the townships and villages of Blayney, Millthorpe, Carcoar, Mandurama, Lyndhurst, Somers, Canowindra, Morebel, Cargo, Cudal, Manildra, Eugowra Grenfell and Quandialla.

Bulk water is also supplied to Cowra Shire for the villages of Gooloogong and Woodstock and Pierce's rural scheme.

4.1.10 Council Ownership Functions

This section refers to the use of contractors and contractual arrangements undertaken by Council. Currently there are no contractual arrangements between Council and a contractor aside from minor day-to-day works as required.

4.2 Asset Group 1 – Filtration Plant

The purpose of this section is to outline how Council manages the Water Filtration Plants.

4.2.1 Objective

Council's objective in owning and providing Water Filtration Plants is to provide a potable water supply to the community.

The Water Filtration Plants treat raw water pumped from Lake Rowlands on the Coombing Creek and supply potable water to the town and villages, via trunk mains, through pump stations, reservoirs and reticulation pipelines.

4.2.2 Background Data

CTW operates two Water Filtration Plants at Carcoar and Blayney.

The Carcoar Water Filtration Plant, located on Fell Timber Road., is Dissolved Air Flotation Filter (DAFF) plant commissioned in 2002 with design capacity 9 ML/day.

The Blayney Water Filtration Plant located on Hills Lane, is conventional sand filter plant constructed in 1966 with design capacity of 6 ML/day.

The Gooloogong groundwater supply system, which supplements water from Lake Rowlands in extreme peak demand periods, a chlorine disinfection system, There are two bores at Gooloogong, No.1 was constructed in 1993 and No. 2 was constructed in 1987.

The **Carcoar** WFP consists of the following main facilities.

- Filtered water pumping station
- Chemical dosing pit
- Six settling lagoons
- Settled water pumping station
- Two rapid gravity sand filters and associated pumps and air scour blower for filter backwashing
- Clear water tank and pumping station
- Chemical dosing facilities to meter alum, polyelectrolyte, chlorine, fluoride and powder activated carbon
- Compressed air facilities

Raw water gravitates from Lake Rowlands and treated water gravitates via trunk mains to reservoirs and the reticulation system.

The Blayney WFP consists of the following main facilities.

- Chemical dosing pit
- Three settling lagoons
- Four gravity sand filters and associated pumps and air scour blower for filter backwashing
- Clear water tank and pumping station
- Chemical dosing facilities to meter alum, polyelectrolyte, chlorine, fluoride and powder activated carbon
- Compressed air facilities

Raw water is pumped from Lake Rowlands and treated water gravitates via trunk mains to reservoirs and the reticulation system.

The **Gooloogong** groundwater system consists of the following facilities.

- Chlorination unit, pump station building and reservoir.

The chlorination unit and pump station building are adjacent to the reservoir and treats the raw water as it is pumped into the reservoir.

Overview

Some of the key life-cycle issues that affect the Water Filtration Plants are:

- Condition of system
- Scheduled maintenance
- Condition based maintenance and monitoring including regular maintenance
- Works needed to meet Level Of Service
- Community concerns
- The age of the Asset
- System Operating Rules
- Operating Procedures per facility
- Operational efficiency – Energy

Hierarchy

The Water Filtration Plants are classified using the following hierarchy:

Buildings
Raw water supply
Chemical pre-dosing
Clarification and settled water pumping
Filtration
Clear water storage and pumping
Air scour/backwash facilities
Backwash recovery and residuals disposal
Chemical handling, metering and dosing equipment
Compressed air system
Building services water system
Sampling arrangements
Plant control and instrumentation

Asset Performance

The Water Filtration Plants are monitored using the following techniques:-

- Telemetry
- Inspections
- Complaints
- Legislative Compliance

Council's Integrated Water Cycle Management Plan (IWCM) has identified that the two Water Filtration Plants and Gooloogong groundwater system have adequate capacity to supply the future demands of CTW for at least the next twenty years.

Maintenance Expenditure Forecasts

Considerations include:

- Water Filtration Plant maintenance costs will increase if the water supply network grows in size and flow volumes increase.
- Historical costs have been between \$173,000 and \$187,000 over the last five years.

The 30-year financial plan allows for a relatively constant operation and maintenance costs of \$570,000 per annum, over the whole water supply system. Any increase in costs due to the ageing of the system will be offset by staged replacement of deteriorating and therefore high maintenance components.

4.2.3 New Works Strategies

Subdivision and capacity driven development

All the Filtration Plants have ample capacity to accommodate any increased load due to new subdivisions, or other developments for the foreseeable future.

New Works Expenditure Forecasts

The 30 Year Financial Plan indicates that \$0.7 million will be spent on an upgrade to the Blayney Water Filtration Plant in 2014/2015 and \$1.4 million on an upgrade to Carcoar Water Filtration Plant in 2020/2021. No new capital works are planned.

4.3 Asset Group 2 – Pump Stations

The purpose of this section is outline how Council manages the Pump Stations associated with the water supply reticulation system.

4.3.1 Objective

Council's objective in owning and providing Pumping Stations is to provide a water supply system/service to the community.

The water reticulation system supplies potable water to households, commercial and public premises through a network of pipelines that include storage reservoirs and pump stations.

4.3.2 Background Data

CTW operates two independent water supply systems, Lake Rowlands and Quandialla and operates 32 pump stations across the two systems with a total capacity of 26ML/day.

Overview

Some of the key life-cycle issues that affect the Pump Stations are:

- Condition of Pump Station
- Scheduled maintenance
- Condition based maintenance and monitoring including regular maintenance
- Works needed to meet Level Of Service
- Community concerns
- The age of the Asset
- System Operating Rules
- Operating Procedures per facility
- Operational efficiency – Energy

Hierarchy

The pumping stations group is classified using the following hierarchy:

Civil Structure, including wells and bores

Mechanical Components, including pumps, valves and pipe work

Electrical Components, including switch gear, safety equipment and telemetry

Asset Performance

The Pumping Station is monitored using the following techniques:-

- Telemetry
- Inspections
- Complaints
- Legislative Compliance

All the pump stations have adequate capacity to supply present and future forecast demand.

4.3.3 Operations

Operational activities should be explained incorporating the impacts of the operations on the assets.

Operational activities for Pump Station relate to the following:

- Sequence to perform particular tasks
- Priming and starting procedures
- In-service operational checks
- Routine test/operational procedures
- Procedure for engaging stand-by pump
- Resetting procedure
- Procedure for using temporary equipment

All water pump stations are automatic in operation and generally unattended. To ensure reliable and cost-effective operation of these pump stations, an on-going program of systematic inspections, preventative maintenance and equipment overhaul is necessary.

Hierarchy Pump Station	Inspection frequency (weeks)
Work area free from rubbish and obstructions	Weekly
Surface areas safe and suitable	Weekly
Cut/mow grass	As necessary
Operate 'off duty' pump	As per operation manual

4.3.4 Maintenance

Maintenance work is the day-to-day work required to maintain the asset's ability to provide the required service levels

Work Definition

In the case of pump station assets, maintenance affects mechanical, electrical and civil aspects and includes:

- Leaks at pump seat, pipe work
- Excessive amp draw, vibration, irregular noise, overheating
- Valve malfunction

General maintenance strategies include:

- Carry out systematic inspection of plant/equipment to detect and correct problems before they develop into costly major repairs, or replacements.
- Ensuring the pumping station is maintained to deliver the desired levels of service.

Maintenance work is carried out by Council's own employees.

Maintenance Expenditure Forecasts

Considerations include:

- Pump station maintenance costs will increase if the water supply network grows in size and flow volumes increase.
- Historical costs have been between \$56,000 and \$66,000 over the last five years.

The 30-year financial plan allows for a relatively constant pump station operation and maintenance costs of \$134,000 per annum, over the whole water supply system. Any increase in costs due to the ageing of the system will be offset by staged replacement of deteriorating and therefore high maintenance components.

4.3.5 Renewal

Council's 30 year financial plan has an annual provision of \$41,000 for pump replacement if necessary.

4.3.6 New Works Strategies

Subdivision development

Any new water pump station infrastructure required due to subdivisions is to be provided by the developer at their cost, not council's.

Capacity driven development

Current population projections for the CTW LGA indicate that the current water supply network has adequate capacity for the foreseeable future.

New Works Expenditure Forecasts

There are no further pump stations being planned in the near future. Refurbishment of Gooloogong Bore is planned for 2021/2022 at an estimated cost of \$780,000.

4.3.7 Disposal

There is currently no policy to dispose of water supply assets within CTW's boundaries and it is not expected that any water pump stations will need to be disposed of in the foreseeable future.

4.4 Asset Group 3 – Reservoirs

The purpose of this section is outline how Council manages the reservoirs associated with the water supply reticulation system.

4.4.1 Objective

Council's objective in owning and providing reservoirs is to provide a water supply system/service to the community.

The water reticulation system supplies potable water to households, commercial and public premises through a network of pipelines that include storage reservoirs and pump stations. The reservoirs store treated water to

provide relatively constant water pressure to the reticulation system and also provides a reserve supply in case of Filtration Plant or pump station failure.

4.4.2 Background Data

CTW operates two independent water supply systems, Lake Rowlands and Quandialla and has 46 service reservoirs across the two systems with a total capacity of 29.6ML.

Overview

Some of the key life-cycle issues that affect the reservoirs are:

- Condition of Reservoirs
- Scheduled maintenance
- Condition based maintenance and monitoring including regular maintenance
- Works needed to meet Level Of Service
- Community concerns
- The age of the Asset
- System Operating Rules

Hierarchy

The reservoir group is classified using the following hierarchy:

Civil Structure

Mechanical Components, including valves and pipe work

Electrical Components, including telemetry

Asset Performance

The Reservoirs are monitored using the following techniques:-

- Telemetry
- Inspections
- Complaints
- Legislative Compliance

All the reservoirs have adequate capacity to supply present and future forecast demand.

4.4.3 Operations

Operational activities should be explained incorporating the impacts of the operations on the assets.

There are minimal operational activities required for the efficient operation of reservoirs as most are performed automatically via the telemetry system. The operational activities that are carried out relate to the following:

- Sequence to perform particular tasks
- In-service operational checks
- Routine test/operational procedures
- Procedure for using temporary equipment

All water reservoirs are automatic in operation and unattended. To ensure reliable and cost-effective operation of these reservoirs, an on-going program of systematic inspections, preventative maintenance and equipment overhaul is necessary.

4.4.4 Maintenance

Maintenance work is the day-to-day work required to maintain the asset's ability to provide the required service levels

Work Definition

In the case of reservoir assets, maintenance affects mechanical, electrical and civil aspects and includes:

- Leaks from reservoirs
- Telemetry malfunction
- Valve malfunction

General maintenance strategies include:

- Carry out systematic inspections to detect and correct problems before they develop into costly major repairs, or replacements.
- Exercise valves to ensure free movement.

Maintenance work is carried out by Council's own employees.

Maintenance Expenditure Forecasts

Considerations include:

- Reservoir maintenance costs are not influenced by flow volumes but are influenced more by the age of the asset as frequency of leaks increase.
- Historical costs have been between \$25,000 and \$41,000 over the last five years.

The 30-year financial plan allows for a relatively constant operation and maintenance costs of \$25,000 per annum, over the whole water supply system. Any increase in costs due to the ageing of the system will be offset by staged replacement of deteriorating and therefore high maintenance components.

Reservoir Expenditure Forecasts

The selection of the reservoirs to be refurbished or replaced is based on condition as outlined above.

The 30-year Financial Plan has provided \$4.9 million reservoir upgrades or replacement in 2036/2037.

4.4.5 New Works Strategies

Subdivision development

Any new reservoirs infrastructure required due to subdivisions is to be provided by the developer at their cost, not council's.

Capacity driven development

Current population projections for the CTW LGA indicate that the current water supply network has adequate capacity for the foreseeable future.

4.5 Asset Group 4 – Trunk & Reticulation Mains

The purpose of this section is to outline how Council manages the water supply trunk and reticulation mains system.

4.5.1 Objective

Council's objective in owning and providing a water supply trunk and reticulation mains system is to provide potable water to households and commercial users. The water is supplied from reservoirs, pump stations or directly from the water Filtration Plant.

4.5.2 Background Data

CTW has two independent water supply systems, Lake Rowlands and Quandialla.

The system is comprised of a network of trunk and reticulation mains including cast iron, asbestos cement, DICL, PVC and Polythene pipes. The majority of the unlined cast iron mains have been replaced with UPVC and the remaining unlined cast iron pipes in line with CTW's annual renewal programme.

Overview

Some of the key life-cycle issues that affect the Water Supply Reticulation system are:

- Condition of system
- Scheduled maintenance
- Condition based maintenance and monitoring including regular maintenance
- Works needed to meet Level Of Service
- Community concerns
- The age of the Asset
- System Operating Rules

Hierarchy

The reticulation group is classified using the following hierarchy:

Reticulation Mains	Reticulates water through the town or village. They include isolation valves and hydrants, Customer services are connected to these mains. Flow direction can change and is dependent on demand.
Trunk Mains	Carries water from reservoirs, pump stations or Filtration Plant to the reticulation mains. The pipes are generally larger than those for reticulation and the flow is normally in the one direction. Hydrants are not usually connected to these mains.

Asset Performance

The reticulation system is monitored using the following techniques:-

- Telemetry
- Inspections
- Complaints
- Legislative Compliance

The current trunk and reticulation systems are adequate to supply current peak demand and the location of reservoirs reduces the likelihood of pressure fluctuations.

Data has been collected to assess the future requirements/demand that will be placed on the reticulation system and this indicates that it is adequate for the foreseeable future.

4.5.3 Operations

Operational activities should be explained incorporating the impacts of the operations on the assets.

Operational activities for trunk and reticulation relate to the following:

- The location of assets, in particular major/important trunk or reticulation mains,
- Relevant details of catchment areas and/or potentially sensitive areas that may cause problem,
- The number of customers affected in each of the areas, including major contributors to the area,
- Level of response and procedures for attending to emergencies.

Inspections are undertaken as leaks or breaks in the line occur.

4.5.4 Maintenance

Maintenance work is the day-to-day work required to maintain the asset's ability to provide the required service levels

Work Definition

In the case of reticulation assets, maintenance affects both mains and customer services, and includes:

- Breaks
- Leaks
- Hydrant and valve leaks
- Illegal connections

General maintenance strategies include:

- Deferring minor maintenance work if mains are due for upgrading or replacement.
- Ensuring the network is maintained to deliver the desired levels of service.
- Attending to after-hour call-outs.

Maintenance works are carried out by Council's own employees.

Maintenance Expenditure Forecasts

Considerations include:

- Trunk and reticulation maintenance costs will increase if the water supply network grows in size and flow volumes increase.
- Historical costs which have been \$292,000 to \$300,000 over the last five years.

The 30-year financial plan allows for a relatively constant operation and maintenance costs of \$371,000 per annum, over the whole water supply system. Any increase in costs due to the ageing of the system will be offset by staged replacement of deteriorating and therefore high maintenance components.

4.5.5 Renewal

Reticulation Renewal Expenditure Forecasts

The 30-year Financial Plan has provided \$14.5 million for reticulation renewals in various locations across the network.

4.5.6 New Works Strategies

Subdivision development

Any new water reticulation infrastructure required due to subdivisions is to be provided by the developer at their cost, not council's.

Capacity driven development

Current population projections for the CTW LGA indicate that the current reticulation network has adequate capacity for the foreseeable future.

New Works Expenditure Forecasts

The 30 year financial plan provides for the renewal and upgrade of Council's trunk main system, outlined as follows:

- Renewal of Trunk Main 'K' Gooloogong to Grenfell, 35.325 kilometres, \$5.97M – commencing 2013. Current condition poor. To be upsized from 200mm to 250mm.
- Renewal of Trunk Main 'U' from Trunk Main 'C' to Cudal, 33.8 kilometres, \$3.38M – commencing 2016. Current condition poor. To be upsized from 150mm to 200mm.
- Renewal of Trunk Main 'C' Mandurama to Gooloogong, 72.92 kilometres, \$12.20M – commencing 2021 to 2025. Current condition poor. To be upsized from 225/250mm to 300mm.
- Renewal of Trunk Main 'B' Carcoar Filtration Plant to Mandurama, 6.575 kilometres, \$1.12M – commencing in 2022. Current condition fair. To be upsized from 250mm to 300mm.
- Renewal of Trunk Main 'D' Carcoar Filtration Plant to Browns Creek, 19.7 kilometres, \$2.81M – commencing in 2026. Current condition fair. To be upsized from 200mm to 250mm.
- Renewal of Trunk Main 'A' Lake Rowlands to Carcoar Filtration Plant, 4.5 kilometres, \$1.46M – commencing in 2028. Current condition fair. To remain at 375mm.
- Renewal of Trunk Main 'F' Browns Creek to Millthorpe, 8.325 kilometres, \$0.84m – commencing in 2026. Current condition fair. To be upsized from 150mm to 200mm.
- Renewal of Trunk Main 'P' from Trunk Main 'C' to Somers, 3.387 kilometres, \$0.17M – commencing in 2026. Current condition fair.
- Renewal of Trunk Main 'X' Lake Rowlands to Blayney, 14.94 kilometres, \$3.49M – commencing in 2034. Current condition fair. To remain at 375/300mm.

4.5.7 Disposal

There is currently no policy to dispose of trunk or reticulation mains within CTW's boundaries. The water mains that are being replaced are being decommissioned by isolating from the network and left in place.

Appendix A – Operations Management Plan

OPERATION MANAGEMENT PLAN

Central Tablelands *Water*



September 2013

OPERATIONS MANAGEMENT PLAN

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1. INTRODUCTION

This Operations Management Plan for Central Tablelands Water outlines the operation of CTW assets in a manner which economical provides acceptable levels of service to our customers through the:

- Setting of operational objectives and monitoring procedures,
- Preparation of proper operating procedures and their utilisation at CTW facilities,
- Identification of system deficiencies and constraints and thus determining Operating Rules,
- Efficient use of water resources, and
- Ensuring that the scheme's operating methods minimise adverse environmental impacts.

The Plan includes:

- A description and history of the CTW system,
- The objectives of Operations Management and target Levels of Service,
- An overview of system operation,
- Operating parameters of facilities within each Sub-Systems,
- System operating rules in general and for Normal, Peak Demand, Abnormal (breakdown) and Disaster operating conditions.

This document also forms part of CTW's Asset Management Plan, developed as part of the Total Asset Management approach to the provision of water supply services. This plan will enable CTW to meet service standards, to increase the system's operating efficiency and to more effectively invest capital in assets to provide services that will meet future needs.

2. SYSTEM DESCRIPTION

The overall scheme (known as the A/D system) is an interconnected network of sub-systems, which are primarily fed from Lake Rowlands. In peak periods, supply is supplemented from additional sources such as Gooloogong Bore, Bangaroo Bore and Cudal Bore.

The scheme supplies water to a significant area of central New South Wales, including towns and villages in the shires of Blayney, Cabonne, Cowra and Weddin.

The scheme is a long, linear system that is now under stress due to its limited transfer capacity and aging components, rendering it vulnerable to breakdown problems and complex operation.

For the purposes of this document, the system is divided into the following sub-systems:

Blayney - Carcoar - Millthorpe system:	Sub-System 1
Blayney Shire villages:	Sub-System 2
D-Section (from Trunk Main 'C' to Manildra):	Sub-System 3
Canowindra System:	Sub-System 4
Bangaroo Bore:	Sub-System 5
Gooloogong Bore:	Sub-System 6
Eugowra System:	Sub-System 7
Grenfell System:	Sub-System 8
Quandialla System:	Sub-System 9

The main source of supply is Lake Rowlands, which was constructed in the late 1940's. There are two trunk mains drawing water from Lake Rowlands. One of these is a 375mm gravity main to Carcoar Water Filtration Plant, which originally serviced the whole system. The other pipeline is a 300/375mm rising main to Blayney Water Filtration Plant. This section was constructed in 1966 to provide an increased supply to Blayney and to allow the output from the Carcoar Water Filtration Plant to feed the rest of the system.

The A/D section, completed in the 1950's, was a gravity system fed from the Carcoar Water Filtration Plant. In 1961, booster stations were installed at Gooloogong and Canomodine to maintain supplies at the extremities of the system. In 2003, booster stations were installed on Trunk Main 'C' at Newry Downs and Sugarloaf Road to increase flows to the western end of the system.

Bogolong Dam, built in 1930, was maintained as a backup emergency supply. It was taken out of operation in 2000.

In 1968 a bore field at Bangaroo was commissioned to feed the Western end of the system, further reducing the demand on Carcoar Water Filtration Plant. Further development of ground water resources took place in 1977 when the Gooloogong Bore was commissioned. It was proposed that Bangaroo Bore could supplement supply to Canowindra, and indirectly to D-Section, while Gooloogong Bore could supplement supply to Grenfell or Eugowra. A standby bore was installed at Gooloogong in 1987 to provide security for that system.

The bores at Cudal and Blayney Well have also been added to the system. They are maintained as stand-by facilities, used only during peak demand periods. The Quandialla

section, built in 2002, is a stand-alone system, which supplies the Quandialla Township and rural customers from a bore via a 100mm rising main.

This development of additional water resources throughout the system has allowed supply to be increased generally in line with demand, without being completely restricted by the limited transfer capacity of the original system.

3. OPERATIONS MANAGEMENT AND LEVELS OF SERVICE

Central Tablelands Water's Operations Management objectives relate to the use of component assets to deliver bulk water to customers in an economical manner. CTW however must operate with environmental responsibility and meet consumer needs for service and reliability.

3.1 WATER QUALITY

Objective:

- Meet or exceed guidelines for water quality at point of sale set by National Health and Medical Research Council (NHMRC) and Australia Water Resources Council (AWRC).

Levels of Service:

For microbiological quality;

Faecal Coliforms	100% of routine samples to have zero e-coli per 100ml of water.
Coliforms	98% of routine samples to have zero coliforms per 100ml of water; no sample to have more than 10 coliforms per 100ml of water.

For physical and chemical quality the guidelines specify a series of recommended values. The guidelines also state:

"In general, the physical characteristics of water are not of direct public health concern, but they do affect the aesthetic quality of the water. The guideline for each... chemical is the concentration that... does not result in any significant risk to the health of the consumer. The health related guideline values are very conservative.... The physical guideline values should not be regarded as absolute, but as value judgments. Consequently small, short-term excursions beyond a guideline value do not necessarily mean that the water will be unacceptable."

100% compliance with the guideline values is unrealistic and is not achievable without complete treatment of all water sources. 90% compliance is considered to be more realistic and generally acceptable to consumers. With this in mind, the following levels of service have been adopted.

Colour	100% of samples to be 10 HU or less 90% of all samples to be 3 HU or less
Turbidity	100% of samples to be 1 NTU or less 90% of all samples to be 0.2 NTU or less
Iron	100% of samples to have 0.2 mg/L or less
Manganese	100% of samples to have 0.1 mg/L or less

Note: It must be recognised that the ability to control chemical and physical parameters such as iron and water colour is limited.

The current water quality monitoring program is detailed in Table 1.

Table 1: Water Quality Monitoring Schedule.

Type of Analysis	Frequency	Sampling Points
Pesticide	Annually	All sources of raw water
Comprehensive chemical	Annually	All reticulation networks
Routine chemical	Six-monthly	All reticulation networks
Residual Fluoride	Weekly	Blayney, Lyndhurst, Mandurama and Manildra reticulations
Residual Chlorine	Weekly	Blayney, Lyndhurst, Mandurama, Grenfell, Eugowra and Manildra reticulations
Microbiological	Populations > 2000 - Weekly Populations > 1000 - Fortnightly Populations < 1000 - Monthly	All reticulation networks
Fluoride	Daily	Blayney and Carcoar WFP's
Chlorine	Daily	Blayney and Carcoar WFP's
pH	Daily	Blayney and Carcoar WFP's
Turbidity	Daily	Blayney and Carcoar WFP's
Iron	Weekly	Blayney and Carcoar WFP's
Manganese	Weekly	Blayney and Carcoar WFP's

3.2 PROCEDURE FOR COLLECTING WATER SAMPLES FOR ANALYSIS AT THE LABORATORY

The collection and submission of water samples will be undertaken in accordance with the Forensic and Analytical Science Service (FASS) 2010, Guide for Submitting Water Samples to the Division of Analytical Laboratories for Analysis 2nd Edition. NSW Health and the companion document, Guide for Submitting Water Samples to the Division of Analytical Laboratories for Analysis – Quick Reference Guide which can be found at www.health.nsw.gov.au/environment/water/Documents/dal_analysis.pdf

The Quick Reference Guide provides a summary of the more detailed information set out in the Guide for Submitting Water Samples to the Division of Analytical Laboratories for Analysis. A copy outlining the procedure for collecting and submitting water samples to the Division of Analytical Laboratories is attached at Appendix 1.

The following monitoring and testing programs are recommended for the water supply systems of CTW:

Daily

Samples of the raw and final water at CTW Filtration Plant, testing by operators for the following:

- pH
- Apparent colour
- Free Chlorine
- Fluoride
- Temperature

Weekly

CTW operators collect samples from around reticulation systems of Blayney, Millthorpe, Carcoar, Mandurama, Lyndhurst and Trunk Main 'H', and is tested by CTW operators for the following:

- pH
- Apparent colour
- Turbidity
- Free Chlorine
- Fluoride
- Iron
- Manganese
- Aluminium Residuals

Lake Rowlands

- Iron
- Manganese

Fortnightly

CTW operators collect samples from Lake Rowlands inflow streams, and is tested by CTW operators for the following:

- Ammonia
- Chloride
- Nitrate
- pH
- Apparent Colour
- Alkalinity

Weekly/Monthly

CTW operator collects samples from CTW systems and sends to Division of Analytical Laboratories

Testing for MIB & Geosmin (summer months only)

Samples of raw and filtered water and backwash water from sludge lagoons at Water Filtration Plants may be collected by the WTP Operator to be tested for methylisoborneol (MIB) and geosmin.

AWT at the Australian Water Quality Centre in Adelaide can test for MIB & Geosmin

3.2 WATER QUANTITY

Objectives:

- Ensure availability of supply to meet peak daily demand levels for individual towns and villages.
- Ensure availability of supply to meet Council's obligations to Cowra Shire under the agreement to supply water.
- Ensure availability of supply to meet peak daily demand levels for industry.

Levels of Service:

- The peak daily demand requirements of each town and village are as set out in Table 2.
- The peak daily demand of each major industrial consumer is as set out in Table 3.

Table 2: Peak Daily Demands for Towns and Villages.

Town or Village	Peak Demand (ML/day)
Blayney	1.7
Canowindra - Moorbel	2.2
Carcoar	0.2
Cargo	0.3
Cudal	0.4
Eugowra	1.3
Gooloogong (Cowra Shire)	0.1
Grenfell	2.3
Lyndhurst	0.2
Mandurama	0.1
Manildra	0.6
Millthorpe	0.5
Pierces Scheme (Cowra Shire)	0.1
Rurals	4.3
Somers	0.1
Trajere	0.1
Woodstock (Cowra Shire)	0.6

Table 3: Peak Daily Demands for Major Industrial Consumers.

Industry	Peak Demand (ML/day)
Friskies Pet Care	0.3
Western White Linen	0.1
Manildra Flour Mills	0.2
Baiada Poultry	0.3

3.3 RELIABILITY OF SUPPLY

Objectives:

- Ensure agreed targets for planned and unplanned interruptions to consumers are not exceeded.
- Meet target levels of service for water restrictions.

Levels of Service:

- Formal water restrictions not to exceed 10 days during the summer season.
- Table 4 sets out the maximum duration of unplanned interruptions to supply.
- Table 5 shows the service priorities and response times for water supply interruptions.

Table 4: Target maximum duration of interruptions in supply to consumers.

Consumer	Circumstance	Target duration of supply interruption
Major Industrial	Planned	8 hours: each 7 days
	Unplanned	6 hours: each 7 days
Towns and Villages	Planned	12 hours: each 7 days
	Unplanned	1 - 4 hours: each 3 months
		4 - 8 hours: each 6 months
8 + hours: never		
Minor and On-Line	Planned	10 hours: daily
	Unplanned	12 hours: daily

Note: Interruptions are defined as cessation of supply for more than one hour.

Table 5: Priorities and Response Time to Water Supply Interruption.

Priority	Definition	Causes	Effects	Response Time
1	Failure to maintain continuity or quality of supply to one or more major consumers, a large number of consumers; or any major failure	<ul style="list-style-type: none"> • Main break • Pump station or valve failure 	<ul style="list-style-type: none"> • Major Property damage • Large volume of water wasted • Significant depletion of service reservoir • Major environmental impact • Personal injury or risk to public health 	2 hours (Bh) 3 hours (Ah)
2	Failure to maintain continuity or quality of supply to a number of consumers	<ul style="list-style-type: none"> • Minor main break • Partial valve failure • Leaking connection 	<ul style="list-style-type: none"> • Minor property damage • Minor environmental impact 	4 hours (Bh) 5 hours (Ah)
3	Failure to maintain continuity or quality of supply to a single minor consumer	<ul style="list-style-type: none"> • Leaks from main • Inadequate maintenance of pipes • Partial failure of connections 	<ul style="list-style-type: none"> • Poor pressure or reduced flow • Reduction in aesthetic quality of water (no health risk) • Minimal or no impact on environment 	One working day
4	Minor problem or complaint which can be dealt with at a time convenient to the customer and to CTW	<ul style="list-style-type: none"> • Minor faults at service • Aesthetics of CTW equipment 	<ul style="list-style-type: none"> • No significant effect 	Within 2 weeks

3.4 WATER RESOURCE CONSERVATION

Objectives:

- Carefully manage the region's valuable water supply.

Levels of Service:

- Limit the quantity of unaccounted for water to 8% or less per annum of the delivered.

3.5 ENVIRONMENTAL AND ENERGY MANAGEMENT

Objective:

- Ensure that the Scheme's operating methods do not have any detrimental impact on the surrounding environment.
- Ensure operating methods comply with the requirements of the appropriate Acts.
- To minimise the energy used for pumping.
- To use fuel efficient methods in the operation and maintenance of motor vehicles, plant and equipment.

Levels of Service:

- Zero incidence of non-compliance with Environmental Acts and Licenses.

4. OPERATIONAL OVERVIEW

To facilitate operational analysis and management, the CTW System has been divided into nine Sub-Systems, as shown on the following diagrams.

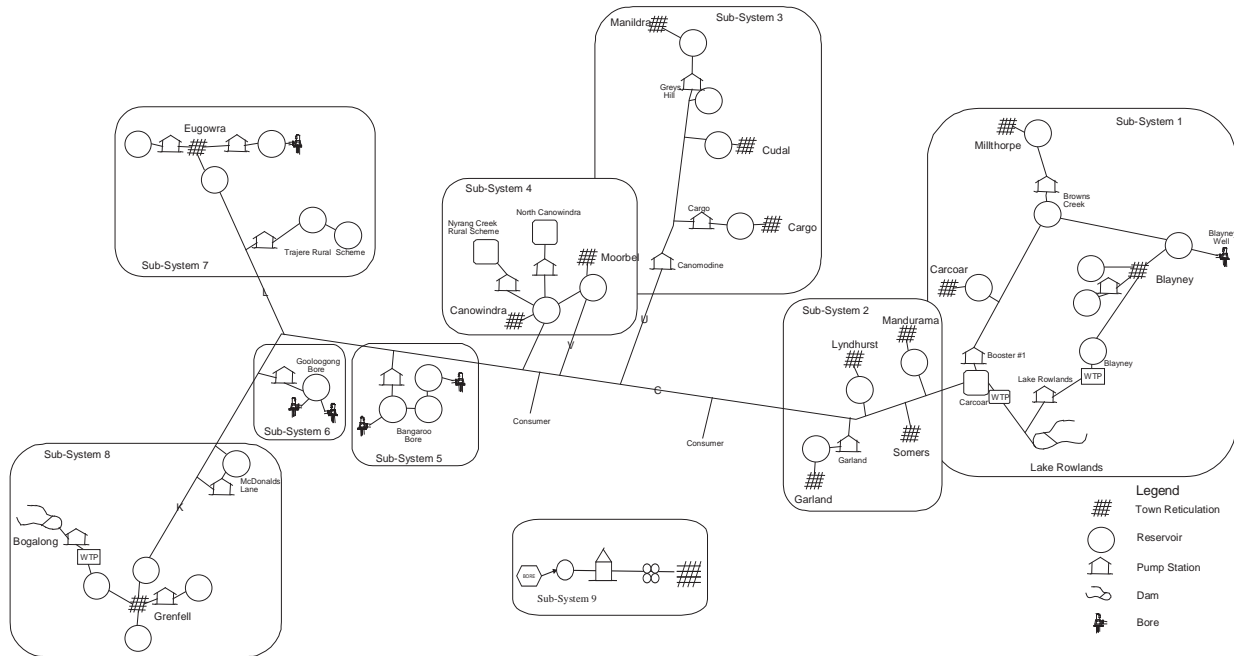


Figure 4.1: The CTW System and its Sub-Systems.

Each Sub-System can conveniently be considered as an operating entity with its own specific performance requirements and operating rules.

The Sub-Systems are:

Blayney - Carcoar - Millthorpe system:	Sub-System 1
Blayney Shire Villages:	Sub-System 2
D-Section (from Trunk Main 'C' to Manildra):	Sub-System 3
Canowindra System:	Sub-System 4
Bangaroo Bore:	Sub-System 5
Gooloogong Bore:	Sub-System 6
Eugowra System:	Sub-System 7
Grenfell System:	Sub-System 8
Quandialla System:	Sub-System 9

Operating parameters in terms of objectives, performance requirements, operating rules, existing capacity, criticality, deficiencies and constraints are described for each of the Sub-Systems.

Criticality for each component of a Sub-System is rated and given a numerical value. This value corresponds with planned maintenance priorities, response times for unplanned

maintenance and the component's importance to the correct operation of the Sub-System and the CTW system as a whole.

Table 6, below, displays the meaning of the each criticality rating.

Table 6: Explanation of Criticality Ratings.

Criticality	Meaning
1	<ul style="list-style-type: none"> • Major (or total) loss of a service or severe impact on a large number of customers. • Failure would cause severe damage to system and/or surrounding property. • Major loss of income or major repairs. • Major impact on levels of service. • Severe public relations or political repercussions.
2	<ul style="list-style-type: none"> • Significant disruption to a service or impact on a large number of customers (may involve a lengthy period of loss of supply). • Failure would cause moderate damage to system and/or surrounding property. • Potential for significant loss of income or expensive repairs. • Significant public relations or political repercussions.
3	<ul style="list-style-type: none"> • Significant inconvenience to a large number of customers involving severe restrictions on services and/or periods of total loss of service. • Failure could cause moderate local impact to both the asset or surrounding area. • Levels of service severely affected. • Moderate public relations or political repercussions.
4	<ul style="list-style-type: none"> • Some inconvenience to a larger group of customers involving restricted or short loss of service and/or moderate impact to surrounding area. • Levels of service moderately affected. • Mild public relations repercussions possible.
5	<ul style="list-style-type: none"> • Minor inconvenience to a small number of customers, minor impact on surrounding area or to levels of service.
6	<ul style="list-style-type: none"> • Lowest importance - negligible impact on surrounding area, levels of service or public relations.

Note: Some facilities are only operated during peak demand periods, which may only be for a few weeks every year. During these periods, the facility may be vital for supply, and so it is given a high criticality rating.

During normal demand periods, which are usually around 90% of the year, these facilities are not needed and so are given a low criticality during these periods.

These stand-by facilities are maintained all year round, ready to operate when needed, due to breakdowns in other parts of the system, for example.

THE CTW SYSTEM

Objective:

To economically deliver water to customers that meets consumer needs for service, quality and reliability and to do so in an environmentally responsible manner.

Performance Requirements:

As stated in 'Levels of Service', Chapter 3.

Existing Facilities:

Raw Water Sources:	Lake Rowlands, Gooloogong Bore, Bangaroo Bore, Cudal Bore, Blayney Well and Quandialla Bore.
Water Filtration Plants:	Blayney and Carcoar.
Services:	5395 (5795 including Cowra Shire bulk supply)
Reservoirs:	45
Pump Stations:	32
Trunk Mains:	295 kilometres.
Reticulation Mains:	264 kilometres
Depots:	Blayney, Canowindra, Cudal and Grenfell.

Capacity:

CTW delivers, on average, a total of 1600 ML/year to its customers.

Criticality:

A reliable supply of clean, healthy water is a fundamental component of sustaining any human population.

CTW is, to nearly all the people living around the system, their sole supply of water. Correct functioning of the CTW system is vital for supplying the various communities and other consumers connected to the system.

Deficiencies and Constraints:

- Age and condition of some mains reduce the transfer capacity of the system.
- During peak demand periods, co-ordination and operation of the various stand-by facilities throughout the system becomes increasingly difficult and complex.
- When the system is stressed to its limit, the safety margins for main breaks decrease with the result that the system becomes less reliable when it is needed most.
- During peak demand periods, several water sources are utilised. This creates varied water quality throughout the system, which, especially in the case of some groundwater supplies, results in complaints from customers due to poor aesthetic quality.

4.1 SUB-SYSTEM 1

Sub-System 1 is the Blayney - Carcaor - Millthorpe system as shown on the diagram below.

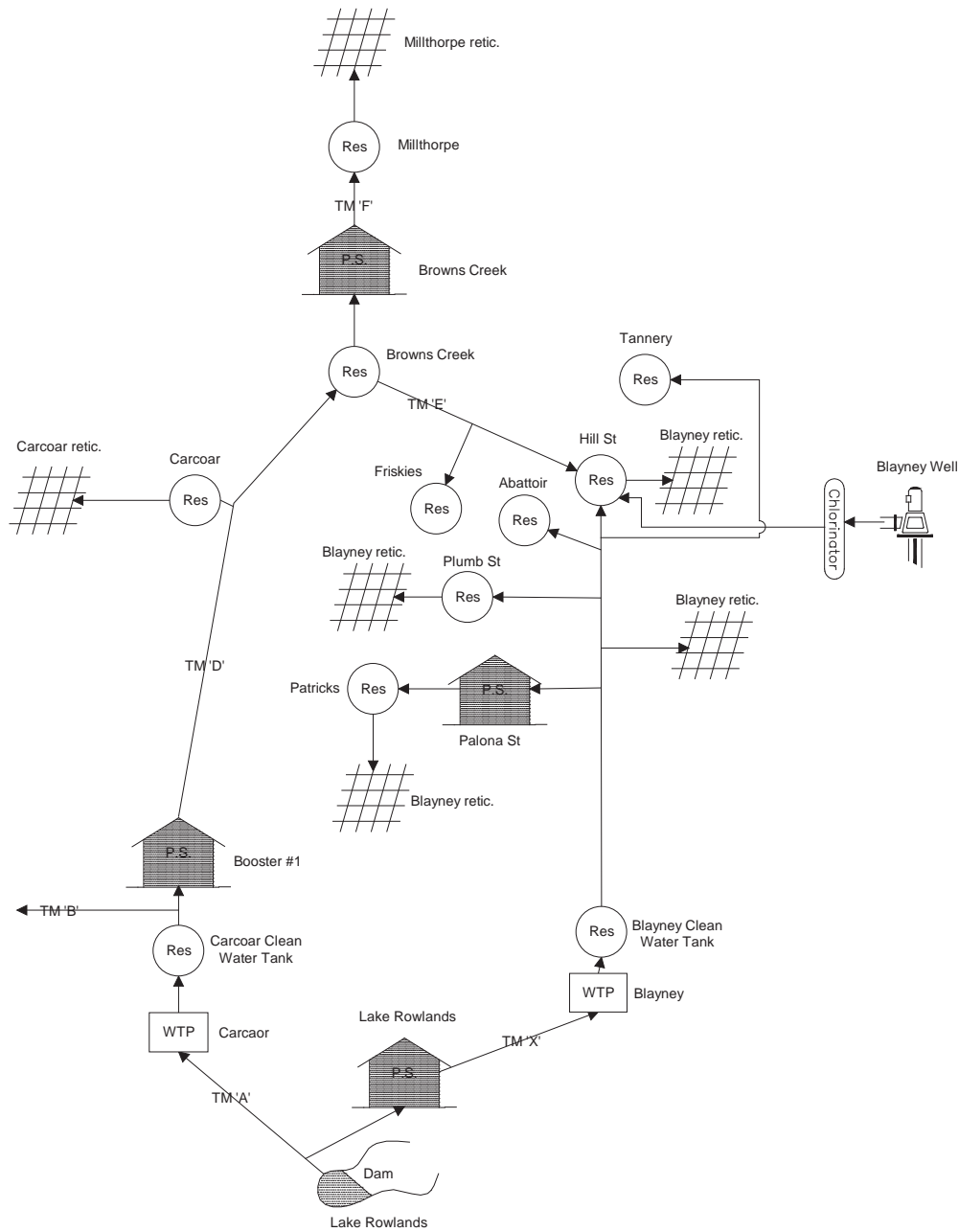


Figure 4.2: Sub-System 1

All the water for Blayney, Carcoar and Millthorpe is supplied from Lake Rowlands. The major part of the water for Blayney is pumped from Lake Rowlands, via Trunk Main 'X', to the Blayney Water Filtration Plant. Treated water is stored in a clear water tank adjacent to the WTP. This reservoir supplies water to the:

- Friskies Pet Care Reservoir;
- Patrick's Reservoir via Polona Street Pump Station;
- Plumb Street Reservoir;
- Hill Street, Blayney Reservoir;
- Browns Creek Reservoir;
- Millthorpe Reservoir via Browns Creek Reservoir.

The remainder of supply for Blayney and all of Carcoar comes from the Carcoar Water Filtration Plant. Water flows, under gravity, from Lake Rowlands to Carcoar WFT, via Trunk Main 'A'. Following treatment, water is stored in the Plant's adjacent clear water tank. From this tank, water is pumped by Booster #1 Pump Station, along Trunk Main 'D'. Carcoar Reservoir is fed off Trunk Main 'D'.

4.1.1 LAKE ROWLANDS

Objective:

To collect, store and supply water.

Performance Requirements:

Safety:	As appropriate for a significant hazard dam.
Average Annual Yield:	1400 ML
Peak Daily Demand:	12 ML
Unplanned Interruptions:	Not more than twice per year.
Water Quality:	As specified in Levels of Service, Section 3 of this document.
Environmental Safeguards:	Maintain a riparian flow of 1.22 - 2.44 ML/day (depending on weather conditions).

Existing Facilities:

The dam is the System's main source of water. The catchment area is rural, the main land use being sheep farming. The dam structure is a combination of an earth and rock fill embankment and concrete slab and buttress wall. Main spillway is over the dam wall with an emergency spillway located north of the wall to prevent the embankment over-topping.

A destratification system prevents dam turnover from causing water quality problems.

The outlet works consist of a valve tower and main. The outlet tower can draw off water from two different levels.

Capacity:

Dam: Volume of 4500 ML
 Catchment Area of 197 km²
 Assessed Safe Yield of 1900 ML/year

Riparian Release: 1.2 - 2.4 ML/day

Outlet Works: Maximum of 12 ML/day

Criticality:

Rating: 1

As the dam is the System's primary source of raw water, the maintaining of Lake Rowlands as a reliable, clean source of supply is of the highest priority. Although the dam has proved a reliable source, an increase in its capacity is proposed so as meet future demands levels and raise security against severe drought.

Deficiencies and Constraints:

- Prone to algal blooms when at low levels.

4.1.2 LAKE ROWLANDS PUMP STATION

Objective:

To boost water from Lake Rowlands to Blayney Water Filtration Plant.

Performance Requirements:

Peak Daily Demand: 6.0 ML/day

Unplanned Interruptions: Not more than 24 hours duration, 4 times in one month.

Existing Facilities:

The Pump Station contains two pumps:

- 2 x Southern Cross 'Sovereign' 125 x 100 x 315 with a 132 kW motor.

The pumps are run individually - never together.

Capacity:

Southern Cross Pump Operation: 6.0 ML/day

Criticality:

Rating: 1

- Lake Rowlands Pump Station is the only means of getting water to Blayney WTP. With two pumps, a complete failure of the Pump Station is unlikely, but would cause major disruption of supply in Blayney.
- If Carcoar was not supplied and the maximum pumping output at Booster #1 was gained, a maximum of 1.4 ML/day could be supplied to Blayney from Carcoar WTP via Trunk Mains 'D' and 'E'.
- Blayney Well, in theory, is capable of delivery 0.6 ML/day. Water quality concerns restrict the operation of Blayney Well to extreme cases of supply deficiency.
- With maximum supply to Blayney and Millthorpe from Carcoar WTP and Blayney Well, 90% of the Peak Daily Demand of 2.7 ML/day could be supplied.

Deficiencies and Constraints:

- None

4.1.3 TRUNK MAIN 'X'

Objective:

To deliver water from Lake Rowlands Pump Station to Blayney WTP.

Performance Requirements:

Peak Daily Transfer: 6.0 ML

Unplanned Interruptions: Not more than four every month.
Not more than 24 hours duration.

Existing Facilities:

- 375mm Cast Iron pipe from 0 km to 1.61 km.
- 300mm AC pipe from 1.61 km to Blayney WTP.
- Total length of 14.94 km.

Capacity:

- Transfer capacity limited by pumping capacity at Lake Rowlands Pump Station and capacity of Blayney WTP to 6.0 ML/day.
- Provisions have been made in the Trunk Main for a possible rise to 9.0 ML/day (with installation of two extra pump stations).

Criticality:

Rating: 1

As for Lake Rowlands Pump Station.

Deficiencies and Constraints:

The Trunk Main is still in good condition, very few breaks occur, but if the main is ever operated at its theoretical maximum transfer capacity of 9.0 ML/day, the margin for failure

due to pressure peaks, for example, will increase. This combined with the loss of strength and reliability due to aging could prove to be a problem in the future.

4.1.4 BLAYNEY WATER FILTRATION PLANT

Objective:

To supply water which meets or exceeds water quality guidelines.

Performance Requirements:

Peak Daily Output: 6.0 ML/day
Unplanned Interruptions: Not more than twice per year.
Not more than two days duration.
Water Quality: As specified in Levels of Service, Section 3.
Environmental Safeguards: As specified in Levels of Service, Section 3.

Existing Facilities:

Water is supplied from Trunk Main 'X' to the mixing chamber. Coagulant and polyelectrolyte are added, it then gravitates to a sedimentation tank, water is decanted off to four rapid sand filters. Filtered water is chlorinated and fluoridated before it is stored in a clear water tank.

Capacity:

6.0 ML/day (possible increase to 9.0 ML/day with extensive modification).

Criticality:

Rating: 1

Reliable supply to Blayney depends on the contribution from Blayney WFP. If Blayney WFP was inoperative, then virtually all treated water for entire system would need to be supplied from Carcoar WFP. During high demand periods, this would prove unfeasible. With groundwater back-up facilities contributing to other parts of the system, a maximum of 1.4 ML/day (of treated water) can be supplied to Blayney from Carcoar WFP. This represents only 84% of Blayney's Peak Daily Demand.

Deficiencies and Constraints:

- The Plant is reliant on signals via the telemetry system, which can be affected by weather conditions.
- The throughput of Blayney WTP is automatically controlled by the telemetry system. Normal operations are predetermined times. There is, however, an emergency override level. If storage reaches this level the pump will start automatically overriding any predetermined times.
- The plant's throughput rate of 6.0 ML/day is limited by the filter media. An increased throughput rate of 9.0 ML/day (in line with upgrades at Lake Rowlands Pump Station and Trunk Main 'X') could be attained by changing the filter material.

4.1.5 POLONA STREET PUMP STATION

Objective:

To deliver water to Patrick's Reservoir.

Performance Requirements:

Peak Daily Demand: 0.22 ML/day

Unplanned Interruptions: Not more than 24 hours duration, twice every month.

Existing Facilities:

Polona Street Pump Station pumps water from the Blayney reticulation system to a reservoir that feeds back into the reticulation.

Pump #1 Kelly and Lewis, Model 70 (reduced impeller diameter) with 18 kW, 31 amp motor.

Pump #2 Kelly and Lewis, Model 70 with 18 kW, 31 amp motor.

Only one pump is run at any one time. Pump #2 is rarely used as a backup.

Capacity:

Pump #1 0.22 ML/day

Pump #2 0.22 ML/day

Criticality:

Rating: 4

Polona Street Pump Station only operates a few hours per day to maintain ample water in Patrick's Reservoir. A breakdown of the pump station would only cause minor disruption to consumers in way of reduced pressure.

Deficiencies and Constraints:

- Stand-by pump requires careful operation.

4.1.6 PATRICK'S RESERVOIR

Objective:

To accept water from Polona Street Pump Station, store it and supply it to the reticulation system in the Southwest area of Blayney.

Performance Requirements:

Peak Daily Input: 0.22 ML/day

Peak Daily Output: 0.22 ML/day

Unplanned Interruptions: Not more than twice every month.
Not more than 24 hours duration.

Existing Facilities:

- 0.45 ML Reservoir (reinforced concrete).
- 100mm inlet - two 50mm overhead feeds.
- 150mm outlet - underneath.

Capacity:

0.45 ML

Criticality:

Rating: 4

The reticulation that the Reservoir feeds to can be supplied from other sources.

Deficiencies and Constraints:

- Only bypass is 25mm.
- No underneath feed capability.

4.1.7 PLUMB STREET RESERVOIR

Objective:

To accept water from Blayney WFP, store it and supply it to the reticulation system in Blayney.

Performance Requirements:

Peak Daily Input: 0.23 ML/day
Peak Daily Output: 0.23 ML/day
Unplanned Interruptions: Not more than twice every month.
Not more than 24 hours duration.

Existing Facilities:

- 0.91 ML Reservoir (reinforced concrete).
- 75mm inlet - overhead feed.
- 150mm outlet - underneath.
- 150mm bypass.

Capacity:

0.91 ML

Criticality:

Rating: 4

The reservoir is easily bypassed so water from Blayney WTP flows directly into the reticulation.

Deficiencies and Constraints:

- None

4.1.8 PLUMB STREET PUMP STATION

Objective:

To accept water from Plumb Street reservoir, pressurise the system bound by Plumb Street/Carcoar Street, Palmer Street, Johnsons Crescent and Trunk Main 'E' to Browns Creek reservoir

Performance Requirements:

Peak Daily Demand: 1.0 ML/day

Unplanned Interruptions: Not more than once in seven days.
Not more than 24 hours duration.

Existing Facilities:

The pump station comprises two pumps.

Pump #1 Southern Cross Starline 125x100x315, 18.5 kw motor

Pump #2 Southern Cross Starline 125x100x315, 18.5 kw motor

Pumps are always run individually – never together.

Capacity:

Operations:

Pump #1 1.0 ML/day

Pump #2 1.0 ML/day

Criticality:

Rating: 5

Plumb Street Pump Station pressurises the north western section of Blayney and supplies water to Browns Creek reservoir.

A breakdown of the pump station would only cause a minor interruption, as water would automatically bypass the pump station and Browns Creek reservoir can be supplied from Booster 1 Pump Station.

Deficiencies and Constraints:

- None.

4.1.9 HILL STREET, BLAYNEY RESERVOIR

Objective:

To accept water from Blayney WFP, Browns Creek Reservoir and Blayney Well, store it and supply it to the reticulation system in Blayney.

Performance Requirements:

Peak Daily Input: 1.4 ML/day
Peak Daily Output: 1.4 ML/day
Unplanned Interruptions: Not more than twice every month.
Not more than 24 hours duration.

Existing Facilities:

- 1.14 ML Reservoir (reinforced concrete).
- Two 50mm inlets - overhead feed.
- 200mm outlet - underneath.
- 300mm bypass.

Capacity:

1.14 ML

Criticality:

Rating: 3

The reservoir is easily bypassed so water from Blayney WFP or Browns Creek Reservoir flows directly into the reticulation.

Deficiencies and Constraints:

- None.

4.1.10 BLAYNEY WELL

Objective:

To act as an emergency water source to supplement supply to Blayney during extreme conditions.

Performance Requirements:

Peak Daily Output: 0.6 ML/day

Unplanned Interruptions: Must be ready to operate when needed.

Existing Facilities:

- Well structure.
- Surface Pump (Grundfos SP60-6, 11kW, 415 V, 2900 rpm @ 50 Hz)
- Chlorinator (Wallace and Tiernan EA741 'V' Notch)
- Chlorinator Booster Pump (Grundfos 0.55 kW, 4 amp, 240 V, 2750 rpm @ 50 Hz)

Capacity:

Well: 0.6ML/day

Surface Pump: 1.0 ML/day

Chlorinator: Relative to flow (dose at 5 mg/L, at max. well output, is 3 kg/day of chlorine).

Criticality:

Rating: 6

Blayney Well is a stand-by structure that is not normally used but must still be maintained in operating condition.

Deficiencies and Constraints:

- Poor water quality.
- Uncontrolled catchment area.
- Unpredictable water table level.
- High chlorine dosing rate to cope with unknown and varying microbiological content of the water.
- Consumers served off main from Blayney Well to Hill Street, Blayney Reservoir get undiluted water.

4.1.11 TRUNK MAIN 'A'

Objective:

To deliver water from Lake Rowlands to Carcoar Water Filtration Plant.

Performance Requirements:

Peak Daily Transfer: 8 ML

Unplanned Interruptions: Not more than once every month.
Not more than 24 hours duration.

Existing Facilities:

375mm Cast Iron, gravity main from Lake Rowlands to Carcoar WFP is 4.81 km long.

Capacity:

9 ML/day.

Criticality:

Rating: 1

Trunk Main 'A' is the only means of transferring raw water to Carcoar WFP. Therefore, any lengthy break would cause major disruption to the operation of Carcoar WFP, which in turn, affects supply to the towns of Carcoar, Millthorpe, Mandurama, Lyndhurst and all other consumers served by Trunk Mains 'C' and 'U' to as far as Canowindra and Manildra.

Deficiencies and Constraints:

- No booster facilities.
- Transfer capacity is reliant upon available need.

4.1.12 CARCOAR WATER FILTRATION PLANT

Objective:

To supply water which meets or exceeds water quality guidelines.

Performance Requirements:

Peak Daily Output: 9.0 ML/day

Unplanned Interruptions: Not more than twice per year.

Not more than two days duration.

Water Quality: As specified in Levels of Service, Section 3.

Environmental Safeguards: As specified in Levels of Service, Section 3.

Existing Facilities:

Water is supplied from Trunk Main 'A' to a mixing chamber, where a coagulant is added. It then enters a DAF chamber where organic material and alum floc are floated off. Water is filtered to remove any excess, and then pumped to the clear water storage. The treated water is chlorinated and fluoridated prior to entering Trunk Main 'B' and Trunk Main 'D'.

Clear Water Tank: 2.16 ML

Capacity:

9ML/day

Criticality:

Rating: 1

Reliable supply of fully treated water to consumers west and north of Carcoar WFP depends on the contribution from Carcoar WFP.

Under normal conditions, water from Carcoar WFP supplies almost all of the CTW system. If Carcoar WFP was inoperative, then all towns and consumers along Trunk Mains 'B', 'C', 'U', 'D', 'F', 'K' and 'L' which includes the larger centres of Canowindra, Eugowra, Grenfell and Manildra would all be significantly affected.

Groundwater and back-up facilities would need to contribute to western parts of the system. Gooloogong Bore and Bangaroo Bore could supply the Grenfell and Eugowra to Canowindra area. Cudal, Cargo, Manildra and Carcoar would be seriously affected.

Deficiencies and Constraints:

- The throughput of Carcoar WFP is proportional to water levels in Lake Rowlands due to the fact that the main feeding the WFP is a gravity main. A decrease in hydraulic gradient between Lake Rowlands and Carcoar WFP caused by falling water level in Lake Rowlands results in a reduced flow entering Carcoar WFP.

4.1.13 BOOSTER #1 PUMP STATION

Objective:

To deliver water from Carcoar WFP to Trunk Main 'D'.

Performance Requirements:

Peak Daily Demand: 1.6 ML/day

Unplanned Interruptions: Not more than 24 hours duration, 4 times every month.

Existing Facilities:

The Pump Station has two pumps:

Pump #1 Southern Cross ISO 80x50x250, 30kw, 50A motors

Pump #2 Southern Cross ISO 80x50x250, 30kw, 50A motors

The pumps are always run individually - never together.

Capacity:

Pump #1 Operation: 1.6 ML/day

Pump #2 Operation: 1.6 ML/day

Criticality:

Rating: 1

Booster station operation is not critical to the supply of Carcoar but Millthorpe depends on the proper functioning of Booster #1 Pump Station as a backup supply.

Millthorpe is supplied from Browns Creek Reservoir and Pump Station, which is in turn supplied from Plumb Street Pump Station. Booster #1 Pump Station is the alternate supply to Browns Creek reservoir.

Deficiencies and Constraints:

- When Pumps are run, the pump's discharge pressure must not exceed 1000 kpa to supply Trunk Main 'D' or 1200 kpa to supply Browns Creek reservoir.

4.1.14 TRUNK MAIN 'D'

Objective:

To transfer water from Booster #1 Pump Station to Carcoar Reservoir and Browns Creek Reservoir.

Performance Requirements:

Peak Daily Transfer: 1.6 ML/day
Unplanned Interruptions: Not more than 4 times every month.
Not more than 24 hours duration.

Existing Facilities:

200mm Cast Iron main, 19.88 km long.

Capacity:

1.6 ML/day

Criticality:

Rating: 1

Trunk Main 'D' is the only means of moving water to Carcoar.

Extended breakdown of the main would cause major problems for rural customers beyond Carcoar.

Deficiencies and Constraints:

- The main is susceptible breaks under the effects of water hammer when Browns Creek Reservoir is being fed overhead.

4.1.15 CARCOAR RESERVOIR

Objective:

To accept water from Trunk Main 'D', store it and supply it to the reticulation system of Carcoar.

Performance Requirements:

Peak Daily Input: 0.3 ML/day
Peak Daily Output: 0.3 ML/day

Unplanned Interruptions: Not more than once per month.
Not more than 8 hours duration.

Existing Facilities:

- 0.68 ML Reservoir (elevated, reinforced concrete).
- 100mm inlet - single 50mm overhead feed.
- 100mm outlet - underneath.

Capacity:

0.68 ML

Criticality:

Rating: 1

Reservoir can be bypassed - supply from Trunk Main 'D' directly to Carcoar reticulation.

Deficiencies and Constraints:

- None

4.1.16 BROWNS CREEK RESERVOIR

Objective:

To accept water from Plumb Street Pump Station or Trunk Main 'D', store it and supply it to Browns Creek Pump Station.

Performance Requirements:

Peak Daily Input: 1.3 ML/day
Peak Daily Output: 1.3 ML/day
Unplanned Interruptions: Not more than 4 times every month.
Not more than 24 hours duration.

Existing Facilities:

- 0.23 ML Reservoir (reinforced concrete).
- Inlet - single 100mm overhead feed or 150mm underneath feed.
- Outlet - 150mm underneath.

Capacity:

0.23 ML

Criticality:

Rating: 3

Water to Browns Creek Pump Station, and then to Millthorpe, must come from Browns Creek Reservoir.

Browns Creek Reservoir can be bypassed to supply Hill Street, Blayney Reservoir.

Deficiencies and Constraints:

- When being fed from Plumb Street Pump Station, the telemetry system will detect when the reservoir is full, and signal the pumps at Plumb Street Pump Station to stop. The telemetry system relies on electricity.

4.1.17 BROWNS CREEK PUMP STATION

Objective:

To deliver water from Browns Creek Reservoir to Millthorpe Reservoir.

Performance Requirements:

Peak Daily Demand: 0.8 ML/day

Unplanned Interruptions: Not more than 24 hours duration, every week.

Existing Facilities:

The Pump Station is comprised of two pumps.

Pump #1 Southern Cross 80x50x315 with 30 kW, 52 amp motor.

Pump #2 Southern Cross 80 x 50 x 315 with 30 kW, 52 amp motor.

Pumps are always run individually - never together.

Capacity:

Pump #1 Operation: 0.8 ML/day

Pump #2 Operation: 0.8 ML/day

Criticality:

Rating: 1

Supply in Millthorpe depends on the proper functioning of Browns Creek Pump Station as there is no alternative supply for Millthorpe.

Deficiencies and Constraints:

- None

4.1.18 TRUNK MAIN 'E'

Objective:

To transfer water from Plumb Street Pump Station to Browns Creek Reservoir, or to transfer water from Browns Creek Reservoir to Hill Street, Blayney Reservoir.

Performance Requirements:

Peak Daily Transfer: 1.4 ML/day
Unplanned Interruptions: Not more than 4 times every month.
Not more than 24 hours duration.

Existing Facilities:

- 150mm Cast Iron main, 3.15 km long.

Capacity:

1.4 ML/day

Criticality:

Rating: 4

Supply to Hill Street, Blayney Reservoir can be easily obtained from other sources.

Deficiencies and Constraints:

- None

4.1.19 TRUNK MAIN 'F'

Objective:

To transfer water from Browns Creek Pump Station to Millthorpe Reservoir.

Performance Requirements:

Peak Daily Transfer: 0.8 ML/day
Unplanned Interruptions: Not more than once every week.
Not more than 24 hours duration.

Existing Facilities:

- 150mm Cast Iron main, 8.38 km long.

Capacity:

0.8 ML/day

Criticality:

Rating: 1

Trunk Main 'F' is the only means of supplying water to Millthorpe. There is no alternative supply route for Millthorpe.

Deficiencies and Constraints:

- If Millthorpe Reservoir is being fed overhead, the ball/float valve closing when the reservoir is full will cause man failure due to water hammer.

4.1.20 MILLTHORPE RESERVOIR

Objective:

To accept water from Trunk Main 'F', store it and supply it to the reticulation system of Millthorpe.

Performance Requirements:

Peak Daily Input: 0.8 ML/day

Peak Daily Output: 0.8 ML/day

Unplanned Interruptions: Not more than once in seven days. Not more than 24 hours duration.

Existing Facilities:

- 1.36 ML Reservoir (reinforced concrete).
- Inlet - single 50mm overhead feed or 150mm underneath feed.
- Outlet - 150mm underneath.

Capacity:

1.36 ML

Criticality:

Rating: 3

If supply to Millthorpe was interrupted completely and Millthorpe reservoir was full, it would supply Millthorpe's Peak Daily Demand for 48 hours.

Deficiencies and Constraints:

- Nearby customers experience low pressure when reservoir is less than 50% of capacity.

4.2 SUB-SYSTEM 2

Sub-System 2 is the Blayney Shire Villages and Trunk Main 'C' system as shown on the diagram below.

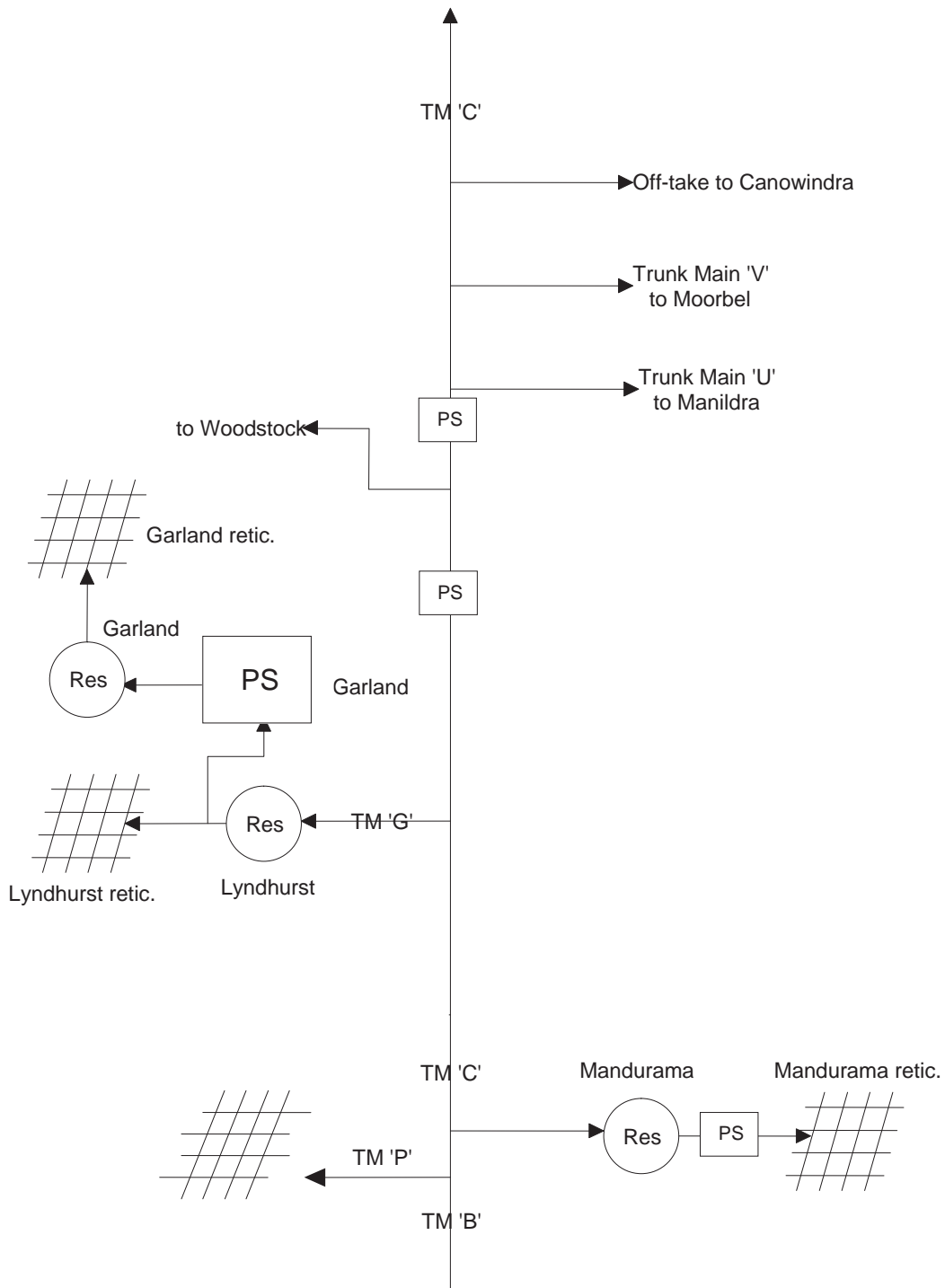


Figure 4.3: Sub-System 2.

Trunk Main 'B' from Carcoar WFP joins Trunk Main 'C' at the Mandurama off-take. Trunk Main 'B' supplies the village of Somers (via Trunk Main 'P'). Trunk Main 'C' then supplies: Mandurama, Lyndhurst and Garland via Trunk Main 'G'. The off-takes of Trunk Main 'U', Trunk Main 'V', Woodstock and Canowindra are also supplied via Trunk Main 'C'.

Under normal conditions all water to Sub-System 2 is supplied from Lake Rowlands via Carcoar WFP and Trunk Main 'B'.

4.2.1 TRUNK MAIN 'B'

Objective:

To transfer water from Carcoar WTP to Trunk Main 'P', Trunk Main 'C' and Mandurama Reservoir.

Performance Requirements:

Peak Daily Transfer: 7.3 ML/day
Unplanned Interruptions: Not more than once every month.
Not more than 24 hours duration.

Existing Facilities:

- 250mm Cast Iron main, 5.45 km long.

Capacity:

7.3 ML/day

Criticality:

Rating: 1

Trunk Main 'B' is the only means of transferring supply from Carcoar WFP to the rest of the system. Lengthy breakdown of this main would therefore cause major disruption in the rest of the system.

Deficiencies and Constraints:

- None

4.2.2 TRUNK MAIN 'P'

Objective:

To transfer water from Trunk Main 'B' to the village of Somers.

Performance Requirements:

Peak Daily Transfer: 0.1 ML/day

Unplanned Interruptions: Not more than 4 times every month.
Not more than 24 hours duration.

Existing Facilities:

- 1.72 km of 100mm AC pipe.
- 1.50 km of 100mm uPVC pipe.

Capacity:

0.1 ML/day

Criticality:

Rating: 5

This main serves only a small number of rural consumers, all of whom have on-site storage.

Deficiencies and Constraints:

- 1.72km of main is 'Italia' AC pipe which has deteriorated and is in quite bad condition. Pressure is regulated via a PRV. A pressure setting of 600kpa is sufficient to maintain the service.

4.2.3 MANDURAMA RESERVOIR

Objective:

To accept water from Trunk Main 'B', store it and supply it to the reticulation system of Mandurama via the Mandurama Pump Station.

Performance Requirements:

Peak Daily Input: 0.1 ML/day
Peak Daily Output: 0.1 ML/day
Unplanned Interruptions: Not more than once in seven days.
Not more than 24 hours duration.

Existing Facilities:

- 0.91 ML Reservoir (reinforced concrete).
- Inlet - single 50mm overhead feed or 100mm underneath feed.
- Outlet - 100mm underneath.

Capacity:

0.91 ML

Criticality:

Rating: 3

Reservoir can be bypassed allowing water to flow directly from Trunk Main 'B' into the Mandurama reticulation system.

Deficiencies and Constraints:

- None

4.2.4 MANDURAMA PUMP STATION

Objective:

To accept water from Mandurama reservoir, deliver it to Mandurama reticulation.

Performance Requirements:

Peak Daily Demand: 0.1ML/day

Unplanned Interruptions: Not more than 24 hours duration, each week

Existing Facilities:

The pump station is comprised of three pumps.

Pump #1	Grundfos SV8-03T, 1.5kw motor
Pump #2	Grundfos SV8-03T, 1.5kw motor
Pump #3	Grundfos SV8-03T, 1.5kw motor

The pumps can be operated individually or run together in series.

Capacity:

Pump #1	0.1ML/day
Pump #2	0.1ML/day
Pump #3	0.1ML/day

Criticality:

Rating 3

The pump station is easily bypassed so water from Mandurama Reservoir flows directly into the reticulation.

Deficiencies and Constraints:

- None

4.2.5 TRUNK MAIN 'C'

Objective:

To transfer water from Carcoar WFP to all CTW consumers west of Mandurama.

Performance Requirements:

Peak Daily Transfer: 7.3 ML/day
Unplanned Interruptions: Not more than once every month.
Not more than 24 hours duration.

Existing Facilities:

225mm Cast Iron main, 0 km to 19.48 km
225mm Steel main, 19.48 km to 35.41 km – 15.93 km
200mm Steel main, 35.41 km to 60.98 km – 25.57 km
250mm Steel main, 60.98 km to 69.64 km – 8.66 km

Capacity:

7.3 ML/day

Criticality:

Rating: 1

Mandurama, Lyndhurst, Garland, Canowindra, Moorbel, Woodstock and all consumers supplied from Trunk Main 'U' rely on water from Trunk Main 'C'. These consumers would all be affected by lengthy breaks on Trunk Main 'C', the magnitude of the disruption depending on the location of the break.

Under normal conditions, Trunk Main 'C' also supplies water to Grenfell, Gooloogong and Eugowra. If supply from Trunk Main 'C' was interrupted, Grenfell, Canowindra and Eugowra could readily be supplied from Gooloogong Bore.

Cudal has the emergency backup supply of Cudal Bore.

Mandurama, Lyndhurst, Garland, Cargo and Manildra have no alternative supply.

Deficiencies and Constraints:

- There is a theoretical shortfall in the pipeline capacity. However, in practice, inability to supply has only been a problem during very high demand periods or in event of main failure.
- Some sections of the main are unreliable and incur relatively frequent breakages.

4.2.6 TRUNK MAIN 'G'

Objective:

To transfer water from Trunk Main 'C' to Lyndhurst Reservoir.

Performance Requirements:

Peak Daily Transfer: 0.4 ML/day

Unplanned Interruptions: Not more than 4 times every month.
Not more than 24 hours duration.

Existing Facilities:

- 100mm uPVC pipe, 2.13 km long.

Capacity:

0.2 ML/day

Criticality:

Rating: 2

Trunk Main 'G' is the only means of supply for Lyndhurst and Garland. A full Lyndhurst Reservoir could supply Lyndhurst and Garland for over 48 hours at peak daily demand. Therefore interruption due to failure of Trunk Main 'G' would only be minor.

Deficiencies and Constraints:

- None

4.2.7 LYNDHURST RESERVOIR

Objective:

To accept water from Trunk Main 'G', store it and supply it to the reticulation system of Lyndhurst and Garland.

Performance Requirements:

Peak Daily Input: 0.4 ML/day
Peak Daily Output: 0.4 ML/day
Unplanned Interruptions: Not more than once in seven days.
Not more than 24 hours duration.

Existing Facilities:

- 0.68 ML Reservoir (reinforced concrete).
- Inlet - single 50mm overhead feed or 100mm underneath feed.
- Outlet - 150mm underneath.

Capacity:

0.68 ML

Criticality:

Rating: 3

Reservoir can be bypassed allowing water to flow directly from Trunk Main 'G' into the Lyndhurst reticulation system and hence through to Garland.

Deficiencies and Constraints:

- None

4.2.8 GARLAND PUMP STATION

Objective:

To deliver water to the Garland Reservoir.

Performance Requirements:

Peak Daily Demand: 0.01 ML/day

Unplanned Interruptions: Not more than 3 days duration, every month.

Existing Facilities:

Garland Pump Station pumps water from the Lyndhurst reticulation system to Garland Reservoir.

Pump: Southern Cross ISO 50x32x160, 3kw, 5.7 amp motor.

Capacity:

Pump Operation: 0.1 ML/day

Criticality:

Rating: 6

Pump only operates for several hours per week. Only extended pump outages would affect supply to Garland.

Deficiencies and Constraints:

- No timer or telemetry control.

4.2.9 GARLAND RESERVOIR

Objective:

To accept water from Garland Pump Station, store it and supply it to the consumers of Garland.

Performance Requirements:

Peak Daily Input: 0.01 ML/day

Peak Daily Output: 0.01 ML/day

Unplanned Interruptions: Not more than once in seven days.
Not more than 24 hours duration.

Existing Facilities:

- 0.045 ML Reservoir (reinforced concrete).
- Inlet - single 50mm overhead feed or 100mm underneath feed.
- Outlet - 100mm underneath.

Capacity:

0.045 ML

Criticality:

Rating: 6

Garland only small consumers.

Deficiencies and Constraints:

- No telemetry monitoring equipment.

4.2.10 NEWRY DOWNS PUMP STATION

Objective:

To accept water from Trunk Main 'C' boost to Sugarloaf Road pump station or boost into Trunk Main 'C'.

Performance Requirements:

Peak Daily Demand: 7.10ML/day

Unplanned Interruptions: No more than 24 hours, four times in one month.

Existing Facilities:

The pump station contains two pumps.

Pump #1: Vogel MP 125. 2/3 with a 250 kW motor

Pump #2: Vogel MP 125. 2/3 with a 250 kW motor

The pumps are run individually – never together.

Capacity:

7.10ML/day

Criticality:

Rating: 3

Newry Downs Pump Station is only operated during summer periods, to boost water to the western end of the system. A breakdown of the pump station would only cause a minor interruption, as water would automatically bypass the pump station.

Deficiencies and Constraints:

- None

4.2.11 SUGARLOAF ROAD PUMP STATION

Objective:

To accept water from Trunk Main 'C' boost to the western end of the system.

Performance Requirements:

Peak Daily Demand: 6.0ML/day

Unplanned Interruptions: No more than 24 hours, four times in one month.

Existing Facilities:

The pump station contains two pumps.

Pump #1: Southern Cross 25x100x315 ISO with a 132kW motor

Pump #2: Southern Cross 25x100x315 ISO with a 132kW motor

The pumps are run individually – never together.

Capacity:

6.0ML/day

Criticality:

Rating: 3

Sugarloaf Road Pump Station is only operated during summer periods to boost water to the western end of the system. A breakdown of the pump station would only cause a minor interruption, as water would automatically bypass the pump station.

Deficiencies and Constraints:

- None

4.3 SUB-SYSTEM 3

Sub-System 3 is otherwise known as the 'D - Section'. It is a 46.1 km branch off Trunk Main 'C' that supplies the towns of Cargo, Cudal and Manildra as well as other consumers fed directly from the Trunk Main.

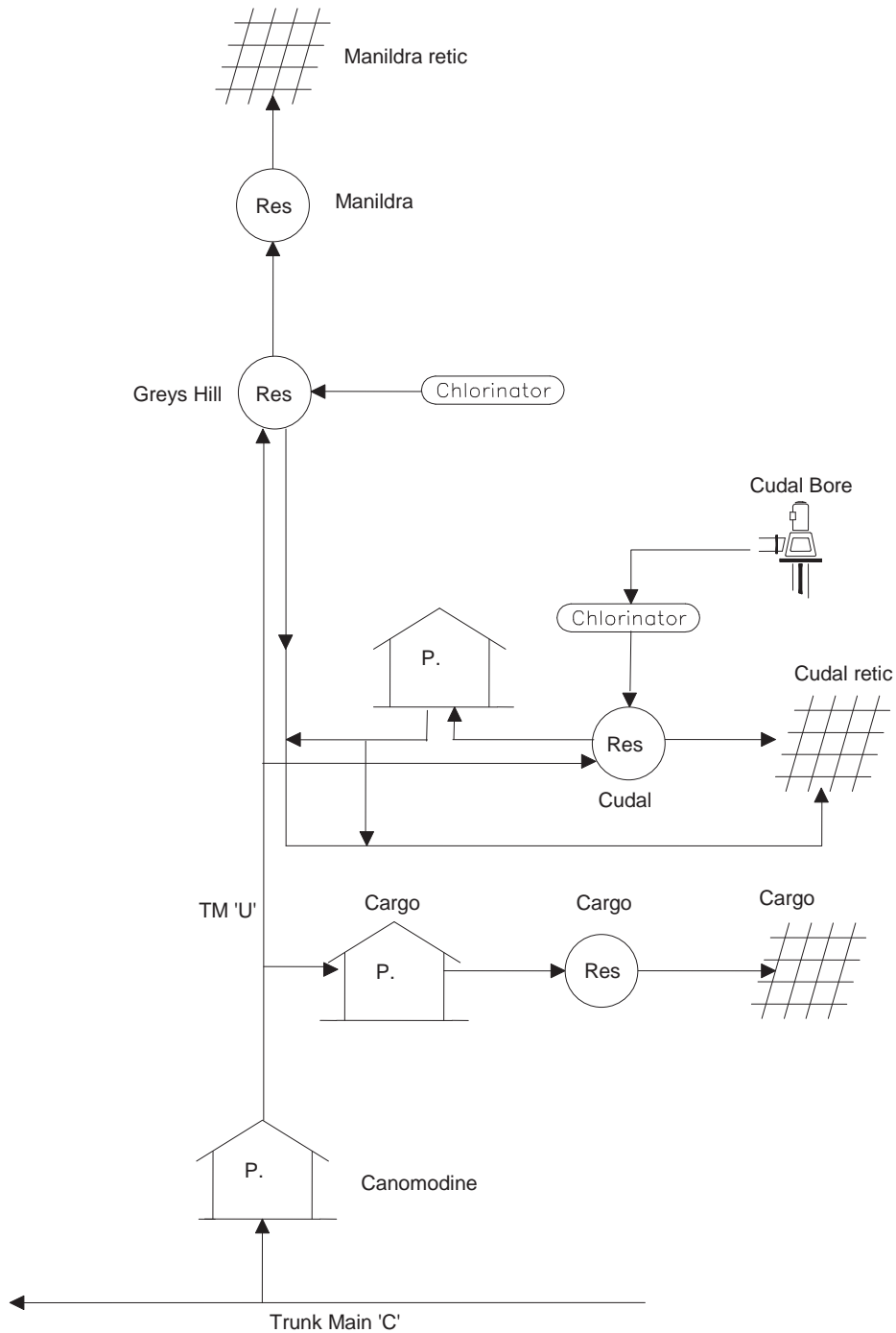


Figure 4.4: Sub-System 3.

4.3.1 TRUNK MAIN 'U'

Objective:

To transfer water from Trunk Main 'C' to Cargo, Cudal and Manildra.

Performance Requirements:

Peak Daily Transfer: 1.8 ML/day
Unplanned Interruptions: Not more than once every month.
Not more than 24 hours duration.

Existing Facilities:

150mm Steel from TM'C' to Belubula River	5.611 km
150mm Cast Iron main from Belubula River to Cudal	28.275 km
150mm UPVC from Cudal to Gray's Hill	3.409 km
100mm CI main from Grays Hill to Manildra	8.800 km
150mm UPVC main from Grays Hill to Manildra	8.800 km

Capacity:

1.8 ML/day

Criticality:

Rating: 1

Cargo, Cudal, Manildra and all consumers supplied from Trunk Main 'U' rely almost entirely on water from Trunk Main 'U'. These consumers would all be affected by lengthy breaks on Trunk Main 'U', the magnitude of the disruption depending on the location of the break.

Cudal has the emergency backup supply of Cudal Bore.

Cargo and Manildra have no alternative supply.

Deficiencies and Constraints:

- Three stand-pipes along the length of main immediately downstream from Canomodine Pump Station may cause enough water hammer to rupture the main when they are closed.
- Sections of the main are unreliable and incur relatively frequent breaks.

4.3.2 CANOMODINE PUMP STATION

Objective:

To boost supply through Trunk Main 'U'.

Performance Requirements:

Peak Daily Demand: 1.8 ML/day

Unplanned Interruptions: Not more than 24 hours duration, every month, when run.

Existing Facilities:

Pump #1 Ritz 4 Multistage with 55 kW motor driven via a Hitachi J300 VSD.

Pump #2 Ritz 4 Multistage with 55 kW motor driven via a Eaton Cutter Hammer VSD

Capacity:

Pump #1 Operation: 1.8 ML/day (running at 50hz) to Cudal

Pump #2 Operation: 1.8 ML/day

Criticality:

Rating: 1 (in peak demand periods).

6 (in normal conditions).

During peak demand periods, supply for the entire Trunk Main 'U' depends on the proper functioning of Canomodine Pump Station. As there is a duty and a stand-by pump, complete disruption of operation is highly unlikely.

Deficiencies and Constraints:

- None

4.3.3 CARGO PUMP STATION

Objective:

To boost supply from Trunk Main 'U' to Cargo Reservoir.

Performance Requirements:

Peak Daily Demand: 0.3 ML/day

Unplanned Interruptions: Not more than 24 hours duration, every week.

Existing Facilities:

The pumps can be operated individually or run together in series.

Pump #1 Southern Cross ISO 50x32x200, 5.5kW motor

Pump #2 Southern Cross ISO 50x32x200, 5.5kW motor

Capacity:

Pump #1 Operation: 0.16 ML/day

Pump #2 Operation: 0.16 ML/day

Pumps #1 and #2 Operation: 0.32 ML/day

Criticality:

Rating: 1

Supply to Cargo relies on the correct functioning of Cargo Pump Station. As there is a duty and a stand-by pump, complete disruption of operation is highly unlikely.

During high demand periods, when both pumps are operating, failure of one of the pumps will reduce supply to Cargo.

Deficiencies and Constraints:

- If inlet pressure from Trunk Main 'U' is low (below 400 kpa) then both pumps must be run in order to generate enough delivery head.

4.3.4 CARGO RESERVOIR

Objective:

To accept water from Cargo Pump Station, store it and supply it to the reticulation system of Cargo.

Performance Requirements:

Peak Daily Input: 0.32 ML/day
Peak Daily Output: 0.32 ML/day
Unplanned Interruptions: Not more than once in seven days.
Not more than 24 hours duration.

Existing Facilities:

- 0.68 ML Reservoir (reinforced concrete).
- Inlet - single 50mm overhead feed.
- Outlet - 150mm underneath.

Capacity:

0.68 ML

Criticality:

Rating: 3

Reservoir can be bypassed allowing water to flow directly from Cargo Pump Station into the Cargo reticulation system.

Deficiencies and Constraints:

- None

4.3.5 CUDAL RESERVOIR

Objective:

To accept water from Trunk Main 'U', store it and supply to Cudal Booster Pump Station and deliver to Grays Hill Reservoir and Cudal Reticulation.

Performance Requirements:

Peak Daily Input: 2.1 ML/day
Peak Daily Output: 2.1 ML/day
Unplanned Interruptions: Not more than once in seven days.
Not more than 24 hours duration.

Existing Facilities:

- 0.23 ML Reservoir (reinforced concrete).
- Inlet - single 100mm underneath.
- Outlet - 150mm underneath.

Capacity:

0.23 ML

Criticality:

Rating: 3

Deficiencies and Constraints:

- None.

4.3.6 CUDAL BORE

Objective:

To act as an emergency water source to supplement supply to Grays Hill during extreme conditions.

Performance Requirements:

Peak Daily Output: 0.45 ML/day
Unplanned Interruptions: Must be ready to operate when needed.

Existing Facilities:

- Well structure.
- Submersible Pump
- Chlorinator (Wallace and Tiernan EA741 'V' Notch)
- Chlorinator Booster Pump (Grunfus 0.55 kW, 4 amp, 240 V, 2750 rpm @ 50 Hz)

Capacity:

Well: 4 L/S
Bore Pump: 0.35 ML/day
Chlorinator: Relative to flow (dose at 5 mg/L, at max. well output, is 2.25 kg/day of chlorine).

Criticality:

Rating: 6

Cudal Bore is a stand-by structure that is not normally used but must still be maintained in operating condition.

Deficiencies and Constraints:

- Poor water quality.
- Uncontrolled catchment area.
- Unpredictable water table level.
- High chlorine dosing rate to cope with unknown and varying microbiological content of the water.
- Ability to cope with sustained operation is unknown.

4.3.7 CUDAL BOOSTER PUMP STATION

Objective:

To accept water from Cudal Reservoir or Trunk Main 'U' and deliver it to Grays Hill Reservoir or Cudal reticulation.

Performance Requirements:

Peak Daily Demand: 1.94ML/day
Unplanned Interruptions: No more than 24 hours duration, four times in one month.

Existing Facilities:

The pump station contains two pumps, one to supply Greys Hill Reservoir, the other to supply the Cudal township.

Pump #1 Southern Cross Starline 80x50x250 37kW
Pump #2 Southern Cross Starline 80x50x250 37kW

Capacity:

Pump #1 (town) 2.1ML/day running at 50Hz via the reticulation to Grays Hill
Pump #2 (Grays Hill) 2.1ML/day running at 50Hz via Trunk Main 'V'

Criticality:

Rating: 3

Both pumps can be used to service either Cudal township or Grays Hill Reservoir via the 100mm CI or 150mm PVC mains.

Deficiencies and Constraints:

- None

4.3.8 GREYS HILL RESERVOIR

Objective:

To act as a balance tank for Trunk Main 'U' and storage for Cudal.

Performance Requirements:

Peak Daily Input: 2.1 ML/day
Peak Daily Output: 1.0 ML/day
Unplanned Interruptions: Not more than once in seven days.
Not more than 24 hours duration.

Existing Facilities:

- 2.27 ML Reservoir (reinforced concrete).
- Single inlet / outlet - 100mm underneath to Cudal.
- Single overhead 150mm – 150mm outlet to Manildra

Capacity:

2.27 ML

Criticality:

Rating: 1 (in peak demand periods).
4 (in normal conditions).

Deficiencies and Constraints:

- None

4.3.9 MANILDRA RESERVOIR

Objective:

To accept water from Trunk Main 'U', store it and supply it to the reticulation system of Manildra.

Performance Requirements:

Peak Daily Input: 1.6 ML/day
Peak Daily Output: 0.8 ML/day
Unplanned Interruptions: Not more than once in seven days.
Not more than 24 hours duration.

Existing Facilities:

- 0.45 ML Reservoir (reinforced concrete).
- Inlet - single 75mm overhead feed or 150mm underneath feed.
- Outlet - 150mm underneath.

Capacity:

0.45 ML

Criticality:

Rating: 3

Reservoir can be bypassed allowing water to flow directly from Trunk Main 'U' into the Manildra reticulation system.

Deficiencies and Constraints:

- Consumers in the higher areas experience low pressure in high demand periods.

4.4 SUB-SYSTEM 4

Sub-System 4 is the Canowindra and Moorbel system as shown on the diagram below.

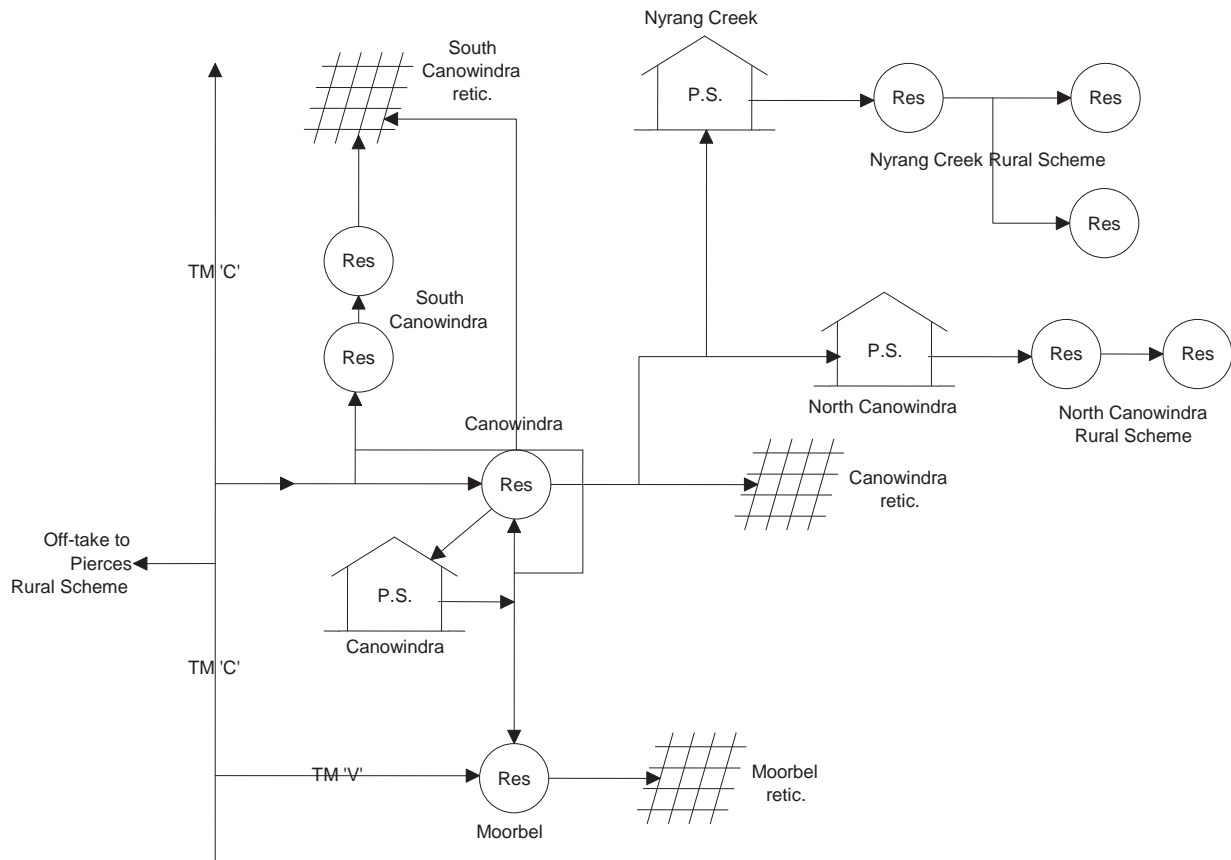


Figure 4.5: Sub-System 4.

Water for the Canowindra system comes from Lake Rowlands via Trunk Main 'C' but can be supplemented in peak demand periods by flow from Bangaroo Bore or Gooloogong Bore.

Under normal conditions, all water for Canowindra, Moorbel, South Canowindra, North Canowindra Rural Scheme and Nyrang Creek Rural Scheme is taken in via Trunk Main 'V' and Moorbel Reservoir.

Moorbel Reservoir feeds to Canowindra Reservoir, South Canowindra Reservoir and Moorbel reticulation.

Canowindra Reservoir then feeds to Canowindra reticulation.

Canowindra Pump Station, can be used to boost supply from Canowindra Reservoir to Canowindra reticulation, Moorbel reticulation and Moorbel Reservoir.

Nyrang Creek Pump Station and North Canowindra Pump Station boost water from Canowindra's reticulation to reservoirs in satellite rural schemes.

4.4.1 TRUNK MAIN 'V'

Objective:

To transfer water from Trunk Main 'C' to Moorbel Reservoir.

Performance Requirements:

Peak Daily Transfer: 2.3 ML/day
Unplanned Interruptions: Not more than 4 times every month.
Not more than 24 hours duration.

Existing Facilities:

4.20 km of 200mm uPVC.

Capacity:

4.0 ML/day

Criticality:

Rating: 4

Under normal conditions, all water for Sub-System 4 is supplied via Trunk Main 'V'. As the main is in good condition and an alternative supply main is available, the criticality of Trunk Main 'V' is relatively low.

Deficiencies and Constraints:

- None.

4.4.2 MOORBEL RESERVOIR

Objective:

To accept water from Trunk Main 'V', store it and supply it to Canowindra Reservoir and the reticulation system of Moorbel.

Performance Requirements:

Peak Daily Input: 2.3 ML/day
Peak Daily Output: 2.3 ML/day
Unplanned Interruptions: Not more than once in seven days.
Not more than 24 hours duration.

Existing Facilities:

- 1.14 ML Reservoir (reinforced concrete).
- Inlet - dual 100mm overhead feeds.
- Outlet - dual 150mm underneath.

Capacity:

1.14 ML

Criticality:

Rating: 1

Moorbel Reservoir cannot be completely bypassed. The overhead feeds may be closed allowing a partial bypass operation. Moorbel Reservoir is the largest of the Canowindra area reservoirs and so its correct operation is important to the areas reliability of supply.

Deficiencies and Constraints:

- No bypass operation.

4.4.3 CANOWINDRA RESERVOIR

Objective:

To accept water from either Moorbel Reservoir or main from Trunk Main 'C', store it and supply it to the reticulation systems of Canowindra.

Performance Requirements:

Peak Daily Input: 0.8 ML/day
Peak Daily Output: 0.8 ML/day
Unplanned Interruptions: Not more than once in seven days.
Not more than 24 hours duration.

Existing Facilities:

- 0.91 ML Elevated Reservoir (reinforced concrete).
- Inlet / Outlet 150mm underneath, from Moorbel Reservoir.
- Inlet / Outlet 150mm underneath, from Trunk Main 'C'.

Capacity:

0.91 ML

Criticality:

Rating: 3

Reservoir can be bypassed in the event of problems occurring with any valves or other hardware.

Deficiencies and Constraints:

- Some consumers experience low pressure, as elevation difference between reservoir and reticulation is small.

4.4.4 CANOWINDRA PUMP STATION

Objective:

To pump water from Canowindra Reservoir to Moorbel Reservoir and/or boost supply to Canowindra and South Canowindra reticulations.

Performance Requirements:

Peak Daily Demand: 1.0 ML/day

Unplanned Interruptions: Not more than 24 hours duration, 4 times every month.

Existing Facilities:

Pumps are only run individually - never together.

Pump #1: Southern Cross 80x50x315 with 30 kW, 50 amp motor.

Pump #2: Kelly and Lewis, Model 70 with 22 kW, 38 amp motor.

Capacity:

Pump #1 Operation: 1.0 ML/day

Pump #2 Operation: 1.0 ML/day

Criticality:

Rating: 4

As there is a duty and stand-by pump arrangement, combined with the fact that Canowindra Pump Station is very rarely used, this facility is considered as having low criticality.

Deficiencies and Constraints:

- None.

4.4.5 SOUTH CANOWINDRA RESERVOIRS

Objective:

To accept water from either Moorbel Reservoir or main from Trunk Main 'C', store it and supply it to the reticulation system of South Canowindra.

Performance Requirements:

Peak Daily Input: 0.1 ML/day

Peak Daily Output: 0.1 ML/day

Unplanned Interruptions: Not more than once in seven days.
Not more than 24 hours duration.

Existing Facilities:

- Two 0.18 ML Reservoir (reinforced concrete).
- Inlet / Outlet 150mm underneath, from Moorbel Reservoir.
- Inlet / Outlet 150mm underneath, from Trunk Main 'C'.

Capacity:

0.36 ML (two 0.18 ML connected reservoirs)

Criticality:

Rating: 3

South Canowindra Reservoirs provide storage to help meet peak consumption rates in South Canowindra. The reservoirs can be bypassed allowing water from Canowindra Reservoir or main from trunk Main 'C' to flow directly into the South Canowindra reticulation.

Deficiencies and Constraints:

- None

4.4.6 NORTH CANOWINDRA PUMP STATION

Objective:

To pump water from Canowindra reticulation to the North Canowindra Rural Scheme.

Performance Requirements:

Peak Daily Demand: 0.1 ML/day

Unplanned Interruptions: Not more than 24 hours duration, 4 times every month.

Existing Facilities:

The pumps can only be operated individually - they are never run together.

Pump #1 Southern Cross, Model MFAO 8A-F with 5.5 kW, 10.2 amp motor.

Pump #2 Southern Cross, Model MFAO 8A-F with 5.5 kW, 10.2 amp motor.

Capacity:

Pump #1 Operation: 0.43 ML/day

Pump #2 Operation: 0.43 ML/day

Criticality:

Rating: 1

Supply to the North Canowindra Rural Scheme relies on the correct functioning of North Canowindra Pump Station. As there is a duty and a stand-by pump, complete disruption of operation is highly unlikely.

Deficiencies and Constraints:

- No telemetry control.
- A pump is usually run continuously during summer increasing operating and maintenance costs.

4.4.7 NORTH CANOWINDRA RURAL SCHEME

Objective:

To supply water to the consumers of North Canowindra for domestic and rural applications.

Performance Requirements:

Peak Daily Demand: 0.1 ML/day
Unplanned Interruptions: Not more than once in seven days.
Not more than 24 hours duration.

Existing Facilities:

- Two 0.09 ML Reservoir (reinforced concrete) each with 50mm overhead feeds and 75mm underneath outlets.
- Approximately 9.82 km of 75mm A.C. main.

Capacity:

Reservoir #1: 0.09 ML
Reservoir #2: 0.09 ML
Main: 0.1 ML/day

Criticality:

Rating: 1

The small number of consumers supplied by the North Canowindra Rural Scheme rely on this supply, which is therefore given a high criticality.

Deficiencies and Constraints:

- During high demand periods, consumers at the extremities of the scheme are starved of supply due to the large demands of downstream consumers.
- Consumers served off the rising main experience fluctuations in pressure caused by starting and stopping of the duty pump.
- CTW has responsibility for several long service connections made of inferior grade pipe that give continuous maintenance problems.

4.4.8 NYRANG CREEK PUMP STATION

Objective:

To pump water from Canowindra reticulation to the Nyrang Creek Rural Scheme.

Performance Requirements:

Peak Daily Demand: 0.1 ML/day

Unplanned Interruptions: Not more than 24 hours duration, 4 times every month.

Existing Facilities:

This is a single pump:

Southern Cross, Model MFAO 8A-F with 5.5kW, 10.2 amp motor.

Capacity:

0.1 ML/day

Criticality:

Rating: 3

During peak demand periods, usually in summer, supply to the Nyrang Creek Rural Scheme relies on the correct functioning of Nyrang Creek Pump Station. If the pump fails, the scheme is still supplied but a reduced rate.

Deficiencies and Constraints:

- No telemetry control.
- No automatic or timer control - the pump must be started and stopped by the operator.
- Only a single pump - no stand-by. Failure during peak demand periods would significantly reduce supply to Nyrang Creek consumers, especially at the scheme's extremities.

4.4.9 NYRANG CREEK RURAL SCHEME

Objective:

To supply water to the consumers of the Nyrang Creek area for domestic and rural applications.

Performance Requirements:

Peak Daily Demand: 0.1 ML/day

Unplanned Interruptions: Not more than once in seven days.
Not more than 24 hours duration.

Existing Facilities:

Northern Reservoir: 0.045 ML (reinforced concrete) with a 50mm overhead feed and a 50mm underneath outlet.
Southern Reservoir: 0.091 ML (reinforced concrete) with a 75mm overhead feed, two 75mm underneath outlets and a 50mm bypass.
Eastern Reservoir: 0.136 ML (reinforced concrete) with a 50mm overhead feed and two 75mm underneath outlets.
Main: Various lengths of 100mm, 75mm and 50mm PVC mains.

Capacity:

Northern Reservoir: 0.045 ML
Southern Reservoir: 0.091 ML
Eastern Reservoir: 0.136 ML
Main: 0.1 ML/day

Criticality:

Rating: 1

The small number of minor consumers supplied by the Nyrang Creek Rural Scheme rely on this supply, which is therefore given a high criticality.

Deficiencies and Constraints:

- During high demand periods, consumers at the extremities of the scheme are starved of supply due to the large demands of downstream consumers.
- Consumers served off the rising main experience fluctuations in pressure caused by starting and stopping of the duty pump.

4.5 SUB-SYSTEM 5

Sub-System 5 is Bangaroo Bore and Pump Station, as shown on the diagram below.

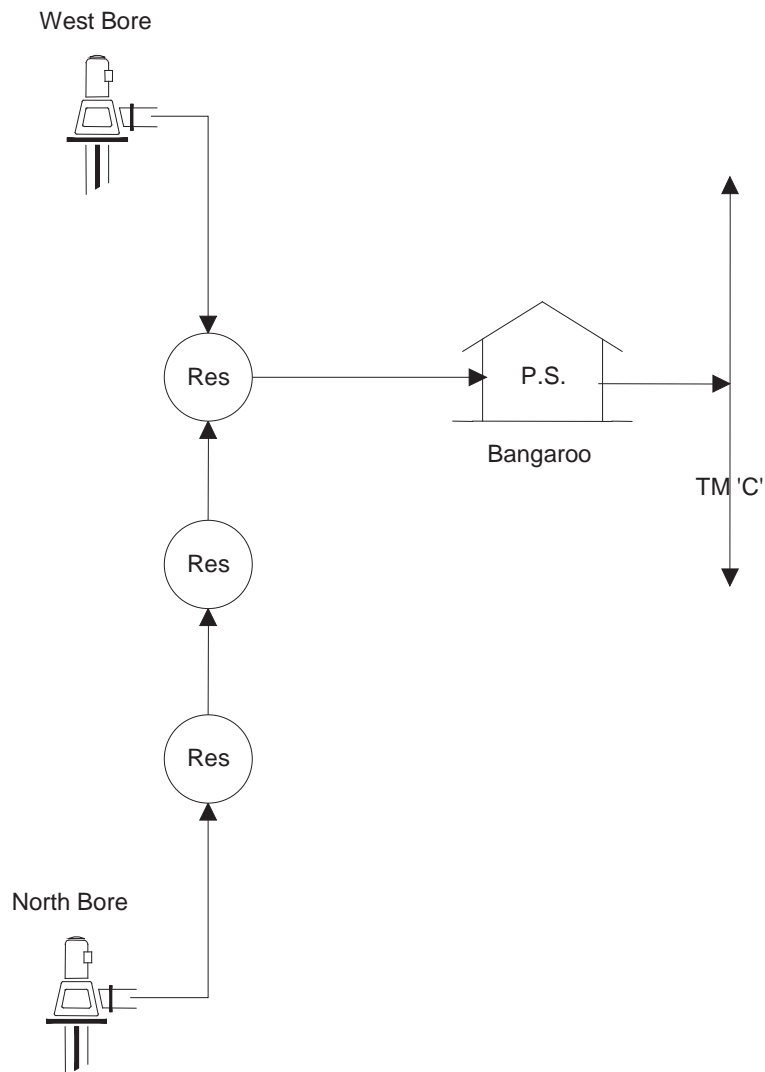


Figure 4.6: Sub-System 5.

Bangaroo Bore and Pump Station consists of two bores with surface pumps, three service reservoirs and two pumps.

The Western Bore is the duty bore while the Northern Bore is the stand-by. The reservoirs are all connected underneath. Water can be pumped in either direction along Trunk Main 'C'.

Under normal conditions Bangaroo Bore and Pump Station is not used but is maintained as a back-up supply.

In emergency conditions, Bangaroo Bore usually supplements supply to Canowindra but can also be used to supply Grenfell and Eugowra-Gooloogong systems.

4.5.1 BANGAROO BORE PUMP STATION

Objective:

To pump water from Bangaroo Bore to either Canowindra or to Grenfell and Eugowra-Gooloogong during extreme operating conditions.

Performance Requirements:

Peak Daily Demand: 1.3 ML/day

Unplanned Interruptions: Must be ready to operate when needed.

Existing Facilities:

Pumps #1 and #2 run individually, never together.

Pump #1: Southern Cross 80x50x250 pump with 55 kW motor.

Pump #2 Ornel 150 mm Bore, 23 stage pump with 22 kW, 93 amp motor.

Capacity:

Pump #1 Operation: 1.3 ML/day

Pump #2 Operation: 0.6 ML/day

Criticality:

Rating: 4

As there are several pumping arrangements available when supplying Canowindra (the primary function) the likelihood of complete breakdown is highly unlikely.

As Bangaroo Bore and Pump Station is a stand-by facility that is rarely operated its criticality is considered as being low.

Deficiencies and Constraints:

- No automatic or telemetrical control over the pump station. Pumps must be started and stopped manually by the operator.
- No protection against the service reservoirs running dry during pump operation.
- As the pumps are rarely used it is necessary for the pumps to manually turned, periodically, to prevent seizing and clogging.

4.5.2 BANGAROO BORE SERVICE RESERVOIRS

Objective:

To accept water from the Bangaroo Bores, store it and supply it to Bangaroo Bore Pump Station.

Performance Requirements:

Peak Daily Input: 3.5 ML/day
Peak Daily Output: 1.3 ML/day
Unplanned Interruptions: Not more than once in seven days.
Not more than 24 hours duration.

Existing Facilities:

- Three 0.18 ML Reservoirs (reinforced concrete).
- Inlets: 150mm overhead feeds from each bore.
- Outlets: 200mm underneath, connecting reservoirs and to Pump Station.

Capacity:

0.54 ML (three 0.18 ML reservoirs).

Criticality:

Rating: 4

In the context of Sub-System 5, the service reservoirs are important as they cannot be bypassed and are needed to store bore water. In the context of the whole CTW system the Bangaroo Bore service reservoirs have a low criticality.

Deficiencies and Constraints:

- No telemetry level indication.
- No level sensing equipment for automatic control of bore pumps or pump station.

4.5.3 BANGAROO BORES

Objective:

To pump groundwater into the Bangaroo Bore Service Reservoirs.

Performance Requirements:

Peak Daily Output: 0.6 ML/day (North Bore)
3.0 ML/day (West Bore)

Unplanned Interruptions: Must be ready to operate when needed.

Existing Facilities:

Northern Bore: Southern Cross LAJ, 150mm, 6 stage with 9 kW, 31 amp motor.
Western Bore: Ornel Bore Pump, 150mm, 13 stage with 18.5 kW, 61 amp motor.

Capacity:

3.0 ML/day (rated bore field capacity).

0.6 ML/day (Northern Bore pump capacity).

3.0 ML/day (Western Bore pump capacity).

Criticality:

Rating: 4

In the context of Sub-System 5, the bores are important, as they are needed to supply bore water. As there is a duty and a stand-by bore, complete failure is very unlikely.

In the context of the whole CTW system the Bangaroo Bores have a low criticality.

Deficiencies and Constraints:

- No automatic control of the bore pumps.
- No control over quality of bore water.
- Unknown and varying water table may not sustain bore pump maximum output for lengthy, continuous operation.

4.6 SUB-SYSTEM 6

Sub-System 6 is the Gooloogong Bore and Pump Station, as shown on the diagram below.

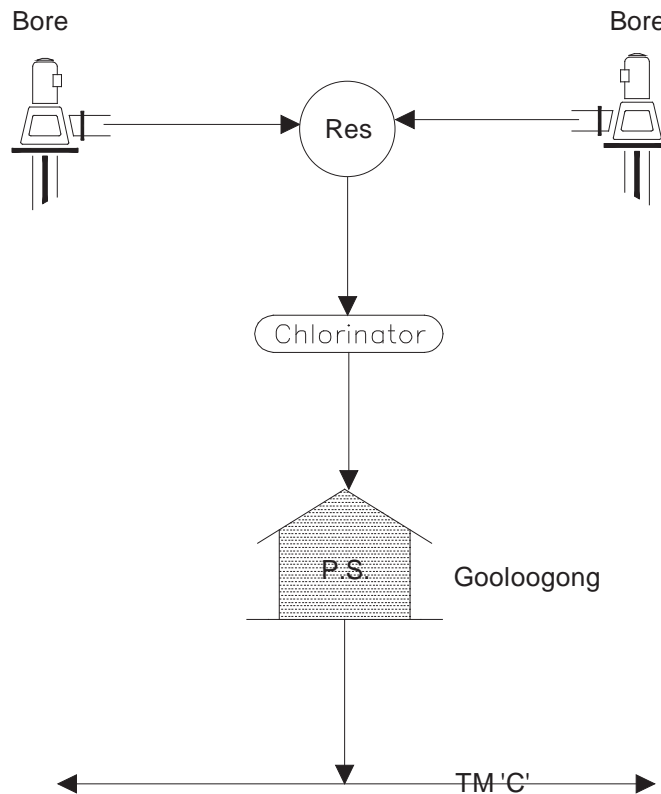


Figure 4.7: Sub-System 6.

Gooloogong Bore and Pump Station consists of two bores , a service reservoir and two surface pumps.

There is one duty bore and one stand-by bore, delivering water to the reservoir. Water can be pumped in either direction along Trunk Main 'C'.

Under normal conditions Gooloogong Bore and Pump Station is not used but is maintained as a back-up supply.

In emergency conditions, Gooloogong Bore usually supplements supply to Grenfell but can also be used to supply the Eugowra-Gooloogong and Canowindra systems.

4.6.1 GOOLOONG BORE PUMP STATION

Objective:

To pump water from Gooloong Bore to either Grenfell or to Grenfell, Eugowra-Gooloong and Canowindra during extreme operating conditions.

Performance Requirements:

Peak Daily Demand: 3.0 ML/day

Unplanned Interruptions: Must be ready to operate when needed.

Existing Facilities:

The pumps are run individually. The surface pumps are run individually – never together.

Pump #1 KSB Multitec C100/4 – 7.1.11.62 4 stage, 132kW motor

Pump #2 KSB Multitec C100/4 – 7.1.11.62 4 stage, 132kW motor

Capacity:

Pump #1 Operation: 1.8 ML/day (direct to Grenfell).

3.0 ML/day (to Grenfell via McDonalds Lane Pump Station).

Pump #2 Operation: 1.8 ML/day (direct to Grenfell).

3.0 ML/day (to Grenfell via McDonalds Lane Pump Station).

Pumps #1 and #2 Operation: 3.0 ML/day (to Grenfell, Eugowra/Gooloong and Canowindra).

Pumps #1 and #2 Operation: 3.0 ML/day (to Grenfell via McDonald's Lane & Eugowra/Gooloong).

Criticality:

Rating: 1 (during peak demand periods).

4 (during normal conditions).

As there are several pumping arrangements available the likelihood of complete breakdown is highly unlikely.

As Gooloong Bore and Pump Station is a stand-by facility that is not normally operated its criticality is considered as being low.

Deficiencies and Constraints:

- Poor electrical infrastructure lead to power outages during peak summer periods.

4.6.2 GOOLOONGONG BORE SERVICE RESERVOIR

Objective:

To accept water from the Gooloogong Bores, store it and supply it to Gooloogong Bore Pump Station.

Performance Requirements:

Peak Daily Input: 3.0 ML/day
Peak Daily Output: 3.0 ML/day
Unplanned Interruptions: Not more than once in seven days.
Not more than 24 hours duration.

Existing Facilities:

- 0.18 ML Reservoir (reinforced concrete).
- Inlets: 150mm overhead feeds from each bore.
- Outlets: One 200mm underneath and one 150mm underneath.

Capacity:

0.18 ML

Criticality:

Rating: 1 (during peak demand periods).
4 (during normal conditions).

In the context of Sub-System 6, the service reservoir is important as it cannot be bypassed and is needed to store bore water. In the context of the whole CTW system the Gooloogong Bore service reservoir has a low criticality.

Deficiencies and Constraints:

- None.

4.6.3 CHLORINATOR

Objective:

To disinfect the bore water before it is contributed to supply.

Performance Requirements:

Peak Daily Flow: 2.6 ML/day
Chlorine Dose: 5 mg/L
Unplanned Interruptions: Must be ready to operate when needed.

Existing Facilities:

- Chlorinator (Wallace and Tiernan, V100, V-Notch)
- Two Chlorine Cylinders:

The chlorinator consists of a chlorine gas supply gauge, a manually adjusted V-notch orifice to regulate gas flow rate and a chlorine injector.

Capacity:

Dose at 5 mg/L

Disinfection of 2.6 ML/day

13.5 kg of chlorine per day

Criticality:

Rating: 1 (during peak demand periods).
4 (during normal conditions).

Correct operation of the chlorinator is important if consumers are to be supplied with bore water for periods of time greater than 24 hours.

If water from Gooloogong Bore is diluted with water supplied from Carcoar WTP or Grenfell WTP, then the criticality of Gooloogong chlorinator is slightly lessened.

As the Gooloogong Bore only operates as a stand-by facility, its criticality as part of the whole CTW system is considered to be low.

Deficiencies and Constraints:

- Must be prepared, started and stopped manually by the operator.
- As this facility is only operated for a few weeks every year, time consuming set-up and removal-from-operation procedures must be carried out every year.

4.6.4 GOOLOOGONG BORES

Objective:

To pump groundwater into the Gooloogong Bore Service Reservoir.

Performance Requirements:

Peak Daily Output: 3.8 ML/day

Unplanned Interruptions: Must be ready to operate when needed.

Existing Facilities:

Bore #1: Gould 3 stage 8RJHC turbine submersible 30kW

Bore #2: Southern Cross, 150mm, LAJ, 2-stage with 18.5 kW, 31 amp motor.

Capacity:

Bore Pump Capacity: 3.8 ML/day (each bore).

Bore Field Rated Capacity: 5.0 ML/day.

Criticality:

Rating: 1 (during peak demand periods).

4 (during normal conditions).

In the context of Sub-System 6, the bores are important, as they are needed to supply bore water. As there is a duty and a stand-by bore, complete failure is very unlikely.

In the context of the whole CTW system the Gooloogong Bores have a low criticality.

Deficiencies and Constraints:

- No control over quality of bore water.
- Sustained supply of bore water to consumers may result in high number of complaints of poor aesthetic quality.
- Poor electrical infrastructure leads to power outages during peak summer periods.

4.7 SUB-SYSTEM 7

Sub-System 7 is the Eugowra area, as shown on the diagram below.

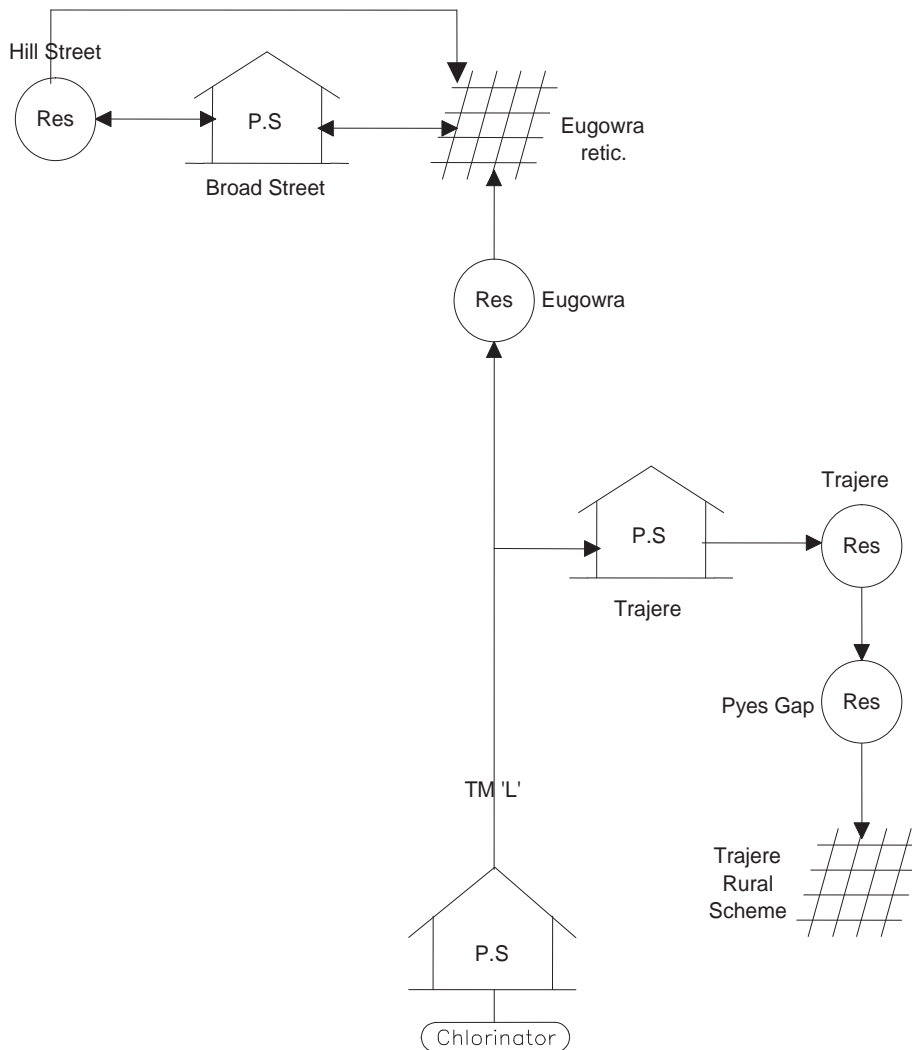


Figure 4.8: Sub-System 7.

Under normal conditions, water from Carcoar WFP, transferred via Trunk Main 'C', is fed to Eugowra via Trunk Main 'L'.

Water for Eugowra is stored in Eugowra Reservoir and Hill Street Reservoirs.

Trajere Pump Station delivers water to Trajere and Pyes Gap Reservoirs and on to Trajere Rural Scheme.

Under extreme conditions, supply to Eugowra can be supplemented from Gooloogong Bore or Bangaroo Bore.

4.7.1 TRUNK MAIN 'L'

Objective:

To transfer water from Trunk Main 'C' to Eugowra Reservoir.

Performance Requirements:

Peak Daily Transfer: 1.3 ML/day
Unplanned Interruptions: Not more than once every month.
Not more than 24 hours duration.

Existing Facilities:

150mm AC main, 20.0 km long.

Capacity:

0.8 ML/day.

Criticality:

Rating: 1

Eugowra and Trajere Rural Scheme rely on supply from Trunk Main 'L'. Lengthy breaks on the main would affect consumers in these centers.

Deficiencies and Constraints:

- Use of standpipes along main during peak demand periods starves Eugowra of supply.

4.7.2 TRUNK MAIN 'L' BOOSTER PUMP

Objective:

To accept water from Trunk Main 'L' boost to Eugowra.

Performance Requirements:

Peak Daily Demand: 1.3 ML/Day
Unplanned Interruptions: No more than 24 hours, four times in one month.

Existing Facilities:

The pump station contains two pumps.

Pump #1 Southern Cross 80x50x250 with a 22kW motor

Pump #2 Southern Cross 80x50x250 with a 22kW motor

The pumps are run individually – never together.

Capacity:

2.1 ML/day

Criticality:

Rating: 3

The Trunk Main 'L' Booster pump only operates during peak summer periods to boost water to Eugowra. A breakdown of the pump station would only cause a minor interruption, as water would automatically bypass the pump station.

4.7.3 TRAJERE PUMP STATION

Objective:

To pump water from Trunk Main 'L' to Trajere Reservoir.

Performance Requirements:

Peak Daily Demand: 0.1 ML/day

Unplanned Interruptions: Not more than 24 hours duration, every month.

Existing Facilities:

Both pumps operate directly in series.

Pump #1 Southern Cross Model MFAO 8A-F with 5.5kW motor.

Pump #2 Southern Cross Model MFAO 8A-F with 5.5kW motor.

Capacity:

0.1 ML/day

Criticality:

Rating: 2

Supply to Trajere Rural Scheme depends upon the correct functioning of Trajere Pump Station.

Deficiencies and Constraints:

- None.

4.7.4 TRAJERE RESERVOIR

Objective:

To accept water from Trajere Pump Station, store it and supply it to Trajere Rural Scheme and supply Pyes Gap reservoir.

Performance Requirements:

Peak Daily Input: 0.1 ML/day
Peak Daily Output: 0.1 ML/day
Unplanned Interruptions: Not more than once in seven days.
Not more than 24 hours duration.

Existing Facilities:

- 0.14 ML Reservoir (reinforced concrete).
- Inlet - single 75mm overhead feed.
- Outlet - single 75mm underneath.

Capacity:

0.14 ML

Criticality:

Rating: 2

Supply to Trajere Rural Scheme depends upon the correct functioning of Trajere Reservoir.

Deficiencies and Constraints:

- Reservoir cannot be bypassed.

4.7.5 PYES GAP RESERVOIR

Objective:

To accept water from Trajere Reservoir, store it and supply it to Pyes Gap Rural Scheme.

Performance Requirements:

Peak Daily Input: 0.1 ML/day
Peak Daily Output: 0.1 ML/day
Unplanned Interruptions: Not more than once in seven days.
Not more than 24 hours duration.

Existing Facilities:

- 0.14 ML Reservoir (reinforced concrete).

- Inlet - single 50mm overhead feed.
- Outlet - single 100mm underneath.

Capacity:

0.14 ML

Criticality:

Rating: 2

Supply to Pyes Gap Rural Scheme depends upon the correct functioning of Pyes Gap Reservoir.

Deficiencies and Constraints:

- No telemetry monitoring equipment.
- Reservoir cannot be bypassed.

4.7.6 EUGOWRA RESERVOIR

Objective:

To accept water from Trunk Main 'L', store it and supply it to the reticulation system of Eugowra.

Performance Requirements:

Peak Daily Input: 1.3 ML/day
Peak Daily Output: 1.3 ML/day
Unplanned Interruptions: Not more than once in seven days.
Not more than 24 hours duration.

Existing Facilities:

- 1.36 ML Reservoir (reinforced concrete).
- Inlet - single 150mm overhead feed or 150mm underneath feed.
- Outlet - single 150mm underneath.

Capacity:

1.36 ML

Criticality:

Rating: 3

Reservoir is the main storage source for Eugowra but can be bypassed if required.

Deficiencies and Constraints:

- None

4.7.7 BROAD STREET PUMP STATION

Objective:

To pump water from Eugowra reticulation to Hill Street Reservoir, boost the pressure in the reticulation on the western side of the bridge.

Performance Requirements:

Peak Daily Demand: 0.8 ML/day

Unplanned Interruptions: Not more than 24 hours duration, every week.

Existing Facilities:

- Pump/Motor Starline 80x50x200 with 11kW motor.
- Pump/Motor Starline 80x50x200 with 11kW motor.

Capacity:

0.8 ML/day

Criticality:

Rating: 4

Broad Street Pump Station only operates during peak periods and to fill the Hill Street Reservoir. A breakdown of the pump station would only cause minor disruption to consumers in way of reduced pressure.

Deficiencies and Constraints:

- Consumers served off the rising main and the section of reticulation that the pump draws from will experience changes in pressure during pump start-up and shutdown.

4.7.8 HILL STREET RESERVOIRS

Objective:

To accept water from Broad Street Pump Station, store it and supply it the Eugowra reticulation system.

Performance Requirements:

Peak Daily Input: 0.8 ML/day

Peak Daily Output: 0.8 ML/day

Unplanned Interruptions: Not more than once in seven days.
Not more than 24 hours duration.

Existing Facilities:

- 0.05 ML Reservoir (reinforced concrete).
- 0.45 ML Reservoir (reinforced concrete).
- Inlet - single 100mm overhead feed.
- Outlet - single 150mm underneath.

Capacity:

0.50 ML

Criticality:

Rating: 4

Hill Street Reservoirs are used to supply the higher areas of Eugowra. Therefore, if Hill Street Reservoir were off-line, only a small number of consumers would be affected.

Deficiencies and Constraints:

- No telemetry monitoring equipment.

4.8 SUB-SYSTEM 8

Sub-System 8 is the Grenfell area, as shown on the diagram below.

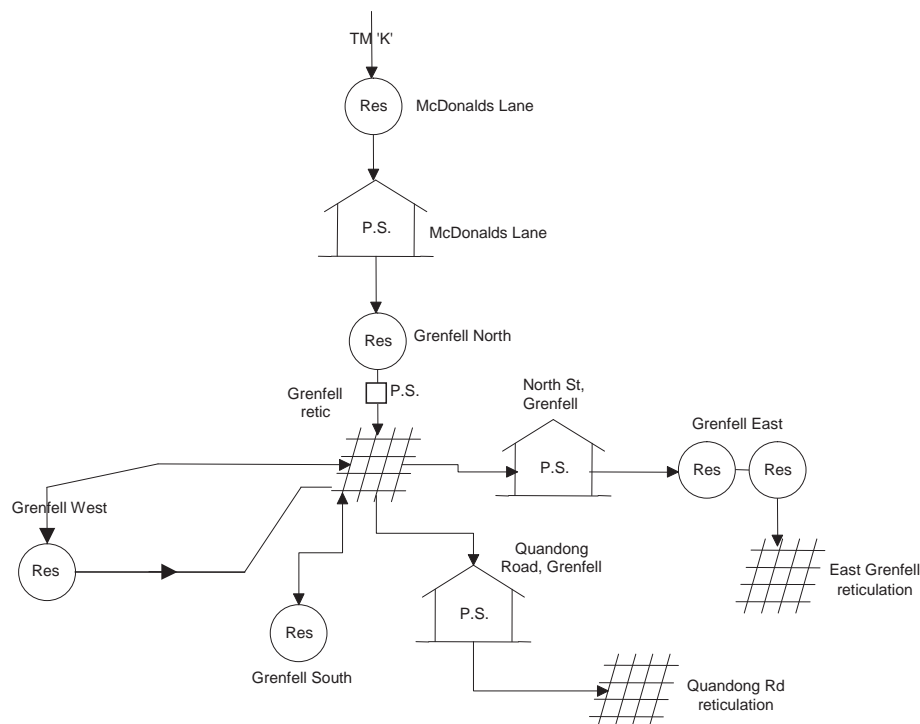


Figure 4.9: Sub-System 8.

Under normal conditions, water from Carcoar WFP is supplied to Grenfell via Trunk Main 'C' and Trunk Main 'K'. This water is stored in reservoirs around the town.

During peak demand periods, water from Gooloogong Bore and in emergency conditions, water from Bangaroo Bore is used to supplement supply to Grenfell.

4.8.1 TRUNK MAIN 'K'

Objective:

To transfer supply from Trunk Main 'C' to Grenfell North Reservoir.

Performance Requirements:

- Peak Daily Transfer: 1.4 ML/day (straight through).
2.6 ML/day (with McDonalds Lane Pump Station).
- Unplanned Interruptions: Not more than once every month.
Not more than 24 hours duration.

Existing Facilities:

200mm Steel main, 34.12 km long.

Capacity:

2.6 ML/day

Criticality:

Rating: 1

Trunk Main 'K' is the only means of supplying water to Grenfell.

Deficiencies and Constraints:

- None.

4.8.2 McDONALDS LANE PUMP STATION

Objective:

To boost supply to Grenfell via Trunk Main 'K' during peak demand periods.

Performance Requirements:

Peak Daily Demand: 2.6 ML/day

Unplanned Interruptions: Must be ready to operate when needed.

Existing Facilities:

Pump #1 Ritz 4910A 4 stage with 110kW motor.

Pump #2 KSB WFK 80.6.6.1 BG4-53.4 with 110kW motor.

Service Reservoir: 0.14 ML (reinforced concrete).

Inlet: 150mm overhead feed and 150mm underneath feed.

Outlet: 150mm underneath.

Capacity:

Booster Pump: 2.6 ML/day

Service Reservoir: 0.14 ML

Criticality:

Rating: 2

McDonalds Lane Pump Station is stand-by facility, only used when supply to Grenfell via Trunk Main 'K' is needed at an increased rate.

As Grenfell can be supplied via Trunk Main 'K', without McDonalds Lane, a breakdown of the pump station would only cause a minor interruption to the supply.

Deficiencies and Constraints:

- Trunk Main 'K' beyond McDonalds Lane pump station fails at pressures above 2000 kpa.

4.8.3 GRENFELL NORTH RESERVOIR

Objective:

To act as a balance tank for Trunk Main 'K' and store water for supply to Grenfell.

Performance Requirements:

Peak Daily Input: 2.6 ML/day
Peak Daily Output: 2.6 ML/day
Unplanned Interruptions: Not more than once in seven days.
Not more than 24 hours duration.

Existing Facilities:

- 4.55 ML Reservoir (reinforced concrete).
- Inlet - single 200mm underneath feed.
- Outlet - single 200mm underneath.

Capacity:

4.55 ML

Criticality:

Rating: 3

As the Grenfell North Reservoir is the largest water storage for Grenfell, it does have a higher level of criticality than other reservoirs around Grenfell.

This reservoir can be bypassed and water to Grenfell easily supplied from other sources.

Deficiencies and Constraints:

- None

4.8.4 GRENFELL NORTH TRANSFER BOOSTER

Objective:

To accept water from the Grenfell north Reservoir and boost the pressure through the Grenfell reticulation.

Performance Requirements:

Peak Daily Demand: 2.6ML/day

Unplanned Interruptions: No more than 24 hours, four times in one month.

Existing Facilities:

The pump station contains two pumps.

Pump #1 Southern Cross Starline 125x100x315 with 18.5kW motors

Pump#2 Southern Cross Starline 125x100x315 with 18.5kW motors

These pumps are run individually, never together.

Capacity:

2.6ML/day

Criticality:

Rating: 3

The Grenfell north Transfer Booster operates during peak summer periods. A breakdown on the pump station would only cause a minor interruption, as water would automatically bypass the pump station.

4.8.5 NORTH STREET PUMP STATION

Objective:

To pump water from Grenfell reticulation to Grenfell East Reservoirs.

Performance Requirements:

Peak Daily Demand: 0.1 ML/day

Unplanned Interruptions: Not more than 24 hours duration, every week.

Existing Facilities:

Southern Cross Starline 50x32x200 with a 7.5kW motor.

Capacity:

0.1 ML/day

Criticality:

Rating: 1

If the pump station broke down, the reticulation fed by the Grenfell East Reservoirs cannot be supplied by an alternative source.

Deficiencies and Constraints:

- Pump located in pit.
- Consumers served off the rising main and the section of reticulation that the pump draws from will experience changes in pressure during pump start-up and shutdown.

4.8.6 GRENFELL EAST RESERVOIRS

Objective:

To accept water from North Street Pump Station, store it and supply it to Grenfell East reticulation.

Performance Requirements:

Peak Daily Input: 0.1 ML/day
Peak Daily Output: 0.1 ML/day
Unplanned Interruptions: Not more than once in seven days.
Not more than 24 hours duration.

Existing Facilities:

Reservoir #1:

Material: Reinforced concrete.
Inlet: Single 100mm overhead feed.
Outlet: Three 100mm underneath.

Reservoir #2:

Material: Reinforced concrete.
Inlet: Single 100mm overhead feed.
Outlet: Single 100mm underneath.

Capacity:

Reservoir #1: 0.181 ML
Reservoir #2: 0.272 ML

Criticality:

Rating: 3

Under normal conditions, both reservoirs are used, though if desired, only one reservoir can be used or both can be bypassed. The reticulation fed by the Grenfell East Reservoirs cannot be supplied by an alternative source.

Deficiencies and Constraints:

- None

4.8.7 QUONDONG ROAD PUMP STATION

Objective:

To provide a static pressure to the Quondong Road reticulation system.

Performance Requirements:

Peak Daily Demand: 0.1 ML/day

Unplanned Interruptions: Not more than 24 hours duration, every month.

Existing Facilities:

Southern Cross Sovereign, 155mm impeller with 4 kW, 7 amp motor.

Capacity:

0.1 ML/day

Criticality:

Rating: 2

Supply to the small number of consumers along Quondong Road, Grenfell, depends on the correct operation of Quondong Road Pump Station.

Deficiencies and Constraints:

- Pump operates continuously, 24 hours per day, increasing running costs and the need for maintenance and shortening expected operating life.
- No telemetry control.
- Pump located in pit.

4.8.8 GRENFELL SOUTH RESERVOIR

Objective:

To accept water from Grenfell reticulation, store it and supply it to Grenfell South reticulation.

Performance Requirements:

Peak Daily Input: 0.1 ML/day

Peak Daily Output: 0.1 ML/day

Unplanned Interruptions: Not more than once in seven days.

Not more than 24 hours duration.

Existing Facilities:

- 0.09 ML Reservoir (reinforced concrete).

- Inlet - single 50mm underneath feed.
- Outlet - single 50mm underneath.

Capacity:

0.09 ML

Criticality:

Rating: 4

As the reservoir feeds a small number of consumers, its criticality is considered low.

Deficiencies and Constraints:

- No telemetry monitoring system.

4.8.9 GRENFELL WEST RESERVOIR

Objectives:

Under normal conditions, to accept water from Grenfell North Reservoir, store it and supply it to Grenfell reticulation.

Performance Requirements:

Peak Daily Input: 1.5 ML/day
Peak Daily Output: 1.5 ML/day
Unplanned Interruptions: Not more than once in seven days.
Not more than 24 hours duration.

Existing Facilities:

- 1.36 ML Reservoir (reinforced concrete).
- Inlet - single 150mm overhead feed (from WTP).
- Inlet / Outlet - single 100 underneath.
- Outlet - single 150mm overhead (to booster).

Capacity:

1.36 ML

Criticality:

Rating: 1

The reservoir is a large storage component for Grenfell.

Deficiencies and Constraints:

- None

4.9 SUB-SYSTEM 9

Sub-System 9 is the Quandialla Bore, Pump Station and reservoirs as shown on the diagram below.

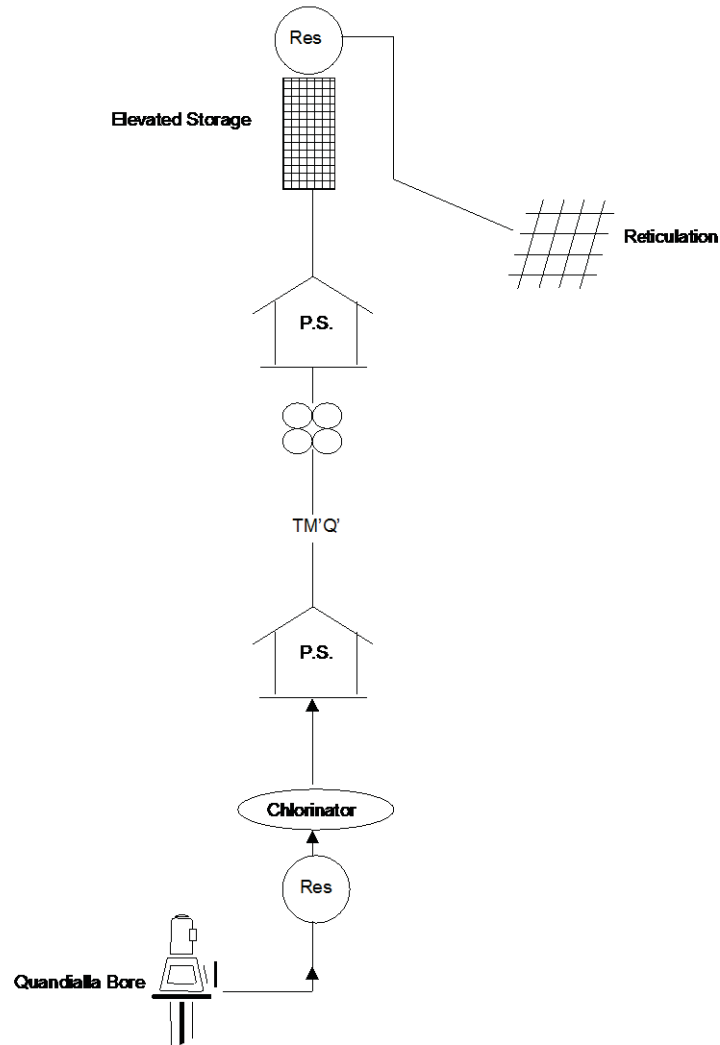


Figure 4.10: Sub-System 9.

Quandialla system consists of two bore with a reservoir and two surface pumps, Trunk Main 'Q' which delivers water from the surface pumps to on-ground storage at Quandialla village. One duty pump which takes water from the on-ground storage lifts it to the elevated storage, and then gravitates to the reticulation of Quandialla.

4.9.1 QUANDIALLA BORES

Objectives:

To pump water from the Quandialla Bore to the Bore reservoir.

Performance Requirements:

Peak Daily Demand: 1.3 ML/day

Unplanned Interruptions: Must be ready to operate when needed.

Existing Facilities:

Bore #1 Pump Grundfos SP60-6, 11kw

Bore #2 Pump Grundfos SP60-6, 11kw

Capacity:

1.3 ML/day

Criticality:

Rating: 1

With two bores a complete failure of the system is unlikely.

Deficiencies and Constraints:

- None

4.9.2 QUANDIALLA BORE RESERVOIR

Objectives:

To accept water from the Quandialla bore, store it and supply it to the Quandialla Pump Station.

Performance Requirements:

Peak Daily Input: 1.3 ML/day

Peak Daily Output: 1.3 ML/day

Unplanned Interruptions: Not more than once in seven days.

Not more than 24 hours duration.

Existing Facilities:

- 0.02 ML Reservoir (Polyethylene).
- Inlet 100mm underneath feed from bore.
- Outlet 100mm underneath to surface pumps.

Capacity:

0.02 ML

Criticality:

Rating: 1

Deficiencies and Constraints:

- Unable to direct feed surface pumps.

4.9.3 QUANDIALLA BORE CHLORINATOR

Objectives:

To disinfect the bore water before it contributes to supply.

Performance Requirements:

Peak Daily Flow: 1.3 ML/day

Chlorine Dose: 2 mg/l

Unplanned Interruptions: Must be ready to operate when needed.

Existing Facilities:

- Chlorinator (Prominent V-100 gas chlorine).
- One chlorine cylinder.
- One water supply pump.

The chlorinator consists of a chlorine gas supply gauge, a manually adjusted V-notch orifice to regulate gas flow rate, a chlorine injector and a water supply pump to supply sufficient pressure for the injector.

Capacity:

- Dose at 2 mg/l
- Disinfection of 1.3 ML/day
- 2.6 kg of chlorine per day

Criticality:

Rating: 1

Deficiencies and Constraints:

- Remote site

4.9.4 QUANDIALLA BORE SURFACE PUMPS

Objectives:

To pump water from the Quandialla Bore reservoir to the on-ground storages at the Quandialla village, via Trunk Main 'Q'.

Performance Requirements:

Peak Daily Demand: 0.8 ML/day

Unplanned Interruptions: Must be ready to operate when needed.

Existing Facilities:

The pumps are run individually, never together.

Pump #1 Southern Cross Starline 60x40x315, 18.5 kw, 2pole

Pump #1 Southern Cross Starline 60x40x315, 18.5 kw, 2pole

Capacity:

0.8 ML/day

Criticality:

Rating: 1

Quandialla Bore Surface Pumps are the only means of getting water to Quandialla village. With two pumps a complete failure of the Pump Station is unlikely.

Deficiencies and Constraints:

- None

4.9.5 TRUNK MAIN 'Q'

Objectives:

To deliver water from the Quandialla Surface Pumps to the on-ground storage at Quandialla.

Performance Requirements

Peak Daily Demand: 0.8 ML/day

Unplanned Interruptions: Must be ready to operate when needed.

Existing Facilities:

- 100mm OPVC main, 16.5 km length.

Capacity:

0.8 ML/day

Criticality:

Rating: 1

Trunk Main 'Q' is the only means of supplying water to the village of Quandialla.

Deficiencies and Constraints:

- None

4.9.6 QUANDIALLA ON-GROUND STORAGE

Objectives:

To accept water from Trunk Main 'Q', store it and supply to the booster pump when required.

Performance Requirements:

Peak Daily Input: 0.8 ML/day

Peak Daily Output: 0.8 ML/day

Unplanned Interruptions: Not more than once in seven days.
Not more than 48 hours duration.

Existing Facilities:

- 4 x 45,000 litre Polyethylene Reservoirs

Capacity:

0.18 ML

Criticality:

Rating: 3

As all four reservoirs are independent of each other, any three can be off line at any given time.

Deficiencies and Constraints:

- None

4.9.7 QUANDIALLA BOOSTER PUMP

Objectives:

To accept water from the on-ground storage and pump to the elevated storage reservoirs.

Performance Requirements:

Peak Daily Input: 0.8 ML

Peak Daily Output: 0.8 ML

Unplanned Interruptions: Must be ready to operate when needed.

Existing Facilities:

Pump: Southern Cross Starline 100x65x250, 5.5 kw, 4 pole

Capacity:

1.7 ML/day

Criticality:

Rating: 2

Quandialla Booster Pump supplies water to the elevated storage, which in turn supplies 15 metre head to the Quandialla village.

A pump failure would cause minor interruption a water can be bypassed direct into the reticulation.

Deficiencies and Constraints:

- None

4.9.8 QUANDIALLA ELEVATED STORAGE

Objectives:

To accept water from the Quandialla Booster pump and supply it to Quandialla village.

Performance Requirements:

Peak Daily Input: 1.7 ML

Peak Daily Output: 1.7 ML

Unplanned Interruptions: Must be ready to operate when needed.

Existing Facilities:

- 0.02 ML Polyethylene Reservoir
- Inlet: 100mm underneath

- Outlet: 150mm underneath

Capacity:

0.02 ML

Criticality:

Rating: 2

Reservoir supplies pressure to the Quandialla village, but can be bypassed if required.

Deficiencies and Constraints:

- None

5. OPERATING RULES

Operating rules are guidelines that help the system achieve its primary objective of “economically delivering water to customers that meets consumer needs for service, quality and reliability, doing so in an environmentally responsible manner” under varying conditions.

Specific operating rules and procedures are detailed in each facility’s Operation and Maintenance Manual.

GENERAL RULES

General operating rules govern all procedures for operating CTW facilities. Detailed below, in order of priority, they summarise the approach taken for developing more detailed operation rules.

1. Operate facilities and components in the safest possible manner to protect CTW operators and members of the public from personal risk and prevent damage to CTW, public and private property.
2. Meet NHMRC guidelines for water quality.
3. Minimise delivery costs.
4. Ensure system is 98% reliable.
5. Operate the CTW system with due diligence to ensure adverse environmental impact is minimised.

NORMAL CONDITIONS

Normal conditions are defined as the entire CTW system being satisfactorily supplied with water from Lake Rowlands. Normal conditions are usually present for most of the year, between March and December.

When operating pump stations under normal conditions, minimising pumping costs takes precedence over reservoir levels. The system is juggled to only operate pumps during low tariff periods whilst balancing supply and reservoir levels.

5.2.1 SUB-SYSTEM 1

- Monitor raw water quality in Lake Rowlands, quality at WFP’s and in reticulation systems in accordance with schedule.
- Keep level of Lake Rowlands at maximum. Only open scour valve to prevent over-topping and meet the requirements of NOW Licence.
- Operate destratification system only during spring/summer
- Maintain Millthorpe, Carcoar and Blayney area Reservoirs at adequate levels.
- At Browns Creek Pump Station, use Pump #1 as duty pump.
- At Booster #1 Pump Station, use either Pump #1 or #2 as duty pump.
- Adhere to routine and preventative maintenance schedules.

5.2.2 SUB-SYSTEM 2

- Maintain Lyndhurst, Mandurama and Garland Reservoirs at adequate levels.
- Ensure sufficient flow through Trunk Mains ‘U’, ‘V’ and ‘C’.

- Adhere to routine and preventative maintenance schedules.

5.2.3 SUB-SYSTEM 3

- Maintain Cargo, Cudal, Greys Hill and Manildra Reservoirs at adequate levels.
- Single pump operation of Cargo Pump Station.
- Adhere to routine and preventative maintenance schedules.

5.2.4 SUB-SYSTEM 4

- Maintain Moorbel Reservoir full.
- Feed supply for whole sub-system via Trunk Main 'V' and Moorbel Reservoir.
- Maintain all other Reservoirs at an adequate level.
- Adhere to routine and preventative maintenance schedules.

5.2.5 SUB-SYSTEM 5

- Adhere to routine and preventative maintenance schedules.

5.2.6 SUB-SYSTEM 6

- Adhere to routine and preventative maintenance schedules.

5.2.7 SUB-SYSTEM 7

- Keep operation of Broad Street and Trajere Pump Stations to a minimum.
- Maintain Eugowra, Hill Street, Trajere and Pyes Gap Reservoirs at an adequate level.
- Adhere to routine and preventative maintenance schedules.

5.2.8 SUB-SYSTEM 8

- Maintain all Grenfell Reservoirs at an adequate level.
- Adhere to routine and preventative maintenance schedules.

5.2.9 SUB-SYSTEM 9

- Monitor water quality from bores.
- Monitor SWL in bores.
- Maintain Quandialla reservoirs at an adequate level.
- Adhere to routine and preventative maintenance schedules.

5.3 PEAK DEMAND CONDITIONS

Peak demand conditions are defined as when demand is such that the entire CTW system is unable to be solely supplied with water from Lake Rowlands. Stand-by sources and facilities are utilised to supplement supply from Lake Rowlands. These conditions usually occur for several weeks during the summer months.

When operating pump stations under peak demand conditions, maintaining supply is more important than minimising pumping costs. The larger pumps are selected as the duty pumps to keep pumping times to a minimum whilst maintaining reservoir levels.

5.3.1 SUB-SYSTEM 1

The Council of Central Tablelands Water, at its meeting on 14th August 2013, adopted the following water restriction policy for the Lake Rowlands supply area:

Table 8: Proposed CTW Triggers & Staged Drought Supply Side Actions

Proposed Triggers for CTW	BOD Water Restriction Levels	Supply Actions
100% Bore Supply & 70% Lake Rowlands Storage Level	Level 1 Low	<ul style="list-style-type: none"> ▪ Monitor all bore capacities ▪ Monitor Lake Rowlands storage level.
100% Bore Supply & 60% Lake Rowlands Storage Level	Level 2 Moderate	<ul style="list-style-type: none"> ▪ Review alternative groundwater supply options. ▪ Review of water carting arrangement and infrastructure required to obtain water from other councils. ▪ Monitor Lake Rowlands storage level and review infrastructure required to access 'dead' storage (900 ML).
100% Bore Supply & 50% Lake Rowlands Storage Level	Level 3 High	<ul style="list-style-type: none"> ▪ Review of alternative groundwater supply options and their capacities. ▪ Review and inspection of water carting infrastructure. ▪ Review strategies to access 'dead' storage in Lake Rowlands.

Proposed Triggers for CTW	BOD Water Restriction Levels	Supply Actions
100% Bore Supply & 40% Lake Rowlands Storage Level	Level 4 Very High	<ul style="list-style-type: none"> ▪ Ensure of water carters are available and contracts are ready to operate. ▪ Prepare water carting operation systems. ▪ Contact NSW Office of Water to notify the water supply situation & ensure funding for water carting available. ▪ Perform design and if possible trial implementation process to ensure operability of Lake Rowlands “dead” storage access system. ▪ Inquire and verify the availability of water supply from alternative water sources.
100% Bore Supply & 35% Lake Rowlands Storage Level	Level 5 Extreme	<ul style="list-style-type: none"> ▪ Request for the NSW Office of Water to commence support on water carting subsidy. ▪ Inquire and verify the availability of water supply from water carting locations. ▪ Complete construction of infrastructure for accessing ‘dead’ storage in Lake Rowlands.
100% Bore Supply & 30% Lake Rowlands Storage Level	Level 6 Critical	<ul style="list-style-type: none"> ▪ Commence water carting. ▪ Access Lake Rowlands “dead” storage for emergency only.

Note: *CTW has permanent Level 1 water restrictions as a demand management measure.

Note: where "Not permitted" is shown in the table below, this should read unless stated as "at Council's discretion".

REGIONAL SYSTEM OF WATER RESTRICTIONS for BATHURST, ORANGE, DUBBO - May 2009 Review

ACTIVITY	WATER RESTRICTIONS					
	LEVEL 1 LOW	LEVEL 2 MODERATE	LEVEL 3 HIGH	LEVEL 4 VERY HIGH	LEVEL 5 EXTREME	LEVEL 6 CRITICAL
RESIDENTIAL WATER USE						
TARGET WATER CONSUMPTION	260 litres/person/day	240 litres/person/day	220litres/person/day	200 litres/person/day	160 litres/person/day	120 litres/person/day
Watering of Lawns Note: Subject to varying Summer and Winter Times	Watering systems, microsprays, drip systems, soaker hoses; non-fixed sprinklers, handheld hoses only. Summer Time between 1800-0900 hrs only daily. Winter Time 0600-1000 hrs and 1600-2200 hrs daily.	Watering systems, non-fixed sprinklers, hand held hoses, microsprays, drip systems, soaker hoses; only. Summer Time between 0600-0900 hrs and between 1800-2100 hrs every second day as per odds and evens system. Winter Time between 0700-1000 hrs and between 1600-1900 hrs every second day as per odds and evens system.	220litres/person/day Watering systems, non fixed sprinklers, hand held hoses not permitted at any time. Microsprays, drip systems, soaker hoses, only. Summer Time between 0600-0900 hrs and between 1800-2100 hrs every second day as per odds and evens system. Winter Time between 0700-1000 hrs and between 1600-1900 hrs every second day as per odds and evens system.	200 litres/person/day Not permitted	160 litres/person/day Not permitted	120 litres/person/day Not permitted

ACTIVITY		WATER RESTRICTIONS					
		LEVEL 1 LOW	LEVEL 2 MODERATE	LEVEL 3 HIGH	LEVEL 4 VERY HIGH	LEVEL 5 EXTREME	LEVEL 6 CRITICAL
RESIDENTIAL WATER USE							
Watering of Residential Gardens: Subject to varying Summer and Winter times	Watering systems, microsprays, drip systems, soaker hoses, non fixed sprinklers, hand held hoses only.	Watering systems, non fixed sprinklers, hand held hoses, microsprays, drip systems, soaker hoses, only.	Watering systems, non fixed sprinklers, hand held hoses not permitted at any time. Microsprays, drip systems, soaker hoses, only.	Watering systems, non fixed sprinklers, hand held hoses not permitted at any time. Microsprays, drip systems, soaker hoses, only.	Watering systems, non fixed sprinklers, hand held hoses not permitted at any time. Microsprays, drip systems, soaker hoses, not permitted at any time. Bucket / watering can watering only.	Watering systems, non fixed sprinklers, hand held hoses, microsprays, drip systems, soaker hoses, not permitted at any time. Bucket / watering can watering only.	Not permitted
	Summer Time between 1800-0900 hrs only daily. Winter Time 0600-1000 hrs and 1600-2200 hrs daily.	Summer Time between 0600-0900 hrs and between 1800-2100 hrs every second day as per odds and evens system. Winter Time between 0700-1000 hrs and between 1600-1900 hrs every second day as per odds and evens system.	Summer Time between 0600-0900 hrs and between 1800-2100 hrs every second day as per odds and evens system. Winter Time between 0700-1000 hrs and between 1600-1900 hrs every second day as per odds and evens system.	Summer Time between 0600-0900 hrs and between 1800-2100 hrs every second day as per odds and evens system. Winter Time between 0700-1000 hrs and between 1600-1900 hrs every second day as per odds and evens system.	Summer Time between 1800-2000 hrs only on each Wednesday and Sunday. Winter Time 1600-1800 hrs on each Wednesday and Sunday.	Summer Time between 1800-2000 hrs on Sunday only. Winter Time between 1300-1500 hrs on Sunday only.	Not to be topped up or filled.
Topping up, filling garden water features	Permitted	Permitted	Permitted	Permitted	Permitted	Not to be topped up or filled.	Not to be topped up or filled.

ACTIVITY		WATER RESTRICTIONS					
		LEVEL 1 LOW	LEVEL 2 MODERATE	LEVEL 3 HIGH	LEVEL 4 VERY HIGH	LEVEL 5 EXTREME	LEVEL 6 CRITICAL
RESIDENTIAL WATER USE							
Irrigation of new turf	Permitted for one week after laying restriction on watering lawns applies	Permitted for one week after laying restriction on watering lawns applies	Permitted for one week after laying restriction on watering lawns applies	Not permitted.	Not permitted.	Not permitted.	Not permitted.
Washing down walls or paved surfaces	Not permitted	Not permitted	Not permitted	Not permitted	Not permitted	Not permitted	Not permitted
Topping up private swimming pools/spas	Permitted	Only between hours of 0700-0900 and between 1800-2000 hrs, every day.	Only between hours of 0700-0900 and between 1800-2000 hrs, every day provided pool covers are used	Only between hours of 0700-0900 and between 1800-2000 hrs, every day. Pool covers must be used.	Not permitted	Not permitted	Not permitted
First fill of private swimming pools	Permitted	Only between hours of 0700-0900 and between 1800-2000 hrs, every day	Only with Council permission and provided pool covers are used.	Only with Council permission and after water savings elsewhere within property. Covers must be used.	Not permitted	Not permitted	Not permitted
Washing cars at home	Permitted with bucket and rinse with trigger hose on lawn at any time.	Permitted with bucket and rinse with trigger hose on lawn between 0900-1200 hrs any day.	Permitted with bucket only on lawn between 0900-1200 hrs any day.	Permitted with bucket only on lawn between 0900-1200 hrs any day.	Not permitted	Not permitted	Not permitted

ACTIVITY	WATER RESTRICTIONS					
	LEVEL 1 LOW	LEVEL 2 MODERATE	LEVEL 3 HIGH	LEVEL 4 VERY HIGH	LEVEL 5 EXTREME	LEVEL 6 CRITICAL
RESIDENTIAL WATER USE						
Baths, showers	Permitted	Permitted	Permitted	Five (5) minute showers, one bath per person per day	Three (3) minute showers, one bath (100 mm depth) per person per day	Three (3) minute showers, one bath (100 mm depth) per person per day
Washing of clothes	Permitted	Permitted	Full loads only encouraged.	Full loads only permitted.	Full loads only permitted.	Two full loads of clothes per week
Use of evaporative air conditioners	Permitted	Permitted	Permitted	Permitted only 0700-2400 hrs daily	Permitted only 0700-2400 hrs daily, exemptions may be granted to aged accommodation or nursing homes.	Permitted only 1800-2200 hrs daily, exemptions may be granted to aged accommodation or nursing homes.
Inflatable or temporary children pools	Permitted	Permitted	Permitted	Permitted	Not permitted	Not permitted

ACTIVITY	WATER RESTRICTIONS					
	LEVEL 1 LOW	LEVEL 2 MODERATE	LEVEL 3 HIGH	LEVEL 4 VERY HIGH	LEVEL 5 EXTREME	LEVEL 6 CRITICAL
NON - RESIDENTIAL WATER USE						
Watering of Lawns Note: Subject to varying Summer and Winter Times	Watering systems, microsprays, drip systems, soaker hoses, non-fixed sprinklers, handheld hoses only. Summer Time between 1800-0900 hrs only daily. Winter Time 0600-1000 hrs and 1600-2200 hrs daily.	Watering systems, non-fixed sprinklers, hand held hoses, drip microsprays, drip systems, soaker hoses, only. Summer Time between 0600-0900 hrs and between 1800-2100 hrs every second day as per odds and evens system. Winter Time between 0700-1000 hrs and between 1600-1900 hrs every second day as per odds and evens system.	Watering systems, non fixed sprinklers, hand held hoses not permitted at any time. Microsprays, drip systems, soaker hoses, only. Summer Time between 0600-0900 hrs and between 1800-2100 hrs every second day as per odds and evens system. Winter Time between 0700-1000 hrs and between 1600-1900 hrs every second day as per odds and evens system.	Not permitted	Not permitted	Not permitted

ACTIVITY	WATER RESTRICTIONS					
	LEVEL 1 LOW	LEVEL 2 MODERATE	LEVEL 3 HIGH	LEVEL 4 VERY HIGH	LEVEL 5 EXTREME	LEVEL 6 CRITICAL
NON - RESIDENTIAL WATER USE						
Watering of Gardens Note: Subject to varying Summer and Winter times	Watering systems, microsprays, drip systems, soaker hoses, non fixed sprinklers, hand held hoses only. Summer Time between 1800-0900 hrs only daily. Winter Time 0600-1000 hrs and 1600-2200 hrs daily.	Watering systems, non fixed sprinklers, hand held hoses, microsprays, drip systems, soaker hoses, only. Summer Time between 0600-0900 hrs and between 1800-2100 hrs every second day as per odds and evens system. Winter Time between 0700-1000 hrs and between 1600-1900 hrs every second day as per odds and evens system.	Watering systems, non fixed sprinklers, hand held hoses not permitted at any time. Microsprays, drip systems, soaker hoses, only. Summer Time between 0600-0900 hrs and between 1800-2100 hrs every second day as per odds and evens system. Winter Time between 0700-1000 hrs and between 1600-1900 hrs every second day as per odds and evens system.	Watering systems, non fixed sprinklers, hand held hoses not permitted at any time. Microsprays, drip systems, soaker hoses, only. Summer Time between 1800-2000 hrs only on each Wednesday and Sunday. Winter Time 1600-1800 hrs on each Wednesday and Sunday.	Watering systems, non fixed sprinklers, hand held hoses, microsprays, drip systems, soaker hoses, not permitted at any time. Bucket / watering can watering only. Summer Time between 1800-2000 hrs on Sunday only. Winter Time between 1300-1500 hrs on Sunday only.	Not permitted
Topping up public swimming pools/spas, including those in motels etc.	Permitted	Only between of 0700-0900 and between 1800-2000 hrs, every day.	Only between hours of 0700-0900 and between 1800-2000 hrs, every day provided pool covers are used	Only between hours of 0700-0900 and between 1800-2000 hrs, every day. Pool covers must be used.	Not permitted	Not permitted

ACTIVITY	WATER RESTRICTIONS					
	LEVEL 1 LOW	LEVEL 2 MODERATE	LEVEL 3 HIGH	LEVEL 4 VERY HIGH	LEVEL 5 EXTREME	LEVEL 6 CRITICAL
NON - RESIDENTIAL WATER USE						
First fill of public swimming pools/spas, including those in motels etc.	Permitted	Only between hours of 0700-0900 and between 1800-2000 hrs, every day	Only with Council permission	Only with Council permission and after water savings elsewhere within property. Covers must be used.	Not permitted	Not permitted
Turf farm irrigation, market gardens	Permitted	Permitted	Irrigation only between 2000-0800 hrs. Business must prepare WSAP.	Business must implement and comply with WSAP	Not permitted	Not permitted
Irrigation of new turf on non-residential premises	Permitted for one week after laying after which level 1 restriction on watering lawns applies	Permitted for one week after laying after which level 2 restriction on watering lawns applies	Permitted for one week after laying after which level 3 restriction on watering lawns applies	Not permitted.	Not permitted.	Not permitted.
Public car and truck wash facilities	Permitted	Permitted	Permitted, but business must prepare WSAP.	Business must implement and comply with WSAP	Business must implement and comply with WSAP	Not permitted.
Construction industry e.g. mortar or concrete mix	Permitted	Permitted	Permitted	Permitted	Permitted	Not permitted.

ACTIVITY	WATER RESTRICTIONS					
	LEVEL 1 LOW	LEVEL 2 MODERATE	LEVEL 3 HIGH	LEVEL 4 VERY HIGH	LEVEL 5 EXTREME	LEVEL 6 CRITICAL
NON - RESIDENTIAL WATER USE						
Construction - wash down, paint prep, curling.	Permitted	Permitted	Permitted, but business must prepare WSAP.	Business must implement and comply with WSAP	Business must implement and comply with WSAP	Not permitted.
Cleaning - exterior	Permitted with trigger hoses, any time.	Permitted with pressure trigger hoses, any time.	Permitted with pressure trigger hoses. Business must prepare WSAP.	Business must implement and comply with WSAP	Business must implement and comply with WSAP	Not permitted.
Commercial or Government nurseries	Permitted	Permitted	Permitted, but business must prepare WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.	Not permitted.
Abattoirs	Permitted	Permitted	Permitted, but business must prepare WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.	Not permitted.
Food or pet food production	Permitted	Permitted	Permitted, but business must prepare WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.	Not permitted.
Canneries	Permitted	Permitted	Permitted, but business must prepare WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.	Not permitted.
Pet care	Permitted	Permitted	Permitted, but business must prepare WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.

ACTIVITY	WATER RESTRICTIONS					
	LEVEL 1 LOW	LEVEL 2 MODERATE	LEVEL 3 HIGH	LEVEL 4 VERY HIGH	LEVEL 5 EXTREME	LEVEL 6 CRITICAL
NON - RESIDENTIAL WATER USE						
Public water features	Permitted	Permitted	Permitted, but WSAP must be prepared.	WSAP must be implemented.	WSAP must be implemented.	Not permitted.
Child care	Permitted	Permitted	Permitted, but business must prepare WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.
Public parks, gardens, aviaries, plant houses, zoos	Permitted	Permitted	Permitted, but business must prepare WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.	Not permitted.
Schools, technical colleges, colleges, universities	Permitted	Permitted	Permitted, but business must prepare WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.	Not permitted.
Hospitals, hospices, nursing homes, rehab centres	Permitted	Permitted	Permitted, but business must prepare WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.
Aged accommodation	Permitted	Permitted	Permitted, but business must prepare WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.
Motels, caravan parks, cabins	Permitted	Permitted	Permitted, but business must prepare WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.	Not permitted.

ACTIVITY	WATER RESTRICTIONS					
	LEVEL 1 LOW	LEVEL 2 MODERATE	LEVEL 3 HIGH	LEVEL 4 VERY HIGH	LEVEL 5 EXTREME	LEVEL 6 CRITICAL
NON - RESIDENTIAL WATER USE						
Hotels, registered clubs	Permitted	Permitted	Permitted, but business must prepare WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.	Not permitted.
Businesses with cooling towers	Permitted	Permitted	Permitted, but business must prepare WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.	Not permitted.

NOTES:**ODDS & EVENS SYSTEM EXPLAINED**

- This means that if the street number of your property is odd you can water in accordance with the restrictions on odd days.
- If your property has an even number you can water in accordance with the restrictions on even days.
- If your property has a range of street numbers then it should be treated as odd or even as per the first number in the range. For example if your property is 12-15 Smith Street then you can water on even days in accordance with the restrictions.
- If your property has no street number then it should be treated as an even property. For example if your property is "Tara" then you can water on even days in accordance with the restrictions.

OTHER SOURCES OF WATER

These restrictions are restrictions that Council is placing on the use of its potable water supply. If the restrictions say "Not permitted" for a particular use, this means that Council's potable water supply cannot be used for this purpose. Water from another source, however, could be used for this purpose.

TIMES

The times quoted in the restrictions are based on a 24 hour clock. For example, if the restrictions state 2200 hrs it is equivalent to 10 pm.

- Summer Time - refers to Daylight Saving period 2.00am Eastern Standard Time first Sunday in October to Eastern Daylight Saving Time 3.00am first Sunday in April
- Winter Time - refers to the period outside of Daylight Saving Time

WSAP

This refers to a Water Savings Action Plan, an enterprise specific plan to adopt water efficiency prepared in accordance with "Guidelines for Water Savings Action Plans", NSW Office of Water, October 2005. A copy of this document is now available from NSW Office of Water.

Further water restrictions may permit the continued use of water for that activity

At certain levels of restrictions a business may be required to prepare a WSAP. The completed WSAP but only if the business strictly complies with its approved WSAP.

5.3.2 SUB-SYSTEM 2

- Monitor all reservoir levels and adjust feed set-ups where necessary.

5.3.3 SUB-SYSTEM 3

- Operate Pumps at Canomodine Pump Station if level of Greys Hill Reservoir is below 50%.
- Operate both pumps at Cargo Pump Station.
- If demand in Cudal is very high then operate Cudal Pump Station.
- Monitor all reservoir levels and adjust feed set-ups where necessary.
- Monitor chlorine residuals maintain at or near 1.0 mg/l

5.3.4 SUB-SYSTEM 4

- Take in water through Trunk Main 'V' and Canowindra off-take if Bangaroo Bore/Gooloogong Bore is being used to supplement supply to Canowindra.
- Adjust PRV 9 to allow sufficient flow into Trunk Main 'U'.
- Monitor all reservoir levels and adjust feed set-ups where necessary.

5.3.5 SUB-SYSTEM 5

- Boost supply to Canowindra AND Eugowra, use Pump #1 OR #2.
- Boost supply to Canowindra ONLY - if demand in Canowindra is very high, use Pumps #1 AND #2.
- Boost supply to Grenfell ONLY - use Pumps #1 AND #2.
- See Operation and Maintenance Manual for full procedure.

5.3.6 SUB-SYSTEM 6

- Boost supply to Grenfell ONLY - use Pump #1 OR Pump #2.
- Boost supply to Eugowra ONLY - use Pump #1 or Pump #2.
- Boost supply to Grenfell AND Eugowra - use Pump #1 OR #2
- See Operation and Maintenance Manual for full procedure.

5.3.7 SUB-SYSTEM 7

- Adjust flow into Trunk Main 'L' at Old River Pump House.
- Operate Trunk Main 'L' booster as required.
- Monitor all reservoir levels and adjust feed set-ups where necessary.
- Operate Broad Street Booster as required.
- Monitor Chlorine residuals maintain at or near 1.0 mg/l

5.3.8 SUB-SYSTEM 8

- Boost supply via Trunk Main 'K' by operating McDonalds Lane Pump Station.

- Monitor all reservoir levels and adjust feed set-ups where necessary.
- Monitor Chlorine residuals maintain at or near 1.0 mg/l

5.3.9 SUB-SYSTEM 9

- Supply and boost water to Quandialla via TM 'Q'.
- Monitor all reservoir levels and adjust feed set-ups where necessary.
- Monitor Chlorine residuals maintain at or near 0.5 mg/l

5.4 ABNORMAL CONDITIONS

Abnormal conditions are caused by major main breaks, mechanical failures, prolonged drought conditions, planned maintenance and other interruptions that require the operation of the system to be altered.

5.4.1 DROUGHT

- Apply consumption restrictions.
- Increase monitoring of water quality at Lake Rowlands.
- Maximise use of stand-by, groundwater resources.
- Prevent use of standpipes.

5.4.2 WATER FILTRATION PLANTS

- Notify consumers of possible quality problems.
- Treat repair work of major WFP components as high priority.
- Increase monitoring of water quality to help prevent infringements of the water quality guidelines.
- Repair of chlorinator is high priority - restore operation within 2 hours.

5.4.3 PUMP STATIONS

If Pump Station has duty / stand-by facilities;

- Duty failure - switch to stand-by.
- Repair duty pump within three working days.

If Pump Station has no duty / stand-by facilities;

- Attempt to maximise existing supply or obtain alternative supply.
- Repair pump within two working days.

Planned maintenance should not affect consumers for more than 8 hours duration, twice every month.

5.4.4 TRUNK MAINS

- Repair breaks in accordance with criticality and priority response times.

- Attempt to obtain alternative supply.

Planned maintenance should not affect consumers for more than 8 hours duration, twice every month.

Note: An exception to the planned maintenance interruption rule is the annual flushing of Trunk Mains. During the flushing program, in which all Trunk Mains are flushed in sequence from Lake Rowlands to Grenfell, supply is not guaranteed for a maximum of 5 days. Industrial consumers are given 7 days notice and domestic consumers are given 48 hours notice.

5.4.5 RESERVOIRS

- Bypass reservoir where possible.
- Repair failure with high priority if preventing supply from reaching reticulation system.
- Attempt to obtain alternative supply.

Planned maintenance should not affect consumers for more than 8 hours duration, twice every month.

5.5 DISASTER CONDITIONS

Disaster conditions are defined as life threatening failures of CTW facilities.

5.5.1 LAKE ROWLANDS DAM FAILURE

Complete, partial or even potential failure of Lake Rowlands Dam is a disaster.

Failure of the dam wall at Lake Rowlands would endanger many lives and cause extensive property damage.

Grenfell, Eugowra, Canowindra and Cudal can all be supplied by using stand-by groundwater facilities.

Blayney's domestic consumers could be supplied, with heavy consumption restrictions, with water from Blayney Well.

All other towns and consumers would be without water supply.

A disaster plan has been developed for Blayney Shire and is described in the 'Blayney Shire DISPLAN' document.

5.5.2 CHEMICAL ACCIDENTS

Chlorine is the most dangerous of the chemicals handled by CTW personnel. Transport, storage and handling of chlorine (and other chemicals) are done in accordance with 'Dangerous Goods' and/or 'Hazardous Substances' regulations by trained and licenced personnel.

Information on first aid, containment of leaks and other emergency procedures is also given in the 'Chemical Safety Data Sheets' that are kept at storage facilities, transport trucks and by personnel.

5.5.3 SEVERE DROUGHT

If the water level of Lake Rowlands falls to a level below that of the middle-level draw-off point of the outlet tower, then it is considered an emergency. The lower level draw-off point is too close to the floor of the dam to be used. A portable, barge-mounted pump is used to move water from the dam to the outlet works.

Appendix B – 30 Year Financial & Capital Works Plan

CENTRAL TABLELANDS Water - 30 Year Financial Plan

SCHEDULES	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34	34/35	35/36	36/37	37/38	38/39	39/40	40/41	41/42	42/43
Management Expenses	1,013,334	1,175,617	1,057,710	1,077,395	1,109,717	1,143,008	1,177,299	1,207,840	1,237,471	1,274,595	1,312,833	1,352,218	1,392,784	1,434,568	1,477,605	1,521,933	1,567,591	1,614,619	1,663,007	1,712,949	1,764,337	1,817,267	1,871,785	1,927,939	1,985,777	2,045,351	2,106,711	2,169,912	2,235,010	2,302,060
Salaries	403,768	423,137	434,801	447,845	461,281	475,119	489,273	504,064	519,755	534,751	550,793	567,317	584,337	601,867	619,923	638,520	657,676	677,406	697,728	718,660	740,220	762,427	785,299	808,858	833,124	858,118	883,861	910,377	937,689	966,819
Employee Leave Entitlements	61,806	160,493	64,150	66,074	68,056	70,098	72,201	74,367	76,598	78,896	81,263	83,701	86,212	88,798	91,462	94,206	97,032	99,943	102,941	106,029	109,210	112,487	115,861	119,337	122,917	126,605	130,403	134,315	138,344	142,495
Employee Overhead Expenses	45,778	48,652	50,111	39,272	40,450	41,664	42,913	44,201	45,527	46,893	48,300	49,749	51,241	52,778	54,362	55,992	57,672	59,402	61,184	63,020	64,911	66,858	68,864	70,929	73,057	75,249	77,507	79,832	82,227	84,694
Management Travelling Expenses	33,600	36,750	37,853	38,988	40,158	41,362	42,603	43,881	45,198	46,554	47,950	49,389	50,871	52,397	53,969	55,588	57,255	58,973	60,742	62,564	64,441	66,375	68,366	70,417	72,529	74,705	76,946	79,255	81,632	84,081
Office Building Expenses	28,761	34,296	35,325	36,385	37,476	38,600	39,758	40,951	42,180	43,445	44,748	46,091	47,474	48,898	50,365	51,876	53,432	55,035	56,686	60,138	61,942	63,800	65,715	67,686	69,717	71,808	73,962	76,181	78,467	
Office Equipment Expenses	62,875	61,887	63,743	65,656	67,625	71,744	73,896	76,133	78,457	83,171	85,666	88,238	93,609	96,448	99,630	102,269	105,338	108,919	111,774	115,128	118,582	122,139	125,803	129,577	133,465	137,468	141,593	145,947	150,632	
Sundry Administration Expenses	269,675	304,785	265,429	270,301	278,410	286,763	295,386	299,650	308,584	317,897	327,718	337,034	347,145	357,559	368,283	379,753	402,436	414,509	426,945	439,753	462,534	480,530	494,946	509,794	520,088	540,841	557,066	573,778	593,233	615,738
Chairman's Allowance	14,420	14,781	15,224	15,681	16,151	16,636	17,135	17,649	18,178	18,723	19,285	19,864	20,460	21,073	21,706	22,357	23,028	23,718	24,430	25,163	25,918	26,695	27,496	28,321	29,171	30,046	30,947	31,875	32,832	33,817
Members Fees	52,713	54,013	55,634	57,303	59,022	60,792	62,616	64,495	66,429	68,422	70,475	72,589	74,767	77,010	79,320	81,700	84,151	86,675	89,276	91,954	94,712	97,554	100,480	103,495	106,600	109,798	113,092	116,484	119,979	123,578
Members Travelling & Subsistence	4,400	4,400	4,532	4,668	4,808	4,952	5,101	5,254	5,411	5,574	5,741	5,913	6,091	6,273	6,462	6,655	6,855	7,061	7,273	7,491	7,715	7,947	8,185	8,431	8,684	8,944	9,213	9,489	9,774	10,067
Members Sundry Expenses	2,628	2,628	2,706	2,788	2,871	2,957	3,046	3,136	3,230	3,327	3,427	3,530	3,636	3,745	3,857	3,973	4,092	4,215	4,341	4,472	4,606	4,744	4,886	5,033	5,184	5,339	5,500	5,665	5,835	
Delegates Expenses	9,236	7,570	7,797	8,031	8,272	8,520	8,776	9,039	9,310	9,589	9,877	10,173	10,479	10,793	11,117	11,450	11,794	12,148	12,512	12,887	13,274	13,672	14,082	14,505	14,940	15,388	15,850	16,325	16,815	17,320
Subscriptions	23,674	23,226	23,406	24,404	25,136	25,890	26,667	27,467	27,781	28,434	29,107	29,800	24,514	25,250	26,007	26,787	27,591	28,419	29,271	30,149	31,054	31,985	32,945	33,933	34,951	36,000	37,080	38,192	39,338	40,518
Technical & Supervision Expenses	213,534	218,195	224,741	397,644	228,222	219,946	226,332	232,916	239,904	246,572	254,514	262,149	270,014	278,114	286,488	295,051	303,903	313,020	322,411	332,083	342,045	352,307	362,876	373,762	384,975	396,524	408,420	420,673	433,293	446,292
Salaries	105,969	109,119	112,393	115,764	119,237	122,814	126,499	130,294	134,203	138,229	142,376	146,647	151,046	155,578	160,245	165,052	170,004	175,104	180,357	185,768	191,341	197,081	202,994	209,083	215,356	221,817	228,471	235,325	242,385	249,656
Employee Leave Entitlements	22,977	23,108	23,801	20,470	20,743	21,366	22,007	22,667	23,347	24,047	24,769	25,512	26,277	27,065	27,877	28,714	29,575	30,462	31,376	32,318	33,287	34,286	35,314	36,374	37,465	38,589	39,747	40,939	42,167	43,432
Employee Overhead Expenses	9,788	9,244	9,521	(5,986)	(6,166)	(6,351)	(6,541)	(6,738)	(6,940)	(7,148)	(7,362)	(7,583)	(7,811)	(8,045)	(8,286)	(8,535)	(8,791)	(9,055)	(9,326)	(9,606)	(9,894)	(10,191)	(10,497)	(10,812)	(11,136)	(11,470)	(11,814)	(12,169)	(12,534)	(12,910)
Travelling Expenses	19,800	18,000	18,540	19,096	19,669	20,259	20,867	21,493	22,138	22,802	23,486	24,190	24,916	25,664	26,434	27,227	28,043	28,885	29,751	30,644	31,563	32,510	33,485	34,490	35,525	36,590	37,688	38,819	39,983	41,183
Sundry Technical Expenses	55,000	58,724	60,486	62,300	64,178	66,157	68,201	70,316	72,500	74,761	77,104	79,534	82,052	84,664	87,366	90,165	93,059	96,048	99,132	102,311	105,585	108,954	112,418	115,976	120,627	124,371	128,210	132,145	136,176	140,304
Operational Expenses	21,895,583	22,424,346	22,844,877	23,165,528	23,488,127	23,813,591	24,142,930	24,476,253	24,814,571	25,157,885	25,506,197	25,859,507	26,217,816	26,581,124	26,949,431	27,322,737	27,701,044	28,084,351	28,471,658	28,862,965	29,258,272	29,657,579	30,060,886	30,468,193	30,879,500	31,293,807	31,712,114	32,134,421	32,560,728	32,991,035
Operations Staff Leave Entitlements	132,662	131,906	135,863	139,939	144,142	148,474	152,943	157,552	162,306	167,202	172,245	177,434	182,774	188,264	193,902	199,688	205,629	211,732	217,988	224,407	230,988	237,730	244,633	251,703	258,948	266,377	273,990	281,787	289,770	297,939
Operations Staff Overheads	68,758	80,528	83,944	105,628	108,797	112,861	116,922	121,085	125,352	129,722	134,194	138,770	143,451	148,237	153,128	158,124	163,226	168,436	173,756	179,285	184,923	190,670	196,527	202,494	208,571	214,758	221,055	227,463	233,982	240,611
Meter Reading	75,356	74,205	76,431	78,724	81,085	83,518	86,023	88,604	91,262	94,000	96,820	99,725	102,716	105,798	108,972	112,241	115,608	119,077	122,649	126,328	130,118	134,022	138,042	142,184	146,449	150,843	155,368	160,029	164,830	169,775
Depot Expenses	68,358	71,809	74,066	76,288	78,577	80,934	83,362	85,863	88,439	91,092	93,824	96,639	99,538	102,525	105,600	108,768	112,031	115,392	118,854	122,420	126,092	129,875	133,771	137,794	141,938	146,176	150,561	155,078	159,730	164,522
Work Health & Safety (WHS)	5,346	17,598	5,671	5,841	6,016	6,197	6,383	6,574	6,771	6,974	7,184	7,399	7,621	7,850	8,085	8,328	8,578	8,835	9,100	9,373	9,654	9,944	10,242	10,549	10,866	11,192	11,528	11,873	12,230	12,597
Dams & Weirs	96,139	109,982	114,497	115,872	119,348	122,829	126,617	130,415	134,228	138,258	142,508	146,783	151,187	155,723	160,394	165,206	170,162	175,267	180,525	185,941	191,519	197,265	203,183	209,278	215,557	222,023	228,684	235,544	242,611	249,889
Mains Maintenance	450,784	472,784	486,967	501,576	516,624	532,122	548,086	564,528	581,464	598,908	616,876	635,382	654,443	674,077	694,299	715,128	736,582	758,679	781,439	804,883	829,029	853,900	879,517	905,902	933,080	961,072	989,904	1,019,601	1,050,189	1,081,695
Reservoirs - Operation Expenses	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Maintenance Expenses	38,394	39,192	40,368	41,579	42,826	44,111	45,434	46,797	48,201	49,647	51,137	52,671	54,251	55,879	57,555	59,282	61,060	62,892	64,779	66,722	68,724	70,785	72,909	75,096	77,349	79,669	82,059	84,521	87,057	89,669
Pumping Station - Operation Expenses	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Maintenance Expenses	76,612	80,472	82,886	85,373	87,934	90,572	93,289	96,088	98,970	101,939	104,998	108,148	111,392	114,734	118,176	121,721	1													

CENTRAL TABLELANDS *Water* - 30 Year Financial Plan

OPERATING STATEMENT **13/14** **14/15** **15/16** **16/17** **17/18** **18/19** **19/20** **20/21** **21/22** **22/23** **23/24** **24/25** **25/26** **26/27** **27/28** **28/29** **29/30** **30/31** **31/32** **32/33** **33/34** **34/35** **35/36** **36/37** **37/38** **38/39** **39/40** **40/41** **41/42** **42/43**

Administration Salaries	403,768	422,137	434,801	447,845	461,281	475,119	489,373	504,054	519,175	534,751	550,793	567,317	584,337	601,867	619,923	638,520	657,676	677,406	697,728	718,660	740,220	762,427	785,299	808,858	833,124	858,118	883,861	910,377	937,689	965,819
General Manager	141,848	146,090	150,473	154,987	159,637	164,426	169,358	174,439	179,672	185,063	190,614	196,333	202,223	208,289	214,538	220,974	227,604	234,432	241,465	248,709	256,170	263,855	271,771	279,924	288,321	296,971	305,880	315,057	324,508	334,243
Administration Staff	261,920	276,047	284,329	292,858	301,644	310,693	320,014	329,615	339,503	349,688	360,179	370,984	382,114	393,577	405,384	417,546	430,072	442,975	456,264	469,952	484,050	498,572	513,529	528,935	544,803	561,147	577,981	595,321	613,180	631,576
Administration Leave Entitlements	61,806	160,493	64,150	66,074	68,056	70,098	72,201	74,367	76,598	78,896	81,263	83,701	86,212	88,798	91,462	94,206	97,032	99,943	102,941	106,029	109,210	112,487	115,861	119,337	122,917	126,605	130,403	134,315	138,344	142,495
Annual Leave	34,703	35,178	36,233	37,320	38,440	39,593	40,781	42,004	43,265	44,563	45,899	47,276	48,695	50,156	51,660	53,210	54,806	56,451	58,144	59,888	61,685	63,536	65,442	67,405	69,427	71,510	73,655	75,865	78,141	80,485
Long Service Leave	27,103	125,315	27,916	28,754	29,616	30,505	31,420	32,362	33,333	34,333	35,363	36,424	37,517	38,642	39,802	40,996	42,226	43,492	44,797	46,141	47,525	48,951	50,420	51,932	53,490	55,095	56,748	58,450	60,204	62,010
Administration - Overhead	45,778	48,652	50,111	39,272	40,450	41,664	42,913	44,201	45,527	46,893	48,300	49,749	51,241	52,778	54,362	55,992	57,672	59,402	61,184	63,020	64,911	66,858	68,864	70,929	73,057	75,249	77,507	79,832	82,227	84,694
Payroll Tax	12,936	14,131	14,555	14,992	15,441	15,905	16,382	16,873	17,379	17,901	18,438	18,991	19,561	20,147	20,752	21,374	22,016	22,676	23,356	24,057	24,779	25,522	26,288	27,076	27,889	28,725	29,587	30,475	31,389	32,331
Fringe Benefits Tax	6,000	8,000	8,240	8,487	8,742	9,004	9,274	9,552	9,839	10,134	10,438	10,751	11,074	11,406	11,748	12,101	12,464	12,838	13,223	13,619	14,028	14,449	14,882	15,329	15,789	16,262	16,750	17,253	17,770	18,303
Training Expenses	6,000	7,985	8,225	8,471	8,725	8,987	9,257	9,535	9,821	10,115	10,419	10,731	11,053	11,385	11,726	12,078	12,440	12,814	13,198	13,594	14,002	14,422	14,854	15,300	15,759	16,232	16,719	17,220	17,737	18,269
Workers Compensation Insurance	12,147	12,670	13,050	13,442	13,845	14,260	14,688	15,129	15,583	16,050	16,531	17,027	17,538	18,064	18,606	19,165	19,739	20,332	20,942	21,570	22,217	22,883	23,570	24,277	25,005	25,756	26,528	27,324	28,144	28,988
Superannuation	46,434	49,400	50,882	40,066	41,268	42,506	43,781	45,095	46,447	47,841	49,276	50,754	52,277	53,845	55,461	57,125	58,838	60,603	62,422	64,294	66,223	68,210	70,256	72,364	74,535	76,771	79,074	81,446	83,889	86,406
Sick Leave Insurance	3,071	1,146	1,180	1,216	1,252	1,290	1,329	1,368	1,409	1,452	1,495	1,540	1,586	1,634	1,683	1,733	1,785	1,839	1,894	1,951	2,010	2,070	2,132	2,196	2,262	2,330	2,399	2,471	2,546	2,622
less Contributions to Admin.Overheads	(40,810)	(44,680)	(46,021)	(47,402)	(48,824)	(50,288)	(51,797)	(53,351)	(54,951)	(56,600)	(58,298)	(60,047)	(61,848)	(63,704)	(65,615)	(67,583)	(69,611)	(71,699)	(73,850)	(76,066)	(78,348)	(80,698)	(83,119)	(85,612)	(88,181)	(90,826)	(93,551)	(96,358)	(99,248)	(102,226)
Administration Travelling	33,600	36,750	37,853	38,988	40,158	41,362	42,603	43,881	45,198	46,554	47,950	49,389	50,871	52,397	53,969	55,588	57,255	58,973	60,742	62,564	64,441	66,375	68,366	70,417	72,529	74,705	76,946	79,255	81,632	84,081
General Manager	17,100	17,550	18,077	18,619	19,177	19,753	20,345	20,956	21,584	22,232	22,899	23,586	24,293	25,022	25,773	26,546	27,342	28,163	29,007	29,878	30,774	31,697	32,648	33,628	34,636	35,676	36,746	37,848	38,984	40,153
Administration Staff	16,500	19,200	19,776	20,369	20,980	21,610	22,258	22,926	23,614	24,322	25,052	25,803	26,577	27,375	28,196	29,042	29,913	30,810	31,735	32,687	33,667	34,677	35,718	36,789	37,893	39,030	40,201	41,407	42,649	43,928

CENTRAL TABLELANDS Water - 30 Year Financial Plan

OPERATING STATEMENT	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34	34/35	35/36	36/37	37/38	38/39	39/40	40/41	41/42	42/43
Administration Building	28,761	34,296	35,325	36,385	37,476	38,600	39,758	40,951	42,180	43,445	44,748	46,091	47,474	48,898	50,365	51,876	53,432	55,035	56,686	58,386	60,138	61,942	63,800	65,715	67,686	69,717	71,808	73,962	76,181	78,467
Building M & R	4,506	4,683	4,823	4,968	5,117	5,271	5,429	5,592	5,759	5,932	6,110	6,293	6,482	6,677	6,877	7,083	7,296	7,515	7,740	7,972	8,211	8,458	8,711	8,973	9,242	9,519	9,805	10,099	10,402	10,714
Office Cleaning	15,055	16,057	16,539	17,035	17,546	18,072	18,614	19,173	19,748	20,341	20,951	21,579	22,227	22,893	23,580	24,288	25,016	25,767	26,540	27,336	28,156	29,001	29,871	30,767	31,690	32,641	33,620	34,628	35,667	36,737
Electricity & Gas	7,000	11,192	11,528	11,874	12,230	12,597	12,975	13,364	13,765	14,178	14,603	15,041	15,492	15,957	16,436	16,929	17,437	17,960	18,499	19,054	19,625	20,214	20,821	21,445	22,089	22,751	23,434	24,137	24,861	25,607
Council Rates	1,720	1,884	1,941	1,999	2,059	2,120	2,184	2,250	2,317	2,387	2,458	2,532	2,608	2,686	2,767	2,850	2,935	3,023	3,114	3,207	3,304	3,403	3,505	3,610	3,718	3,830	3,945	4,063	4,185	4,310
Sundry Building Expenses	480	480	494	509	525	540	556	573	590	608	626	645	664	684	705	726	748	770	793	817	842	867	893	920	947	976	1,005	1,035	1,066	1,098
Office Equipment	62,875	61,887	63,743	65,656	67,625	69,654	71,744	73,896	76,113	78,396	80,748	83,171	85,666	88,236	90,883	93,609	96,418	99,310	102,289	105,358	108,519	111,774	115,128	118,582	122,139	125,805	129,577	133,465	137,468	141,593
Equipment M & R	12,660	13,302	13,701	14,112	14,536	14,972	15,421	15,884	16,360	16,851	17,356	17,877	18,413	18,966	19,535	20,121	20,724	21,346	21,987	22,646	23,325	24,025	24,746	25,488	26,253	27,041	27,852	28,687	29,548	30,434
Computer Hardware & Software Support	42,445	43,435	44,738	46,080	47,462	48,886	50,353	51,863	53,419	55,022	56,672	58,372	60,124	61,927	63,785	65,699	67,670	69,700	71,791	73,945	76,163	78,448	80,801	83,225	85,722	88,294	90,942	93,671	96,481	99,375
Computer & Copier Lease Payments	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Computer Sundry Expenses	7,750	5,130	5,305	5,484	5,628	5,796	5,970	6,149	6,334	6,524	6,720	6,921	7,129	7,345	7,569	7,804	8,044	8,289	8,539	8,794	9,054	9,319	9,589	9,864	10,144	10,429	10,718	11,011	11,308	11,608
Other Administration Expenses	269,675	304,785	262,429	270,301	278,410	286,765	295,366	299,450	308,334	317,687	327,218	337,034	347,145	357,559	368,286	379,335	390,715	402,436	414,509	426,945	439,753	452,946	466,534	480,530	494,946	509,794	525,088	540,841	557,066	573,778
Advertising	6,000	6,000	6,180	6,365	6,556	6,753	6,956	7,164	7,379	7,601	7,829	8,063	8,305	8,555	8,811	9,076	9,348	9,628	9,917	10,215	10,521	10,837	11,162	11,497	11,842	12,197	12,563	12,940	13,328	13,728
Printing & Stationery	23,187	23,444	24,116	24,840	25,585	26,353	27,143	27,958	28,796	29,660	30,550	31,466	32,410	33,383	34,384	35,416	36,478	37,573	38,700	39,861	41,057	42,288	43,557	44,864	46,210	47,596	49,024	50,494	52,009	53,570
Postage & Courier Charges	14,000	15,400	15,862	16,338	16,828	17,333	17,853	18,388	18,940	19,508	20,094	20,696	21,317	21,957	22,615	23,294	23,993	24,712	25,454	26,217	27,004	27,814	28,649	29,508	30,393	31,305	32,244	33,212	34,208	35,234
Telephone & Fax Charges - Office	7,295	7,192	7,408	7,630	7,859	8,095	8,337	8,586	8,845	9,111	9,384	9,665	9,955	10,254	10,562	10,879	11,205	11,541	11,887	12,244	12,611	12,990	13,379	13,781	14,194	14,620	15,058	15,510	15,976	16,455
Bank & Merchant Charges	25,200	25,725	26,497	27,292	28,110	28,954	29,822	30,717	31,638	32,588	33,565	34,572	35,609	36,678	37,778	38,911	40,079	41,281	42,519	43,795	45,109	46,462	47,856	49,292	50,771	52,294	53,862	55,478	57,143	58,857
Consultancy Fees Consumer Survey	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Audit Fees	16,427	16,986	17,496	18,020	18,561	19,118	19,691	20,282	20,891	21,517	22,163	22,828	23,513	24,218	24,945	25,693	26,464	27,258	28,075	28,918	29,785	30,679	31,599	32,547	33,523	34,529	35,565	36,632	37,731	38,863
Internal Audit	10,000	15,000	15,460	15,914	16,391	16,888	17,389	17,911	18,448	19,002	19,572	20,159	20,764	21,386	22,028	22,689	23,370	24,071	24,793	25,536	26,303	27,092	27,904	28,742	29,604	30,492	31,407	32,349	33,319	34,319
Legal Expenses	8,000	8,000	8,240	8,487	8,742	9,004	9,274	9,552	9,839	10,134	10,438	10,751	11,074	11,406	11,748	12,101	12,464	12,838	13,223	13,619	14,028	14,449	14,882	15,329	15,789	16,262	16,750	17,253	17,770	18,303
Integrated Planning & Reporting (IP&R)	1,500	2,300	2,575	2,952	3,422	3,914	4,428	4,964	5,522	6,102	6,704	7,330	7,980	8,654	9,353	10,078	10,829	11,606	12,410	13,241	14,099	14,984	15,896	16,836	17,804	18,801	19,828	20,885	21,973	23,092
Insurance - Public Liability/Prof. Indemnity	23,585	24,387	25,119	25,872	26,648	27,448	28,271	29,119	29,993	30,893	31,820	32,774	33,757	34,770	35,813	36,888	37,994	39,134	40,308	41,517	42,763	44,046	45,367	46,728	48,130	49,574	51,061	52,593	54,171	55,796
- Industrial Special Risk (Property)	56,975	61,658	63,208	65,413	67,375	69,397	71,479	73,623	75,832	78,107	80,450	82,863	85,349	87,910	90,547	93,263	96,061	98,943	101,911	104,969	108,118	111,361	114,702	118,143	121,687	125,338	129,088	132,971	136,960	141,069
- Fidelity Guarantee	1,000	1,030	1,061	1,093	1,126	1,159	1,194	1,230	1,267	1,305	1,344	1,384	1,426	1,469	1,513	1,558	1,605	1,653	1,702	1,754	1,806	1,860	1,916	1,974	2,033	2,094	2,157	2,221	2,288	2,357
Sundry Administration Expenses:	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Sundry Expenses	9,219	7,700	7,931	8,169	8,414	8,666	8,926	9,194	9,470	9,754	10,047	10,348	10,659	10,978	11,308	11,647	11,996	12,356	12,727	13,109	13,502	13,907	14,324	14,754	15,197	15,653	16,122	16,606	17,104	17,617
- Rounding of Cents	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Collection Agency Charges	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Commission on Water Sales	1,284	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Blayney Shire - Shared HR Support	4,000	4,000	4,120	4,244	4,371	4,502	4,637	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WBC Alliance	19,143	22,883	23,869	24,277	25,005	25,755	26,528	27,323	28,143	28,987	29,857	30,753	31,675	32,626	33,604	34,613	35,651	36,720	37,822	38,957	40,125	41,329	42,569	43,846	45,162	46,516	47,912	49,349	50,830	52,355
WBC Alliance Projects	30,000	50,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Contributions & Donations	12,860	12,910	13,297	13,696	14,107	14,530	14,966	15,415	15,878	16,354	16,845	17,350	17,870	18,407	18,959	19,528	20,113	20,717	21,338	21,978	22,638	23,317	24,016	24,737	25,479	26,243	27,031	27,842	28,677	29,537
Chairman's Allowance	14,420	14,781	15,224	15,681	16,151	16,636	17,135	17,649	18,178	18,723	19,285	19,864	20,460	21,073	21,706	22,357	23,028	23,718	24,430	25,163	25,918	26,695	27,496	28,321	29,171	30,046	30,947	31,875	32,832	33,817
Chairman's Allowance	14,420	14,781	15,224	15,681	16,151	16,636	17,135	17,649	18,178	18,723	19,285	19,864	20,460	21,073	21,706	22,357	23,028	23,718	24,430	25,163	25,918	26,695	27,496	2						

CENTRAL TABLELANDS Water - 30 Year Financial Plan

OPERATING STATEMENT	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34	34/35	35/36	36/37	37/38	38/39	39/40	40/41	41/42	42/43	
Members' Travelling & Subsistence	4,400	4,400	4,532	4,668	4,808	4,952	5,101	5,254	5,411	5,574	5,741	5,913	6,091	6,273	6,462	6,655	6,855	7,061	7,273	7,491	7,715	7,947	8,185	8,431	8,684	8,944	9,213	9,489	9,774	10,067	
Travelling & Subsistence	4,400	4,400	4,532	4,668	4,808	4,952	5,101	5,254	5,411	5,574	5,741	5,913	6,091	6,273	6,462	6,655	6,855	7,061	7,273	7,491	7,715	7,947	8,185	8,431	8,684	8,944	9,213	9,489	9,774	10,067	
Members' Sundry Expenses	2,628	2,628	2,706	2,788	2,871	2,957	3,046	3,136	3,136	3,230	3,327	3,427	3,530	3,636	3,745	3,857	3,973	4,092	4,215	4,341	4,472	4,606	4,744	4,886	5,033	5,184	5,339	5,500	5,665	5,835	
Insurance	2,628	2,628	2,706	2,788	2,871	2,957	3,046	3,136	3,136	3,230	3,327	3,427	3,530	3,636	3,745	3,857	3,973	4,092	4,215	4,341	4,472	4,606	4,744	4,886	5,033	5,184	5,339	5,500	5,665	5,835	
Delegates Expenses	9,236	9,236	9,406	9,582	9,763	9,949	10,140	10,336	10,534	10,734	10,937	11,143	11,352	11,564	11,779	11,998	12,221	12,448	12,679	12,914	13,153	13,396	13,643	13,894	14,149	14,408	14,671	14,938	15,209	15,484	15,762
LG One Association & LGMA Conferences	6,438	6,438	6,624	6,816	7,014	7,218	7,428	7,641	7,858	8,079	8,304	8,533	8,766	9,003	9,244	9,490	9,741	9,997	10,258	10,524	10,795	11,071	11,352	11,638	11,929	12,225	12,526	12,832	13,143	13,459	13,780
Water Resources Conference	2,798	2,798	2,871	2,946	3,022	3,099	3,177	3,256	3,336	3,417	3,500	3,584	3,669	3,755	3,842	3,930	4,019	4,109	4,200	4,292	4,385	4,479	4,574	4,670	4,767	4,865	4,964	5,064	5,165	5,266	5,368
Subscriptions	23,674	23,674	24,406	25,136	25,866	26,596	27,326	28,056	28,786	29,516	30,246	30,976	31,706	32,436	33,166	33,896	34,626	35,356	36,086	36,816	37,546	38,276	39,006	39,736	40,466	41,196	41,926	42,656	43,386	44,116	44,846
LGNWS Subscription	2,358	2,475	2,549	2,626	2,704	2,786	2,869	2,955	3,044	3,135	3,229	3,326	3,426	3,529	3,635	3,744	3,856	3,972	4,091	4,214	4,340	4,470	4,604	4,742	4,885	5,031	5,182	5,338	5,498	5,663	5,833
Water Directorate	3,416	3,455	3,559	3,665	3,775	3,889	4,005	4,125	4,249	4,377	4,508	4,643	4,783	4,926	5,074	5,226	5,383	5,544	5,711	5,882	6,058	6,240	6,427	6,620	6,819	7,023	7,234	7,451	7,675	7,905	
Australian Water Association	618	655	675	695	716	737	759	782	806	830	855	880	907	934	962	991	1,020	1,051	1,083	1,115	1,149	1,183	1,218	1,255	1,293	1,331	1,371	1,413	1,455	1,499	
CENTROC	6,000	5,645	5,814	5,989	6,168	6,353	6,544	6,740	6,942	7,150	7,364	7,584	7,809	8,039	8,274	8,514	8,759	9,009	9,264	9,524	9,789	10,059	10,334	10,614	10,899	11,189	11,484	11,784	12,089	12,399	
CENTROC Water Utilities Alliance	8,197	8,740	8,485	9,036	9,307	9,586	9,874	10,170	10,475	10,789	11,113	11,447	11,790	12,144	12,508	12,883	13,270	13,668	14,078	14,500	14,935	15,383	15,845	16,320	16,810	17,314	17,833	18,368	18,919	19,487	
CENTROC Sawewater Alliance Membership	2,595	2,256	2,324	2,393	2,465	2,539	2,615	2,694	2,775	2,858	2,944	3,032	3,123	3,217	3,313	3,412	3,515	3,620	3,729	3,841	3,956	4,075	4,197	4,323	4,452	4,586	4,724	4,865	5,011	5,162	
Lachlan Valley Water Inc	490	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Technical/Supervision Salaries	105,969	109,119	112,393	115,764	119,237	122,814	126,499	130,294	134,203	138,229	142,376	146,647	151,046	155,578	160,245	165,052	170,004	175,104	180,357	185,768	191,341	197,081	202,994	209,083	215,356	221,817	228,471	235,325	242,385	249,656	
Operations Manager	105,969	109,119	112,393	115,764	119,237	122,814	126,499	130,294	134,203	138,229	142,376	146,647	151,046	155,578	160,245	165,052	170,004	175,104	180,357	185,768	191,341	197,081	202,994	209,083	215,356	221,817	228,471	235,325	242,385	249,656	
Technical Assistance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Technical/Super. Staff Leave Entitlements	22,977	23,108	23,801	24,670	25,743	27,007	28,469	30,127	31,984	34,041	36,308	38,785	41,474	44,386	47,524	50,899	54,522	58,404	62,546	66,959	71,644	76,601	81,841	87,374	93,211	99,356	105,811	112,586	119,691	127,126	134,901
Annual Leave	8,831	9,093	9,366	9,647	9,936	10,235	10,542	10,858	11,184	11,519	11,865	12,221	12,587	12,965	13,354	13,754	14,167	14,592	15,030	15,481	15,945	16,423	16,916	17,424	17,946	18,485	19,039	19,610	20,199	20,805	
Long Service Leave	14,146	14,015	14,435	14,823	15,287	15,826	16,441	17,134	17,907	18,760	19,694	20,709	21,816	22,916	24,111	25,404	26,797	28,291	29,887	31,587	33,392	35,304	37,324	39,454	41,696	44,051	46,519	49,102	51,799	54,610	57,535
Technical/Supervision Staff Overheads	9,788	9,244	9,521	9,986	10,466	10,961	11,471	12,006	12,566	13,151	13,761	14,396	15,056	15,741	16,461	17,216	18,006	18,831	19,691	20,586	21,516	22,481	23,491	24,546	25,646	26,791	27,981	29,216	30,506	31,841	33,221
Payroll Tax	4,107	3,742	3,855	3,970	4,090	4,212	4,339	4,469	4,603	4,741	4,883	5,030	5,180	5,336	5,496	5,661	5,831	6,006	6,186	6,371	6,562	6,759	6,962	7,171	7,386	7,608	7,836	8,071	8,313	8,563	
Fringe Benefits Tax	2,000	4,000	4,120	4,244	4,371	4,502	4,637	4,776	4,919	5,067	5,219	5,376	5,537	5,703	5,874	6,050	6,232	6,419	6,611	6,810	7,014	7,224	7,441	7,664	7,894	8,131	8,375	8,626	8,885	9,152	
Training Expenses	1,240	1,200	1,236	1,273	1,311	1,351	1,391	1,433	1,476	1,520	1,566	1,613	1,661	1,711	1,762	1,815	1,870	1,926	1,983	2,043	2,104	2,167	2,232	2,299	2,368	2,439	2,513	2,588	2,666	2,746	
Workers Compensation Insurance	3,533	3,675	3,785	3,898	4,015	4,136	4,260	4,388	4,519	4,655	4,794	4,938	5,086	5,239	5,396	5,558	5,725	5,897	6,073	6,256	6,443	6,637	6,836	7,041	7,252	7,470	7,694	7,924	8,162	8,407	
Superannuation	23,067	23,370	24,071	24,971	26,071	27,371	28,871	30,571	32,471	34,571	36,871	39,371	42,071	44,971	48,171	51,671	55,471	59,571	63,971	68,771	73,871	79,271	84,971	90,971	97,271	103,871	110,771	117,971	125,471	133,271	141,371
Sick Leave Insurance	3,461	3,044	3,135	3,229	3,326	3,426	3,529	3,635	3,744	3,856	3,972	4,091	4,214	4,340	4,470	4,604	4,742	4,885	5,031	5,182	5,338	5,498	5,663	5,833	6,008	6,188	6,373	6,565	6,762	6,964	
less Supervision O/heads charged to jobs	(27,620)	(29,787)	(30,681)	(31,601)	(32,549)	(33,526)	(34,531)	(35,567)	(36,634)	(37,733)	(38,865)	(40,031)	(41,232)	(42,469)	(43,743)	(45,055)	(46,407)	(47,799)	(49,233)	(50,710)	(52,232)	(53,799)	(55,413)	(57,075)	(58,787)	(60,551)	(62,367)	(64,238)	(66,166)	(68,150)	
Technical/Supervision Travelling	19,800	18,000	18,540	19,096	19,669	20,259	20,867	21,493	22,138	22,802	23,486	24,190	24,916	25,664	26,434	27,227	28,043	28,885	29,751	30,644	31,563	32,510	33,485	34,490	35,525	36,590	37,688	38,819	39,983	41,183	
Operations Manager	19,800	18,000	18,540	19,096	19,669	20,259	20,867	21,493	22,138	22,802	23,486	24,190	24,916	25,664	26,434	27,227	28,043	28,885	29,751	30,644	31,563	32,510	33,485	34,490	35,525	36,590	37,688	38,819	39,983	41,183	

CENTRAL TABLELANDS *Water* - 30 Year Financial Plan

OPERATING STATEMENT	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34	34/35	35/36	36/37	37/38	38/39	39/40	40/41	41/42	42/43	
Utility Engineering Expenses	55,000	58,724	60,886	62,320	64,238	61,657	63,301	65,200	67,156	86,662	71,246	73,383	75,505	77,852	80,188	82,594	85,071	87,624	90,252	92,960	95,749	98,621	101,580	104,627	107,766	110,999	114,329	117,759	121,292	124,930	
Engineers Office/Mapping Expenses	3,082	3,030	3,121	3,215	3,311	3,410	3,513	3,618	3,727	3,888	3,953	4,072	4,194	4,320	4,450	4,583	4,721	4,862	5,008	5,158	5,313	5,473	5,637	5,806	5,980	6,159	6,344	6,534	6,731	6,932	
Telmetry Expenses	45,618	44,194	45,520	46,886	48,292	49,741	51,238	52,770	54,339	55,964	57,663	59,393	61,175	63,010	64,901	66,846	68,853	70,919	73,046	75,237	77,495	79,819	82,214	84,680	87,221	89,838	92,533	95,309	98,168	101,113	
Asset/Mapping Management System	1,500	7,000	7,210	7,436	7,649	7,839	8,115	8,338	8,609	8,867	9,133	9,407	9,690	9,980	10,280	10,588	10,906	11,233	11,570	11,917	12,275	12,643	13,022	13,413	13,815	14,230	14,656	15,096	15,549	16,015	
Asset Revaluation	4,800	4,500	4,635	4,774	4,915	4,611	4,544	4,644	4,67	4,671	4,86	4,96	5,11	5,26	5,42	5,58	5,75	6,10	6,24	6,47	6,66	6,86	7,07	7,28	7,50	7,73	7,96	8,20	8,44	8,69	
Waterworks/Demand Management	132,662	131,906	135,863	139,938	216,827	130,780	134,704	138,745	142,907	147,194	151,610	156,159	160,848	165,669	170,639	175,758	181,031	186,461	192,055	197,817	203,751	209,864	216,160	222,645	229,324	236,204	243,290	250,589	258,106	265,849	
Operational Staff Leave Entitlements	57,902	58,223	60,972	61,874	63,731	65,643	67,612	69,640	71,729	73,881	76,098	78,381	80,732	83,154	85,649	88,218	90,855	93,561	96,338	99,200	102,149	105,187	108,297	111,472	114,716	118,033	121,425	124,897	129,551	133,338	
Annual Leave	46,718	45,287	46,646	48,045	12,176	31,290	34,289	35,317	36,377	37,468	38,592	39,750	40,943	42,171	43,436	44,739	46,081	47,464	48,887	50,354	51,865	53,421	55,023	56,674	58,374	60,125	61,929	63,787	65,701	67,672	
Public Holidays	23,042	33,296	33,145	30,020	30,920	31,848	32,808	33,787	34,801	35,845	36,920	38,028	39,169	40,344	41,554	42,801	44,085	45,407	46,769	48,173	49,618	51,106	52,639	54,219	55,845	57,511	59,326	61,184	63,084	65,024	67,004
Operational Staff Overheads	68,758	80,528	82,844	105,628	108,737	112,051	115,442	118,885	122,452	126,125	129,909	133,806	137,820	141,955	146,214	150,600	155,118	159,772	164,566	169,500	174,582	179,824	185,219	190,776	196,499	202,394	208,466	214,720	221,161	227,796	
Payroll Tax	25,297	23,247	24,048	24,769	25,512	26,277	27,066	27,878	28,714	29,575	30,463	31,377	32,318	33,287	34,286	35,315	36,374	37,465	38,589	39,747	40,939	42,167	43,432	44,735	46,078	47,460	48,884	50,350	51,861	53,416	
Fringe Benefits Tax	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Training Expenses	19,335	19,499	20,084	20,667	21,307	21,947	22,605	23,283	23,982	24,701	25,442	26,205	26,992	27,801	28,635	29,494	30,379	31,291	32,229	33,196	34,192	35,218	36,274	37,363	38,484	39,638	40,827	42,052	43,314	44,613	
Workers Compensation Insurance	20,810	20,974	21,500	22,145	22,810	23,494	24,199	24,925	25,673	26,443	27,236	28,053	28,895	29,762	30,654	31,574	32,521	33,497	34,502	35,537	36,603	37,701	38,832	39,997	41,197	42,433	43,706	45,017	46,368	47,759	
Superannuation	79,687	75,143	77,387	93,224	61,310	63,149	65,093	66,995	68,905	71,075	73,207	75,403	77,665	79,995	82,395	84,867	87,413	90,035	92,736	95,519	98,384	101,336	104,376	107,507	110,732	114,054	117,476	121,000	124,630	128,369	
Sick Leave Insurance	5,069	4,390	4,521	4,657	4,797	4,941	5,089	5,242	5,399	5,561	5,728	5,899	6,076	6,259	6,446	6,640	6,839	7,044	7,256	7,473	7,697	7,928	8,166	8,411	8,664	8,923	9,191	9,467	9,751	10,043	
Asset Revaluation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Bus: Queensland Overheads & Supervision	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Bus: Contributions to Overheads	(213,296)	(220,762)	(230,945)	(237,430)	(245,532)	(253,488)	(259,490)	(267,207)	(275,223)	(283,480)	(291,984)	(300,744)	(309,766)	(319,059)	(328,631)	(338,490)	(348,646)	(359,104)	(369,877)	(380,973)	(392,403)	(404,175)	(416,300)	(428,789)	(441,653)	(454,902)	(468,549)	(482,506)	(497,861)	(513,696)	
Water Reading	75,356	74,205	76,431	78,724	81,085	83,518	86,023	88,604	91,262	94,000	96,820	99,725	102,716	105,798	108,972	112,241	115,608	119,077	122,649	126,328	130,118	134,022	138,042	142,184	146,449	150,843	155,368	160,029	164,830	169,775	
Meter Reading	75,356	74,205	76,431	78,724	81,085	83,518	86,023	88,604	91,262	94,000	96,820	99,725	102,716	105,798	108,972	112,241	115,608	119,077	122,649	126,328	130,118	134,022	138,042	142,184	146,449	150,843	155,368	160,029	164,830	169,775	
Depot Expenses	68,808	71,909	74,066	76,288	78,577	80,934	83,362	85,863	88,439	91,092	93,824	96,639	99,538	102,525	105,600	108,768	112,031	115,392	118,854	122,420	126,092	133,771	137,784	141,938	146,316	150,961	155,978	161,390	167,222	173,482	
Depot Expenses	68,808	71,909	74,066	76,288	78,577	80,934	83,362	85,863	88,439	91,092	93,824	96,639	99,538	102,525	105,600	108,768	112,031	115,392	118,854	122,420	126,092	133,771	137,784	141,938	146,316	150,961	155,978	161,390	167,222	173,482	
Work Health & Safety (WHS)	5,346	17,598	5,671	5,841	6,016	6,197	6,383	6,574	6,771	6,974	7,184	7,399	7,621	7,850	8,085	8,328	8,578	8,835	9,100	9,373	9,654	9,944	10,242	10,549	10,866	11,192	11,528	11,873	12,229	12,597	
Work Health & Safety (WHS)	5,346	17,598	5,671	5,841	6,016	6,197	6,383	6,574	6,771	6,974	7,184	7,399	7,621	7,850	8,085	8,328	8,578	8,835	9,100	9,373	9,654	9,944	10,242	10,549	10,866	11,192	11,528	11,873	12,229	12,597	
Dams & Weirs	96,139	109,982	112,497	115,872	119,348	122,929	126,617	130,415	134,328	138,358	142,508	146,783	151,187	155,723	160,394	165,206	170,162	175,267	180,521	185,941	191,519	197,265	203,183	209,278	215,557	222,023	228,684	235,544	242,611	249,889	
Lake Rowlands - Foreshore Management	13,083	12,510	12,885	13,372	13,870	14,380	14,902	15,437	15,985	16,547	17,124	17,716	18,323	18,946	19,585	20,240	20,912	21,602	22,310	23,037	23,784	24,551	25,339	26,148	26,979	27,832	28,704	29,596	30,508	31,441	
- Algal Control	3,844	3,589	3,697	3,807	3,922	4,039	4,161	4,285	4,414	4,546	4,683	4,823	4,968	5,117	5,270	5,429	5,591	5,759	5,932	6,110	6,293	6,482	6,676	6,877	7,083	7,296	7,514	7,740	7,972	8,211	
- Control Rates	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
- Maintenance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
- Check Levels & Destrat'n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
- Other	18,019	39,779	40,973	42,202	43,468	44,772	46,115	47,499	48,924	50,391	51,903	53,460	55,064	56,716	58,417	60,170	61,975	63,834	65,749	67,722	69,754	71,846	74,002	76,222	78,508	80,863	83,289	85,788	88,362	91,013	
Lake Rowlands - Safety Review	5,421	761	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Bogong Dam - Foreshore Management	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
- Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Dams Maintenance	450,984	472,884	486,367	501,576	518,624	537,122	546,086	564,528	581,444	598,908	616,876	635,382	654,448	674,077	694,299	715,128	736,582	758,679	781,409	804,883	829										

CENTRAL TABLELANDS Water - 30 Year Financial Plan

OPERATING STATEMENT	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34	34/35	35/36	36/37	37/38	38/39	39/40	40/41	41/42	42/43	
Water Filtration - Operating Expenses	157,363	183,093	188,586	194,243	200,071	206,073	279,451	287,834	294,393	303,225	312,322	321,691	331,342	341,282	351,521	362,066	372,928	384,116	395,640	407,509	419,734	432,326	445,296	458,655	472,414	486,587	501,185	516,220	531,707	547,658	
Blayney WFP	53,831	57,114	58,828	60,593	62,410	64,283	66,211	68,198	70,244	72,351	74,521	76,757	79,060	81,432	83,874	86,391	88,982	91,652	94,401	97,233	100,150	103,155	106,250	109,437	112,720	116,102	119,585	123,172	126,868	130,674	
Carcoar WFP	53,831	57,114	58,828	60,593	62,410	64,283	66,211	68,198	70,244	72,351	74,521	76,757	79,060	81,432	83,874	86,391	88,982	91,652	94,401	97,233	100,150	103,155	106,250	109,437	112,720	116,102	119,585	123,172	126,868	130,674	
Grenfell WFP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Off-site Sludge Disposal	-	-	-	-	-	-	67,196	69,212	71,288	73,427	75,630	77,899	80,236	82,643	85,122	87,676	90,306	93,015	95,805	98,680	101,640	104,689	107,830	111,065	114,397	117,829	121,363	125,004	128,754		
Staff Training	5,079	6,194	6,380	6,572	6,769	6,972	7,181	7,396	7,618	7,847	8,082	8,325	8,575	8,832	9,097	9,370	9,651	9,940	10,238	10,546	10,862	11,188	11,523	11,869	12,225	12,592	12,970	13,359	13,760	14,172	
Water Analysis - Reticulation	16,922	21,090	21,722	22,374	23,045	23,737	24,449	25,182	25,938	26,716	27,517	28,343	29,193	30,069	30,971	31,900	32,857	33,843	34,858	35,904	36,981	38,090	39,233	40,410	41,622	42,871	44,157	45,482	46,846	48,252	
- Trunk Mains	16,723	16,152	16,637	17,136	17,650	18,180	18,725	19,287	19,865	20,461	21,075	21,708	22,359	23,030	23,720	24,432	25,165	25,920	26,698	27,498	28,323	29,173	30,048	30,950	31,878	32,835	33,820	34,834	35,879	36,956	
- Lake Rowlands	9,306	8,903	9,170	9,445	9,728	10,020	10,321	10,631	10,949	11,278	11,616	11,965	12,324	12,693	13,074	13,466	13,870	14,287	14,715	15,157	15,611	16,080	16,562	17,059	17,571	18,098	18,641	19,200	19,776	20,369	
- Other	1,671	16,525	17,020	17,531	18,057	18,599	19,156	19,731	20,323	20,933	21,561	22,208	22,874	23,560	24,267	24,995	25,745	26,517	27,313	28,132	28,976	29,845	30,741	31,663	32,613	33,591	34,599	35,637	36,706	37,807	
Water Filtration - Maintenance & Repair	284,829	261,832	269,686	277,777	286,110	294,694	303,535	312,641	322,020	331,680	341,631	351,880	362,436	373,309	384,508	396,044	407,925	420,163	432,768	445,751	459,123	472,897	487,084	501,696	516,747	532,250	548,217	564,664	581,604	599,052	
Blayney WFP	113,162	111,066	114,397	117,829	121,364	125,005	128,755	132,618	136,597	140,694	144,915	149,263	153,741	158,353	163,103	167,997	173,036	178,228	183,574	189,082	194,754	200,597	206,615	212,813	219,197	225,773	232,547	239,523	246,709	254,110	
Carcoar WFP	171,667	150,766	155,289	159,948	164,746	169,689	174,779	180,023	185,423	190,986	196,715	202,617	208,695	214,956	221,405	228,047	234,889	241,935	249,193	256,669	264,369	272,300	280,469	288,883	297,550	306,476	315,671	325,141	334,895	344,942	
Grenfell WFP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Water Filtration - Chemical Costs	207,851	169,533	174,619	179,857	185,253	190,811	196,535	202,431	208,504	214,759	221,202	227,838	234,673	241,713	248,965	256,434	264,127	272,051	280,212	288,618	297,277	306,195	315,381	324,843	334,588	344,625	354,964	365,613	376,582	387,879	
Blayney WFP	68,088	48,760	50,223	51,729	53,281	54,880	56,526	58,222	59,969	61,768	63,621	65,529	67,495	69,520	71,606	73,754	75,966	78,245	80,593	83,011	85,501	88,066	90,708	93,429	96,232	99,119	102,093	105,155	108,310	111,559	
Carcoar WFP	135,983	116,993	120,503	124,118	127,841	131,677	135,627	139,696	143,887	148,203	152,649	157,229	161,946	166,804	171,808	176,962	182,271	187,739	193,371	199,173	205,148	211,302	217,641	224,171	230,896	237,822	244,957	252,306	259,875	267,671	
Grenfell WFP	3,780	3,780	3,893	4,010	4,131	4,254	4,382	4,514	4,649	4,788	4,932	5,080	5,232	5,389	5,551	5,718	5,889	6,066	6,248	6,435	6,628	6,827	7,032	7,243	7,460	7,684	7,914	8,152	8,396	8,648	
Water Filtration - Energy Costs	125,459	127,472	131,296	135,235	139,292	143,471	147,775	152,209	156,775	161,478	166,322	171,312	176,452	181,745	187,197	192,813	198,598	204,556	210,692	217,013	223,523	230,229	237,136	244,250	251,578	259,125	266,899	274,906	283,153	291,647	
Blayney WFP	18,891	20,161	20,765	21,388	22,030	22,691	23,372	24,073	24,795	25,539	26,305	27,094	27,907	28,744	29,606	30,495	31,409	32,352	33,322	34,322	35,352	36,412	37,505	38,630	39,789	40,982	42,212	43,478	44,782	46,126	
Carcoar WFP	104,927	105,095	108,248	111,495	114,840	118,285	121,834	125,489	129,254	133,131	137,125	141,239	145,476	149,840	154,336	158,966	163,735	168,647	173,706	178,917	184,285	189,813	195,508	201,373	207,414	213,637	220,046	226,647	233,446	240,450	
Grenfell WFP	1,641	2,217	2,283	2,352	2,422	2,495	2,570	2,647	2,726	2,808	2,892	2,979	3,069	3,161	3,255	3,353	3,454	3,557	3,664	3,774	3,887	4,004	4,124	4,248	4,375	4,506	4,641	4,781	4,924	5,072	
Other Costs	287,062	297,472	254,897	281,043	295,068	278,532	305,436	295,495	325,760	342,017	322,895	354,084	342,560	377,644	396,190	374,324	410,481	397,120	437,793	459,641	433,944	475,860	460,371	507,253	532,850	503,060	551,652	533,697	588,358	617,719	
Safety Equipment & Clothing	6,978	7,187	7,403	7,625	7,853	8,089	8,332	8,582	8,839	9,104	9,377	9,659	9,948	10,247	10,554	10,871	11,197	11,533	11,879	12,235	12,602	12,981	13,370	13,771	14,184	14,610	15,048	15,499	15,964	16,443	
Installations & Private Works	54,126	36,532	37,628	38,757	39,920	41,117	42,351	43,622	44,930	46,278	47,666	49,096	50,569	52,086	53,649	55,258	56,916	58,624	60,382	62,194	64,060	65,981	67,961	70,000	72,100	74,263	76,491	78,785	81,149	83,583	
Plant Running Expenses	204,958	203,753	209,866	216,162	222,646	229,326	236,206	243,292	250,590	258,108	265,851	273,827	282,042	290,503	299,218	308,195	317,441	326,964	336,773	346,876	357,282	368,001	379,041	390,412	402,124	414,188	426,614	439,412	452,594	466,172	
IWCM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Demand Management Plan	-	-	-	18,500	-	-	-	-	21,400	-	-	-	-	-	24,808	-	-	-	28,759	-	-	-	-	-	-	-	-	-	-	-	-
Drought Management Plan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drinking Water Management Plan	5,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lake Rowlands Dam Surveillance Review	16,000	-	-	-	-	-	18,548	-	-	21,502	-	-	-	-	-	-	24,927	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Consultancy - Asset Management Plan	-	25,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Consultancy - Quality Assurance Plan	-	25,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Update Developer Servicing Plan	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Quandialla Water Supply	31,627	33,960	34,979	36,028	37,109	38,222	39,369	40,550	41,766	43,019	44,310	45,639	47,008	48,419	49,871	51,367	52,908	54,496	56,130	57,814	59,549	61,335	63,175	65,071	67,023	69,033	71,104	73,237	75,435	77,698	
Electricity	7,291	9,392	9,674	9,964	10,263	10,571	10,888	11,214	11,551	11,897	12,254	12,622	13,001	13,391	13,792																

CENTRAL TABLELANDS Water - 30 Year Financial Plan

NON OPERATING EXPENSES	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34	34/35	35/36	36/37	37/38	38/39	39/40	40/41	41/42	42/43							
Acquisition of Assets	701,811	2,132,046	746,761	3,603,873	3,867,514	1,139,089	2,946,108	4,263,849	4,040,826	5,995,397	8,039,541	4,164,420	4,289,352	1,469,520	8,123,908	8,112,073	4,001,217	1,809,431	1,965,359	1,919,625	1,997,214	2,377,018	16,237,022	2,160,555	2,343,207	2,292,133	2,360,897	2,431,724	2,504,675	1,269,958							
Funding																																					
Vehicle Replacements	416,000	407,000	419,210	431,786	444,740	458,082	471,825	485,979	500,559	515,575	531,043	546,974	563,383	580,285	597,693	615,624	634,093	653,116	672,709	692,890	713,677	735,087	757,140	779,854	803,250	827,347	852,168	877,733	904,065	931,187							
Office Furniture & Equipment								1,350																													
Meter Replacement Programme	131,266	102,189	105,255	108,412	111,665	115,015	118,465	122,019	125,680	129,450	133,333	137,333	141,454	145,697	150,068	154,570	159,207	163,983	168,903	173,970	179,189	184,565	190,102	195,805	201,679	207,729	213,961	220,380	226,991	233,801							
Provision for Pump Replacements	44,545	45,880	47,256	48,674	50,134	51,638	53,187	54,783	56,427	58,119	59,863	61,659	63,509	65,414	67,376	69,398	71,480	73,624	75,833	78,108	80,451	82,864	85,330	87,911	90,548	93,265	96,063	98,944	101,913	104,970							
Telemetry					261,000																																
Reticalation Mains Renewals																																					
- As determined					245,975	253,354	260,955	268,784	276,847	285,152	293,707	302,518	311,594	320,942	330,580	340,498	350,687	361,147	371,869	382,855	394,107	405,626	417,412	429,475	441,824	454,469	467,411	480,661	494,228	508,122	522,356	536,948					
- Millthorpe																																					
- South Canowindra																																					
- Cudal AC Pipe																																					
- Carcoar																																					
Reticalation Mains Extensions																																					
CWFP & BWFP - Mech & Elec refurb																																					
CWFP - Mech & Elec refurb							1,384,234																														
CWFP - Low Level Storage	445,000																																				
CWFP - Repair Plenum Floor	200,000																																				
Blayney WFP - Upgrade	700,000																																				
Blayney Water Filtration Plant																																					
Trunk Main Renewals																																					
Trunk Main 'K' Renewal		173,890	3,015,000	3,015,000																																	
Trunk Main 'U' - 'C' to Cudal						130,810	1,946,700	1,946,700																													
Trunk Main 'C' - Mand to 'U'							280,000	4,780,000	4,780,000																												
Trunk Main 'B' - CWFP to Mand.								71,300	1,395,000																												
Trunk Main 'C' - 'U' to G'ong																																					
Trunk Main'D' - CWFP to B/Ck																																					
Trunk Main 'A' - L/R to CWFP																																					
Trunk Main 'F' B/Ck to M'Thorp																																					
Trunk Main 'P' - 'C' to Somers																																					
Trunk Main 'X' - L/R to Blayney																																					
Flood Restoration																																					
Gooloogong Bridge Trunk Main relocation	60,000	204,977																																			
Lake Rowlands Remediation							1,910,866																														
Service Reservoirs																																					
Administration Building																																					
Admin Building Refurbishment (Indoor)	25,000	22,000										15,000																									
Admin Building Refurbishment (Outdoor)	15,000	5,000									604,707																										
Admin Building Replacement																																					
IT Link Upgrade (BSC & CTW)	10,000																																				
Gooloogong Bore																																					
New Bore Gooloogong																																					
Refurbish Gooloogong Bore																																					
Caragabal Investigation																																					
Repayment of Loans	336,292	359,004	382,708	409,096	436,725	466,219	497,487	531,304	413,245		214,679	232,197	251,145	271,638	293,804	317,778	343,709	371,755	402,090	434,001	470,389	508,773	550,289	595,192	643,760	696,291	753,108	814,562	881,030	952,912							
Principal on Loans - Quantidilla	24,077	25,703	27,400	29,289	31,267	33,379	35,618	38,039	29,586																												
- Capital Works																																					
Transfers to Reserves	982,681	918,394	964,103	1,011,670	1,060,973	1,112,091	1,165,109	1,220,115	1,172,266	1,222,357	1,273,937	1,327,052	1,381,748	1,438,071	1,496,072	1,555,799	1,617,306	1,680,643	1,745,867	1,813,034	1,882,203	1,953,433	2,026,785	2,102,324	2,180,115	2,260,224	2,336,550	2,394,851	2,465,186	2,537,616							
Renewals Reserve	536,916	565,316	599,066	633,210	668,379	704,603	741,914	780,343	819,926	860,697	902,690	945,943	990,494	1,036,381	1,083,645	1,132,327	1,182,470	1,234,116	1,287,312	1,342,004	1,398,540	1,456,669	1,516,541	1,578,210	1,641,729	1,707,153	1,783,368	1,811,119	1,865,452	1,921,416							
Renewals Reserve - Dev Charges	158,4																																				

