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Final Report

Asset Management Plan – Mareeba Distribution – Service Contract MIM Financial Years 2019 to 2024



Photo of Tinaroo Dam

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List of Abbreviations used in this report:

Abbreviation	Extension
AMP	Asset Management Plan
AS INS	Asset and Strategy Inspection
MBM	Mareeba Supply Service Contract
MIM	Mareeba Distribution Service Contract
NR CIV	Non-Routine Civil
NR ELE	Non-Routing Electrical
NR MEC	Non-Routine Mechanical
NR MET	Non-Routine Metering
NR SCA	Non-routine Supervisory Control and Data Acquisitions (SCADA) Communications
NSP	Network Service Plan
PS	Pump Station
QCA	Queensland Competition Authority
RE ICR	Renewals - Improve Condition and Reduce Risk
ROL	Resource Operating Licence
ROP	Resource Operating Plan
SAMP	Strategic Asset Management Plan
WHS	Workplace Health and Safety
WMS	Works Management System

Executive Summary

This Asset Management Plan (AMP) provides a link between the assets, the current and future service levels, expenditure drivers and the forecast expenditure. It clearly establishes the relationship between corporate goals and asset management outputs.

Mareeba Distribution has assets with an estimated replacement cost of **\$419.2M** with a weighted average asset age of **53 years**.

SunWater's aim is to manage its assets in a sustainable manner to meet SunWater's business objectives of safeguarding asset integrity and ensuring continuing asset serviceability. SunWater has developed a business model for determining the set of assets due for renewal over the forecast period. This model is risk based. Assets are assessed for condition and risk which is used in combination with anticipated asset lives to determine the type of intervention strategy required and the timeframe involved. Approximately **96 per cent** of Mareeba Distribution assets are considered low or moderate risk.

For a summary of the financial forecasts, refer to the relevant Network Service Plan (which is available on SunWater's web site).

1. Introduction

1.1 Plan Purpose

The primary purpose of this Asset Management Plan (AMP) is to provide a clear line-of-sight from SunWater's customer service targets, through its asset strategies, to related works programs.

SunWater's business is divided into Service Contracts. Each AMP covers the operational assets associated with each SunWater Service Contract.

The Strategic Asset Management Plan (SAMP) establishes the strategic objectives for asset management and provides a framework for the generation of the AMPs.

The AMPs address a six year outlook for the area of coverage and provides a link between the assets, the current and future service levels, expenditure drivers and the forecast expenditure aligned with anticipated revenue. AMPs normally cover a five year period however it has been extended this year due to the upcoming Queensland Competition Authority (QCA) price review which covers the six years ending June 2024.

The preparation and review of such plans will provide SunWater with:

- Clarity regarding the scope of coverage for the plans;
- Consolidated technical and financial information for the assets and the services they provide to customers;
- An understanding of the issues that drive the expenditure proposed such as present and future demands, risk mitigation, asset performance and strategic initiatives;
- A current estimate of the short and long term financial commitment necessary to maintain both the assets and the services they provide;
- A clearly established link between corporate goals and asset management outputs.

1.2 Stakeholders

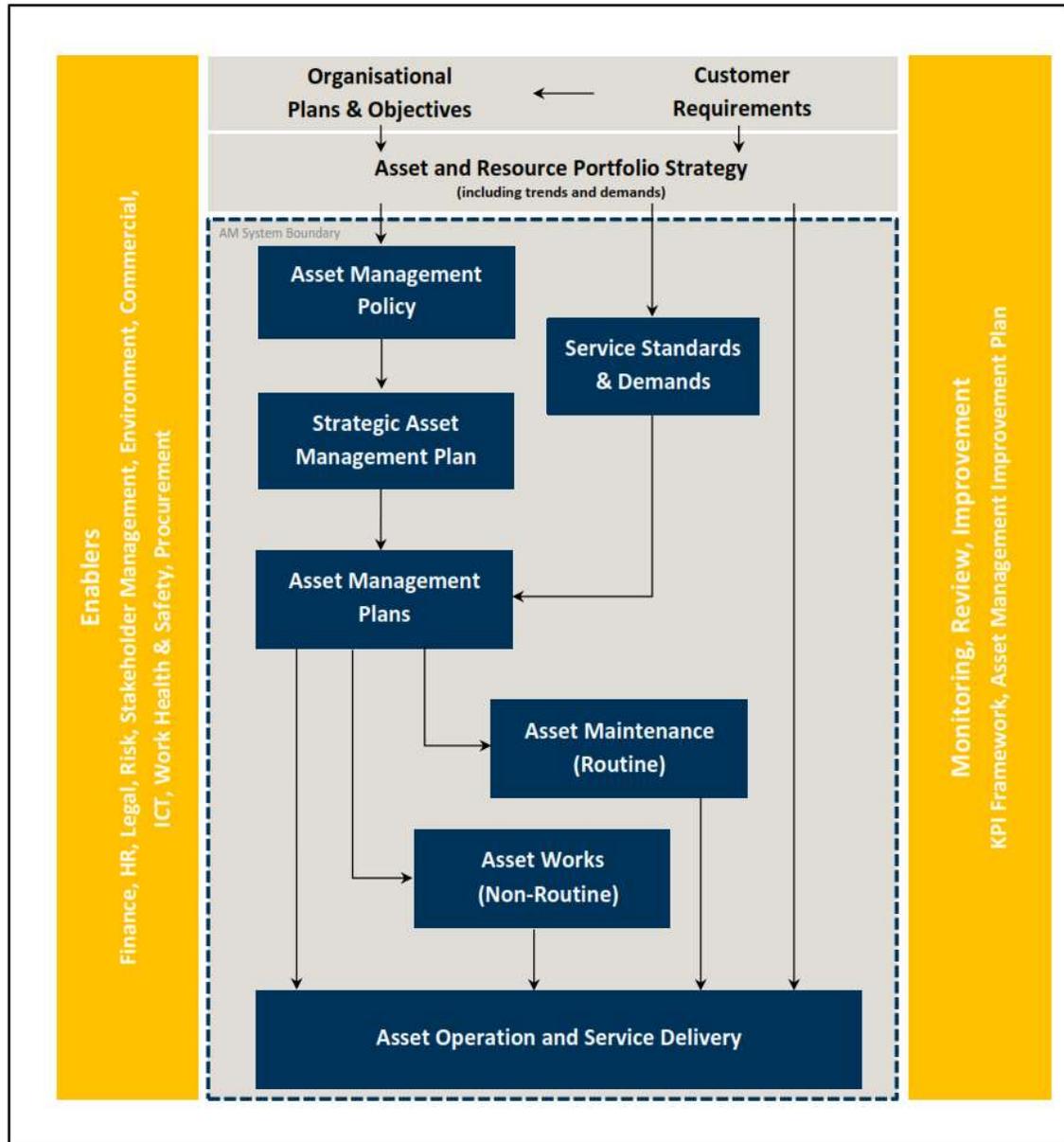
The key stakeholders who have a vested interest in the outputs of this plan are:

- SunWater Management and Board – strategic level information regarding the expenditure proposed over the five-year forecast period to support price path submissions and management decisions.
- SunWater Operations – alignment of expenditure forecast with revenue forecasts, monitoring implementation of agreed five-year price path and strategic direction for the operation, maintenance, renewal and growth of the asset portfolio.
- Customers – Clarity regarding the future direction for the services and assets over the five-year forecast period and how this translates into projects and programs of work.
- Queensland Competition Authority – Price path setting for monopoly based services namely Irrigation. Industrial pipelines are managed under individual customer contract and hence do not attract QCA oversight.

1.3 Context

SunWater’s Asset Management System overview is provided in Figure 1 which shows where the asset management plans fit within the key elements of the asset management system.

Figure 1 Overview of the Asset Management System¹



Asset Management Plans are tactical plans for achieving strategies resulting from the strategic planning process. The SAMP provides a more detailed roadmap as to how business processes relating

¹ SunWater Strategic Asset Management Plan

to asset management planning are undertaken, whilst the AMP focuses on the outcomes of those processes.

Key information feeding into the AMP are:

- SunWater Corporate Plan and Statement of Corporate Intent
- Asset Management Policy
- Strategic Asset Management Plan
- Customer service standards and performance reports
- Asset performance reporting and studies
- Demand Forecasts, Risk Studies, Compliance Requirements and any other drivers for expenditure.
- Customer Feedback

Key information informed by the AMP includes:

- Operations and Maintenance Manuals
- Price path submissions
- Annual budget preparation and works scheduling
- Business Improvement Plans

1.4 Plan Methodology

Details regarding the methodology by which this AMP has been prepared are provided in SunWater's Strategic Asset Management Plan.

The AMP's findings and forecast are based on available information at the time of preparation. Where information and knowledge gaps exist, these have been reflected in the improvement plan section of the AMP to allow an ongoing and continuous improvement to the quality of the plan.

The Asset Management Plan is a living document, reviewed on an annual basis during SunWater's budgeting cycle.

2. Service Contract Summary

2.1 Mareeba Dimbulah Water Supply Scheme

Mareeba Supply operates as part of a larger water supply scheme called the Mareeba Dimbulah Water Supply Scheme. This scheme incorporates the following key service contracts:

- Mareeba Supply
- Mareeba Distribution

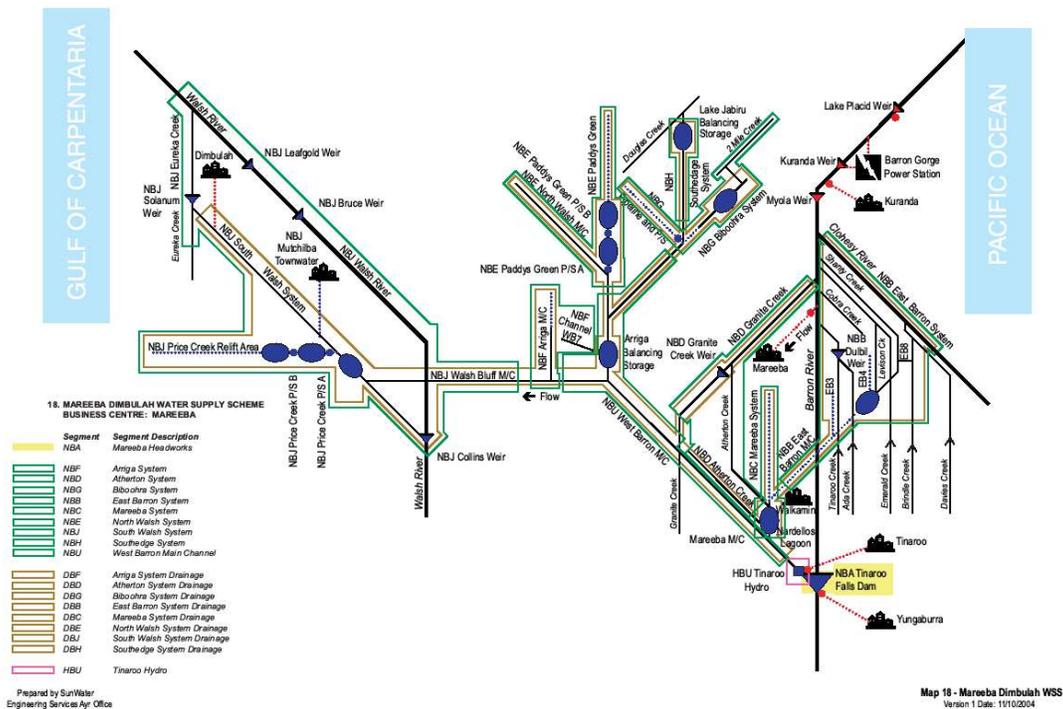
Figure 3 provides a schematic description of the assets or systems that make up each of these service contracts.

The scheme regulates sections of the Barron River by Tinaroo Dam, Granite Creek Weir and Dulbil Weir; and the Walsh River which is controlled by Leafgold Weir, Bruce Weir, Solanum Weir, Collins Weir as well as a distribution systems and balancing storages.

2.2 Location

Water from Tinaroo Dam is distributed by gravity through 176 km of main channel to the various sections of the scheme, namely Walkamin to the south of Mareeba, East Barron and the Mareeba area itself, Paddy's Green and Arriga to the west of the town, and along the south bank of the Walsh River through Mutchilba to beyond Dimbulah. Within these sections, a further 189 km of subsidiary channels distribute water to farms, dwellings and townships. Five balancing storages at Nardello's lagoon, East Barron, Arriga, Biboohra and Jabiru Lagoon ensure that effective supply is maintained throughout the system.

Figure 3 Mareeba Dimbulah Water Supply Scheme Schematic Diagram³



Note: Image last updated in 2004

2.3 Capacities

The following table lists the capacities of key infrastructure

Table 1 Mareeba Distribution Facilities⁴

Facility	Function	Capacity
Bruce Weir	Regulates Walsh River	970 ML
Collins Weir	Regulates Walsh River	600 ML
Dulbil Weir	Regulates Tinaroo Creek	271 ML
Leafgold Weir	Regulates Walsh River	260 ML
Paddy's Green PS-A	Supplies Paddy's Green Relift	54 ML/day
Paddy's Green PS-B	Pumps water from balancing storage to top storage	48 ML/day
Price Creek Relift PS-A	Supplies balancing storage from the South Walsh Main Channel	34 ML/day
Price Creek Relift PS-B	Pumps water from balancing storage to Price Creek upper storage	24 ML/day
Solanum Weir	Regulates Eureka Creek	345 ML
WB10 Pump station	Pump water up to small relief section	5 ML

³ Image sourced from DIS

⁴ Data sourced from Mareeba_Scheme_Manual

2.4 Operational Framework

Mareeba Distribution is operated and maintained from the SunWater Mareeba regional office.

Centralised support functions are provided through the SunWater head office in Brisbane.

2.5 Critical Assets

Facilities, or significant assets, considered to be critical to the operation of the Mareeba Distribution service contract are as follows:

- Weirs (Bruce, Collins, Dulbil, Leafgold, Solanum)
- Pump stations (Paddy's Green A and B, Price Creek A and B, WB10)
- Distribution channels
- SCADA

When developing the forward program of works as described in the Works Management System (WMS) and for prioritisation of planned and unplanned maintenance activities, the criticality of the facility is taken into account to ensure works are undertaken within an appropriate timeframe and take precedence over works associated with less critical facilities.

2.6 Asset Profile

2.6.1 Asset Replacement Values and Age Profile⁵

The following table provides a summation of the estimated replacement cost for all assets as used in the asset register for renewals planning. Non-operational assets (such as depots and offices) and externally owned assets (but managed by SunWater) have been excluded from this list.

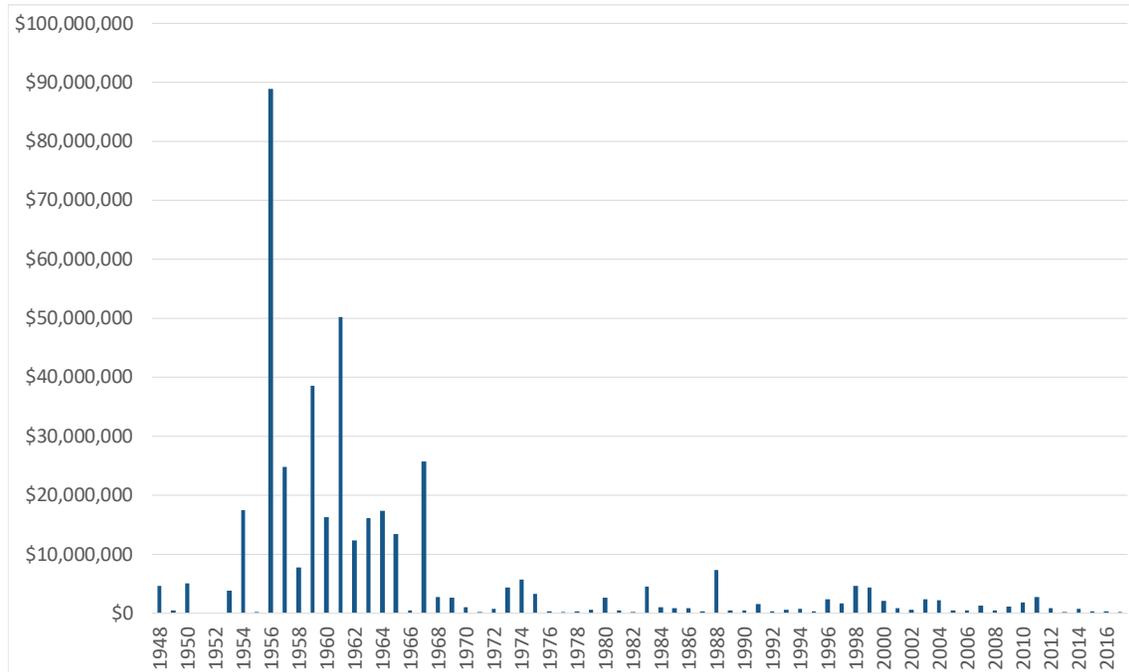
Table 2 Estimated Replacement Costs by Facility

Facility	Total
ARRIGA DISTRIBUTION	\$5,120,243
ARRIGA DRAINAGE	\$3,425,725
ATHERTON CK RIVER	\$20,155
ATHERTON DISTRIBUTION	\$9,833,028
ATHERTON DRAINAGE	\$208,058
BARRON RIVER DISTRIBUTION	\$172,124
BIBOOHRA DISTRIBUTION	\$4,625,919
BIBOOHRA PUMP STATION	\$111,979
BRUCE WEIR	\$4,681,174
COLLINS WEIR	\$3,982,704
DULBIL WEIR	\$431,802
EAST BARRON DISTRIBUTION	\$37,190,808
GRANITE CREEK DISTRIBUTION	\$32,269
LEAFGOLD WEIR	\$3,389,202
MAREEBA DISTRIBUTION	\$37,210,004
MAREEBA DRAINAGE	\$203,297
MDA SCADA	\$755,524
NORTH WALSH DISTRIBUTION	\$7,052,027
NORTH WALSH DRAINAGE	\$310,259
NORTH WALSH RELIFT	\$11,180,549
PADDYS GREEN 'A' PUMP STATION	\$4,357,045
PADDYS GREEN 'B' PUMP STATION	\$1,818,997
PRICE CK 'A' RELIFT PUMP STN	\$1,276,727
PRICE CK 'B' RELIFT PUMP STN	\$379,939
PRICE CREEK A RISING MAIN	\$4,789,514
PRICE CREEK B RISING MAIN	\$1,350,903
PRICE CREEK RELIFT CATHODIC PR	\$94,918
PRICE CREEK RELIFT DISTRIB	\$2,900,190
SOLANUM WEIR	\$1,853,579
SOUTH WALSH DISTRIBUTION	\$90,597,922
SOUTH WALSH DRAINAGE	\$1,399,374
SOUTHEDGE DISTRIBUTION	\$17,931,419
SOUTHEDGE DRAINAGE	\$117,243
WALSH BLUFF DISTRIBUTION	\$11,753,303
WALSH RIVER DISTRIBUTION	\$187,201
WB10 RELIFT DISTRIBUTION	\$1,058,706
WEST BARRON DISTRIBUTION	\$147,429,520
	\$419,233,349

⁵ Table data sourced from Asset register as extracted on 28/11/2017

The following figure provides an age profile for the Mareeba Distribution showing the years in which the majority of the assets were constructed.

Figure 4 Mareeba Distribution Age Profile



2.6.2 Risk and Condition Profile⁶

The following table provides a summary of the condition and risk profiles for the Service Contract assets.

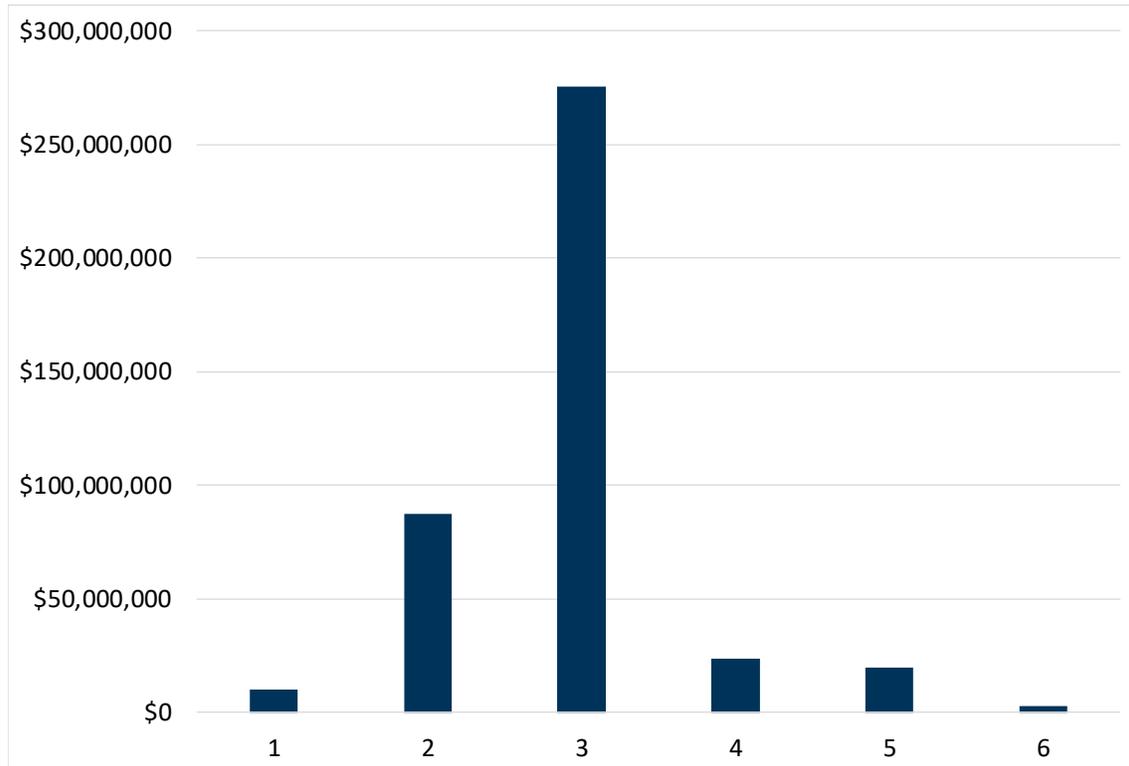
There are a number of assets that do not have a specific condition or risk score for logical reasons as described in the relevant assessment methodology manual

Table 3 Mareeba Distribution Risk and Condition

Condition	Risk				Total
	1	2	3	4	
1	2.11%	0.28%	0.06%	0.01%	2.46%
2	16.83%	2.01%	2.04%	0.03%	20.92%
3	63.80%	0.70%	1.17%	0.02%	65.69%
4	5.24%	0.15%	0.25%	0.03%	5.67%
5	3.74%	0.69%	0.23%	0.02%	4.67%
6	0.54%	0.04%	0.01%	0.00%	0.59%
Grand Total	92.27%	3.87%	3.76%	0.11%	100.00%

⁶ Data sourced from combination of FL Register and C&R Register as at 28/11/2017

Figure 5 Condition Profile



Description of Condition Ratings are:

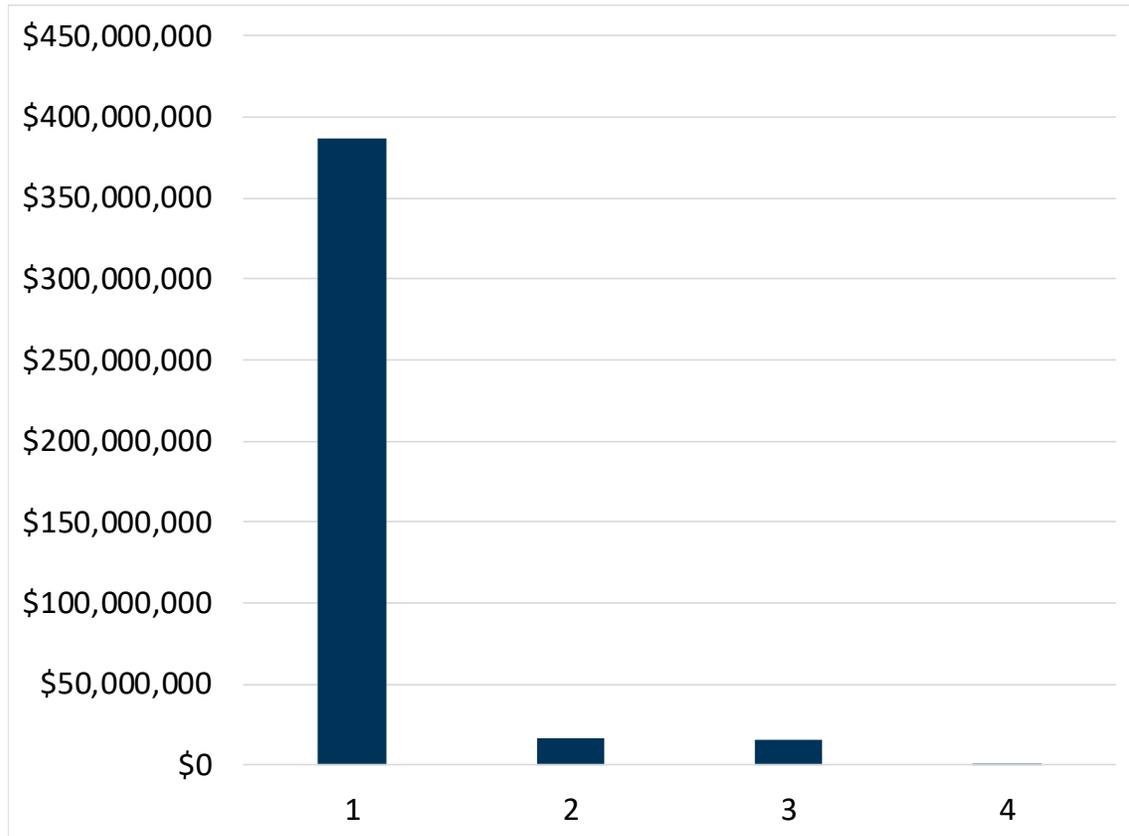
- 1 Perfect, as-new condition
- 2 Minor defects only
- 3 Moderate deterioration with minor refurbishment required to ensure ongoing reliable operation.
- 4 Significant deterioration with substantial refurbishment required to ensure ongoing reliable operation.
- 5 Major deterioration such that asset is virtually inoperable.
- 6 Asset has failed and is not operable.

Of the assets with a condition score approximately 89.1 per cent by value are in condition 3 or better, although only 23.4 per cent are in condition 1 or 2.

There are some 4.7 per cent in condition 5 and nearing end of life in addition to the 0.6 per cent that are in condition 6 and are no longer performing their function.

Overall the Service Contract assets are in acceptable condition although the majority of assets by value are in a condition requiring some level refurbishment to maintain optimal operations.

Figure 6 Risk Profile



Description of risk ratings are:

- 1 Low
- 2 Medium
- 3 High
- 4 Extreme

92.3 per cent of all assets have a risk score of 1 (Low)

3.9 per cent Medium

3.8 per cent High

0.1 per cent Extreme

The High and Extreme risk assets represent a small proportion, by value, of the Service Contract portfolio and do not present any significant risk exposure issues for the service contract.

2.7 Customers

2.7.1 Irrigation

Water is supplied for irrigation of mangoes, bananas, pawpaws, various citrus, avocados, general horticulture, sugar cane, tea-trees and coffee and many other crops.

Until recent times, tobacco was the major crop grown in the area. Sugar cane is now the dominant crop. Production is spread across the whole scheme but is centred mainly around the Arriga flats where a sugar mill has been constructed.

In recent years plantations of mango, banana, pawpaw, avocado, lychee, macadamia, citrus and other nuts and fruits have been established.

There is also a significant market garden industry that supplies southern consumers. Tropical grasses and legumes for seed production are also cultivated.

Other water uses include irrigation of crops such as grapes, stone fruits, custard apples and flowers, and irrigation of pastures for beef cattle fattening and stud breeding.

2.7.2 Urban Water Supplies

The townships of Tinaroo, Walkamin, Mareeba, Kuranda, Mutchilba, Dimbulah and Yungaburra are supplied from the scheme.

2.7.3 Mareeba Distribution Water Entitlements⁷

The following table identifies the water entitlements as published in the 2018/19 Mareeba Distribution NSP.

Table 4 Mareeba Distribution Customer Entitlements

Customer Segment	No. of Customers	Water Entitlements (ML)	High Priority Water Entitlements (ML)	Medium Priority Water Entitlements (ML)
Irrigation		144,538	0	144,538
Urban		1,153	421	732
Industrial		1,243	135	1,108
SunWater (excluding distribution loss)		0	0	0
SunWater distribution loss		45,000	8,000	37,000
Service Contract Total	1,097	191,934	8,556	183,378

SunWater entitlements relate to channel system distribution losses.

2.8 Service and Asset Standards

Water is stored and distributed by SunWater within the Mareeba Dimbulah Water Supply Scheme in accordance with the Barron Resource Operations Plan (ROP) 2005 and Water Act. SunWater Ltd is the Resource Operations License (ROL) under the ROP and holds water supply contracts with allocation holders.

⁷ Sourced from 2018/19 NSP, 20 June 2018 version

2.8.1 Water Supply Arrangements and Service Targets

Water distribution arrangements for the Mareeba Distribution and Mareeba Supply are set out in the *Mareeba Dimbulah Water Supply Scheme - Water Supply Arrangements and Service Targets* document (refer <http://www.sunwater.com.au/schemes/mareeba-dimbulah/scheme-information/rules-and-targets>).

These arrangements detail how water is to be distributed throughout the Mareeba Dimbulah scheme and considers channel and river customers, supply rates, water ordering, planned shutdown timing, notices and durations, unplanned shutdowns and dispute resolution. The arrangements have been developed in consultation with customer representatives and are aimed at achieving sustainable, efficient and equitable delivery of water allocations.

Of relevance to the asset management plan and the potential need for capital intervention works is the following target:

- Channels and River customers – No customer will experience more than **10 unplanned interruptions** per water year.

Performance reporting against these service targets will identify any below target performances which will be investigated for possible rectification works.

2.8.2 Risk Management

SunWater has developed a business model for determining the set of assets due for renewal over the forecast period. This model is risk based; assets are assessed for condition and risk which is used in combination with anticipated asset lives to determine the type of intervention strategy required and the timeframe involved.

This risk model and SunWater's acceptable risk threshold drives the majority of asset renewals and refurbishment based works.

Details of this risk based model are provided in the SunWater Documents:

- ***Doc#956033 - Whole of Life Maintenance Strategy & Object Codes***
- ***AM20 Methodology for Risk Assessment of Infrastructure Assets***
- ***AM21 Asset Refurbishment Planning Methodology for Condition Assessments of Assets***

2.8.3 Compliance Requirements

2.8.3.1 Resource Operating Plan (ROP)

This has been replaced by Mareeba-Dimbulah Water supply scheme Operations Manual

The *Barron Resource Operations Plan 2005 (ROP)* implements the provisions of the *Water Resource (Barron) Plan 2002* and is intended to drive water resource innovation and efficiency to benefit the region's community. The ROP sets out rules to guide supplemented water management in the Mareeba Dimbulah Water Supply Scheme and implements strategies to support a number of ecological outcomes including monitoring requirements to assess performance against the water resource plan.

SunWater Ltd has been granted the Resource Operating Licence (ROL) for the Mareeba Dimbulah Water Supply Scheme under the Barron Resource Operations Plan (ROP) 2005.

As the Mareeba Dimbulah Water Supply Scheme ROL holder, SunWater is required to operate the scheme in accordance with attachment 8 of the ROP which covers the following:

- Operating and environmental management rules:

- Water sharing rules:
- Dealing with water allocations:
- Seasonal water assignment rules:

Provisions are made under Chapter 11 of the Mareeba Dimbulah ROP to make amendments to the plan in accordance with the *Water Resource (Barron) Plan 2007* and/or relevant sections of the *Water Act 2000*.

2.8.3.2 Queensland Competition Authority (QCA)

The Queensland Government sets the water prices SunWater charges irrigators for water supply. The Queensland Competition Authority (QCA) undertakes the price reviews as directed by the Government.

In May 2012, QCA released its 'SunWater Irrigation Price Review: 2012-17' Final Report. The recommendations of the report were subsequently approved by the Queensland Government where the *Rural Water Pricing Direction Notice (No1) 2012* was issued under section 999 of the *Water Act 2000*. The current irrigation price paths set for SunWater apply until 30 June 2017.

In 2016, the Government decided to delay the next QCA price review by two years to allow prioritisation of the local management reform of SunWater's channel schemes (Local Management Arrangements). In the interim, the QCA proposed to set the price path for the period 1 July 2017 to 30 June 2019 by continuing the current irrigation pricing policies. This approach used the QCA recommendations (from its last reviews) as the cost target for each scheme or tariff group and reflect the minimum costs of supply for operating costs and asset maintenance costs, but excludes a commercial rate of return.

2.8.3.3 Workplace Health and Safety

SunWater is required by law to comply with the *Work Health and Safety Regulation 2011*. This regulation states that a duty holder managing risks to health and safety must eliminate risks so far as is reasonably practicable. If it is not reasonably practicable to eliminate the risks the duty holder must minimise those risks so far as is reasonably practicable. The regulation also states that risks greater than significant to be mitigated/ controlled.

As such SunWater has a robust system in place to provide a duty of care to its employees, customers, contractors and visitors. Operating costs are invested annually to ensure this duty remains up to date and relevant.

Where the assets present a WHS risk, or where legislative changes require it, programs of safety improvements may be rolled out to protect the operators, visitors, customers and contractors.

2.8.3.4 Other Legislation

There are many standards and regulations which SunWater is required to comply with regarding specific asset types. Examples include: ramps and ladders, lifting equipment, access and egress, lighting, fire and electrical.

SunWater ensures all assets are compliant with current codes, legislations and standards and monitors for changes and updates that may require further asset investment to achieve compliance.

2.8.4 Continuous Improvement

SunWater undertakes a number of studies and investigations each year in order to identify opportunities to improve the efficiency or effectiveness of the service contract. Projects are identified on an as needs study and may apply across multiple service contracts or be specific to a service contract or specific assets. Such investigations and studies include:

- Energy usage and efficiency improvements for pump stations
- Water loss studies for channel and pipeline systems

2.9 Current and Future Demand

2.9.1 Current Demand

The Mareeba Scheme was originally designed and constructed to supply irrigation to tobacco. The tobacco crops were seasonal with a lower overall water demand, and historically less than 60 per cent of allocations were used.

In recent years tobacco is no longer grown but has been replaced with more extensive and various cropping with higher demands spread out throughout the year. In recent years due to more cropping and drier seasons this usage of allocation has increased to approximately 80 per cent.

This higher demand and lower storage availability and lower Announce Allocation has driven permanent water trading prices to a high level and also resulted in a temporary trade market.

High demand periods are in the drier months from July to December which also coincides with post-sugar cane harvest and fruit production months of the year. Demand reduces once summer storms commence and monsoonal wet season from January to April.

Demand is consistent across the water year with approximately 700 system customers using water for domestic type use, some crops are fertigated even in the wet season while other crops require constant water application.

Four of the five small pump stations have two/three pumps each, with only a short period each year during which all the pumps are running simultaneously. For much of the year each pump station has a standby pump available. The ability to perform shutdown maintenance on these sites is not expected to cause supply issues. The single pump station only supplies 3 customers and they uniquely are on a stringent 1 in 3 roster system to take water. Only 10 per cent of the Mareeba scheme is in the relift areas supplied from pump stations with the remainder gravity fed from the channel system from Tinaroo Falls Dam.

Water usage patterns have experienced change since the scheme was introduced. The original intent of the scheme was to supply water for tobacco and the capacity of the scheme was designed to supply only to tobacco suitable soils. Tobacco has been replaced over the last 20 years with various high water demand crops such as sugar cane, avocados, bananas, other crops and tree types. These new crops are now planted over the entire farm area on soils that were not originally intended to be supplied. The demand have increased overall, and there is now no distinct crop requirement season meaning pressure is placed upon the scheme to deliver water on a consistent continual basis year round.

2.9.2 Future Demand

With increasing demand and supply being limited due to dry season there is now a very strong and expensive water trading market.

Large corporate farmers are purchasing properties within the scheme and have plans to expand their enterprises. This includes expanding both crop areas and moving towards higher value crops. 2015 figures show approximately \$400 million farm gates sale were generated on farms supplied by the scheme. This is expected to increase over the next 5 years with limitations on significant further expansion due to the availability of further water.

While there are large areas of unirrigated land within the scheme, expansion into these areas is limited by the availability of water, meaning expansion is unlikely at this time.

Modernisation through improved system monitoring and improved customer water ordering would increase delivery efficiency and reduce losses in the scheme. SunWater has 45,000ML of loss allocation water available and on average about 30,00ML of water is lost each year. This may allow for additional water sales and use of the scheme.

2.10 Water Availability and Reliability

Records from 2002 onwards show 100 per cent of High priority entitlements have been allocated at the start of each water year (1 July), except for 2002 which was achieved in September that year, a lag of 2 months.

Also during this time, Medium priority entitlements were 100 per cent at the start of the water year, or later as follows:

- 10 Sept 2002 – 2 months
- 16 Feb 2004 – 7 months
- 1 Sept 2005 – 2 months
- 1 Nov 2007 – 4 months
- 1 Oct 2008 – 3 months
- 1 Oct 2009 – 3 months
- 1 Oct 2010 – 3 months
- 1 Aug 2013 – 1 month
- 1 Feb 2016 – 7 months
- 1 Feb 2018 – 7 months, this was the only year with less than 100 per cent allocations, although the final announced allocation was substantial (94 per cent).

The water supply has been consistent in catering to High priority customers, and while Medium priority customers are being allocated fully, management of timing is noted. Overall the supply is reliable.

3. Lifecycle Management Plans

3.1 Asset Planning Methodology

The following text provides an overview of the approach SunWater takes to planning for routine and non-routine asset expenditure. Details of each methodology are provided in relevant controlled documents for a more thorough understanding of the approach.

3.1.1 Routine Works

SunWater plans asset work on a routine (preventive) and non-routine basis. Routine work is currently defined as recurring work with a frequency of 12 months or less.

Routine work plans are developed based on industry specifications for each asset, SunWater experience, compliance requirements and improvements in technology. The program consists of inspections, surveillance, condition monitoring and servicing of assets. The purpose of the program is to monitor the performance and condition of assets to ensure they continue to meet the agreed service standards and to detect when assets are operating outside of acceptable parameters so corrective action can be taken or scheduled.

Each asset type has a standard maintenance strategy that prescribes the frequency and timing of each type of maintenance activity. For example, a guard valve will have three monthly and twelve monthly operational and maintenance tasks prescribed to ensure it is kept in an acceptable condition for operational reliability and reduces the need for non-routine work or unplanned routine work.

Assets and systems have undergone a risk assessment to determine the criticality of the asset and its components to the function of servicing the customer. As a result maintenance strategies are tailored to align with this risk. Higher risk assets will typically have an increased frequency of activities whilst very low risk assets may be run to failure if appropriate. Likewise, response times to unplanned events are aligned with these risk levels.

These maintenance strategies have undergone extensive analysis to ensure the required function, performance, safety and compliance is achieved at the lowest cost to the end user.

This asset management plan focuses on the outcomes of the routine works planning process and the potential implications or issues at a scheme level.

3.1.2 Non-Routine Works

SunWater has an extensive asset register including a structured asset hierarchy of assets or systems, such as pump stations, so key items such as condition, risk rating, replacement value and remaining life can be recorded against individually replaceable parts. The model SunWater applies to this data provides a draft plan of works over the forecast period. While this AMP refers to the next six years, the QCA looks at the next 30 years for price path considerations. Both however, draw on the same data. The identification of non-routine work is initially driven by a combination of the asset condition and risk.

As this information is presented at the asset or equipment level, the asset planner considers a number of factors in order to translate this into a set of proposed projects for the next financial year. Factors taken into account include:

- Is the work really required? Can it be deferred? Will deferring it result in a low risk of failure or poorer customer service?
- What is the best option for the work? Refurbishment, replacement or modified maintenance?

- Can the work be aggregated into a larger project for the facility or an asset type program to deliver economies of scale?
- Does the work generally align with the lifecycle strategy for the asset?
- Can the project or aggregate of projects be achieved within the financial year?
- Does the overall expenditure forecast align with the agreed QCA price path? Rationalisation of projects may be required in order to fit within the price path however where appropriate or necessary the price path can be exceeded giving due consideration to the past overall expenditures and future years forecasts.

Ongoing updates and improvements to the proposed non-routine works plan occur throughout the year in the lead up to the budget submission phase. An updated project list is maintained in SunWater's SAP Works Management System (WMS) and undergoes continual refinement and change. The financial forecast presented in this AMP represents a point in time view of the proposed works and will likely to have undergone a number of changes before and possibly after budget approval.

Year 2 and beyond proposed works are typically not translated into projects for the following reasons:

- The environment has a significant impact on the achievement of the proposed works plan. For example, times of flood may require projects to be extended or deferred into the following year.
- Major climatic events such as Cyclones may require a complete change to the proposed works plan.
- Unplanned asset failures may require planned projects to be deferred.

As there are a number of significant issues that can largely undo any planned works for Years 2 and beyond, it is considered by SunWater good business practice to keep this primarily as a forecast of overall expenditure rather than agreed projects.

In addition to the consideration of risk and condition to developing the non-routine works plan other expenditure drivers exist that may generate works.

These include:

- Performance reports identifying assets or systems below the desired target. For example, pump efficiency, reliability of supply, unplanned outage costs etc.
- Service and Asset Initiatives may arise from the Corporate plan, Statement of Corporate Intent or other sources that define a project
- Growth and future demand may drive the need for augmentation or expansion projects as possible disposal or rationalisation projects
- Compliance based projects may be required to meet changes in legislation such as WHS, regulator requirements or equipment compliance standards.

The following section on expenditure drivers identifies the reasons for the proposed routine and non-routine works.

Further details on SunWater's approach to the preparation and scheduling of non-routine works can be found in the following SunWater documents:

- ***#1587501-Asset Management System Manual***
- ***#1599118-Asset Management Planning Methodology Paper***

3.2 Drivers of Expenditure

The following section draws out the key issues for the service contract regarding performance, compliance, growth and risk that are driving the proposed works program for the next six years.

3.2.1 Network Services Plans

Stemming from the QCA's 2012 review of irrigation prices, SunWater publishes annual Network Service Plans (NSPs) based on service contracts as required by the QCA's pricing practices recommendation. The documents are published in advance of the QCA recommendations to provide customer review and comment. The NSPs aligned to the Mareeba Dimbulah Water Supply Scheme are Mareeba Distribution (MIM), and Mareeba Supply (MBM).

SunWater reviews the NSPs annually and prepares performance reports for customer representative bodies. The NSPs and the Annual Operations Reports can be found on the SunWater website <http://www.sunwater.com.au/schemes/mareeba-dimbulah/scheme-information/pricing>.

The NSPs primarily measures and reports on financial performance against budget and QCA targets. As the financial year progresses it may be necessary to defer some projects, modify budgets for some and bring others forward into the current year.

At the time of preparing this AMP there are no material changes to the proposed works program that will influence the six-year forecast.

3.2.2 Water Supply Service Targets

The following table provides performance reporting against the Water Supply Agreement and Service Targets for the entire scheme. This includes the service contracts for Mareeba Distribution and Mareeba Supply.

The unplanned shutdown which exceeded the 48 hour timeframe for restoration of service (Peak Demand Period) was on a leaking pipe at Paddy's Green Relift and was caused by soft ground requiring extra time to dry before repair works could be performed.

All other performance measures were within the bounds of the water supply agreement and hence are not driving any specific projects.

Table 5 Water Supply Performance Measures 2017/18

	Planned Shutdowns		Unplanned Shutdowns		Meter Repairs	Max No. of Interruptions	Complaints & Enquiries		
	No. of Events	No. of Notification Failures for Planned Events	No. of Events	No of Duration Failures for Unplanned Events	Faults causing restriction to supply will be repaired within	No. of Customers Exceeding Target	No. of Complaints	No. of Complaints Exceeding Target (initial)	No. of Complaints Exceeding Target (resolution)
July 2017	0	0	10	0	0	0	0	0	0
August 2017	1	0	3	0	0	0	0	0	0
September 2017	0	0	4	1	0	0	0	0	0
October 2017	0	0	3	0	0	0	0	0	0
November 2017	0	0	7	0	0	0	0	0	0
December 2017	0	0	1	0	0	0	0	0	0
January 2018	0	0	4	0	0	0	0	0	0
February 2018	0	0	5	0	0	0	0	0	0
March 2018	4	0	5	1	0	0	0	0	0
April 2018	6	0	3	0	0	3	0	0	0
May 2018	5	0	1	0	0	0	0	0	0
June 2018	0	0	0	0	0	0	0	0	0
Total YTD for 2017/18	16	0	46	2	0	3	0	0	0

3.2.3 Corporate Driven Projects

Strategic level projects defined and driven by the Corporate Business Plan or Statement of Corporate Intent are identified here.

For the Corporate Plan 2017-22 strategic level projects have only been identified for headworks assets including Dam Safety Upgrades and Flood Repair Works.

3.2.4 Compliance Related Works

A number of compliance driven programs have been established in the WMS. These include programs such as:

- Electrical switchboard inspections, testing and tagging
- Lifting equipment inspections, testing and tagging
- Bridge inspections

3.2.5 Growth and Future Demand

No growth or future demand related projects have been identified for the Mareeba Distribution service contract.

3.3 Strategic Direction for Scheme

No strategic direction statement is provided. Assumption for forecasting is existing services will continue as per current arrangements.

4. Financial Forecast

For a summary of the financial forecasts, refer to the relevant Network Service Plan (which is available on SunWater's web site).

5. AMP Improvement Plan

The following describes potential improvements that may be considered for implementation. Corporate level improvements apply across all AMPs whilst others are specific to this AMP.

5.1 Corporate Level Improvements

- Enhance the WMS to include a data field for each project to identify the work type, namely new asset, upgrade existing, replace, refurbish, disposal, study, investigation.
- Enhance WMS to include a data field to identify the primary driver for the works, namely compliance, service enhancement, condition and risk.
- Develop more asset related technical performance standards to guide and potentially drive the non-routine asset replacement and refurbishment programs. This could include for example measuring pump efficiencies in relation to condition, or monitoring water meter flow accuracies, and the impact of this on service standards. Implement procedures to measure these performance standards to feed into the planning process.
- Continuous improvement to current condition and risk based model to confirm the proposed timing of works generated is an acceptable starting point for the next year's works program development.
- Enhance the Functional Location asset register so condition and risk scores can be presented at a parent or facility level. At present, they are only provided at the asset or equipment level.
- Develop and document a strategic direction for each scheme and service contract to identify a more tangible understanding of how assets and services may change into the future so the more significant asset investment decisions can be made in the context of the anticipated life and function anticipated from the investment. In addition, clarify the goals and objectives for the scheme, systems or service contracts to support this future vision.

5.2 Improvements for this AMP

- Locality map and schematics at Service Contract level
- Improved performance reporting that links to the proposed works program (i.e. better demonstrate why the work is needed)
- Future AMPs should address feedback from customers
- Future AMPs should contain more accurate information. This requires SunWater to review AMP sources and update them to ensure relevant and up-to-date information.

5.3 Monitoring and Review Procedure

- This AMP shall be reviewed and updated annually in line with the NSP and Budget Cycle.
- Responsibility for review and update of this AMP rests with the Manager Strategy and Assurance in consultation with the other signatories at the front of this document.

6. References

- Strategic Asset Management Plan (SAMP)
- Mareeba Dimbulah Water Supply Scheme - Water Supply Arrangements and Service Targets
- Barron Resource Operations Plan 2005 (ROP)
- Water Resource (Barron) Plan 2002
- Rural Water Pricing Direction Notice (No1) 2012
- Work Health and Safety Regulation 2011
- Mareeba Dimbulah Water Supply Scheme – Scheme Operations Manual.
- #1587501-v1-Asset_Management_System_Manual,
- #1599118-v1-Asset_Management_Planning_Methodology_Paper.
- #1800010-v8-Bulk_Water_Assets_Strategic_Plan_2015
- #2320083-v8-2019 Network Service Plan – Mareeba Distribution Service Contract
- #2320082-v6-2019 Network Service Plan – Mareeba Bulk Water Service Contract