Gladstone Area Water Board

2015 Price Monitoring Investigation

Submission to the Queensland Competition Authority

September 2014

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2015 Price Monitoring Investigation

Submission by Gladstone Area Water Board

Gladstone Area Water Board

Executive Summary

Introduction

The Treasurer and Minister for Trade has referred Gladstone Area Water Board (GAWB) to the Queensland Competition Authority (the Authority) for a price monitoring investigation for the period from 1 July 2015 to 30 June 2020 (2016–2020[1]).

This price review is the fourth review conducted on GAWB's pricing practices by the Authority.[2] This review differs from previous investigations, as it is a 'price monitoring' investigation whereas previous price reviews were investigations about GAWB's pricing practices. A price monitoring investigation is understood to involve a more focussed and efficient pricing review by the regulator.

This submission sets out GAWB's forecasts in relation to each of the specific matters the Authority is to investigate as set out in paragraphs 2(a)–(g) of the Referral Notice. Appendix A lists these specific matters and includes references to the sections of this document where those matters are addressed.

GAWB will also provide the Authority with a pricing model (which will not be publicly released for reasons of customer confidentiality).

GAWB supports the role of the Authority to independently review GAWB's declared monopoly business activities. GAWB believes that the periodic independent and transparent assessment of its operations is of benefit to all its stakeholders.

As an essential service provider, GAWB is obliged to ensure that it delivers water supply services that are safe, secure, reliable and appropriately priced. Given its unique customer mix, GAWB is conscious of the consequences of service shortfalls whilst also being aware of the need to discharge its duties efficiently, given that it is customer charges that fund its operations. Accordingly, GAWB strives to meet the appropriate balance between cost minimisation and the consequences of supply failure.

Indicative prices

GAWB's pricing practices for the 2016–2020 regulatory period will result in an average real price reduction of 2%. This means that GAWB's average tariff will be lower in real terms in 2020 than it was in 2011.

Figure 1 shows GAWB's actual and indicative prices for representative zones over the 10-year period to 2020.

The indicative 2016 price for raw water in the Awoonga pricing zone is some 11% lower than the current price in real terms. In general, GAWB's prices will decrease in real terms in raw water pricing zones and increase slightly in real terms in potable water pricing zones.

GAWB's water prices are cost reflective – the actual costs incurred in delivering water services to customers are reflected in its prices.

Overall, most customers will see a real price decrease. Customer outcomes range from a decrease of 23% to an increase of 4%, before considering effects of changing to a maximum daily quantity (MDQ) based delivery price.[3]

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[1] The date conventions used in this document identify financial years by reference to the calendar year in which they end.

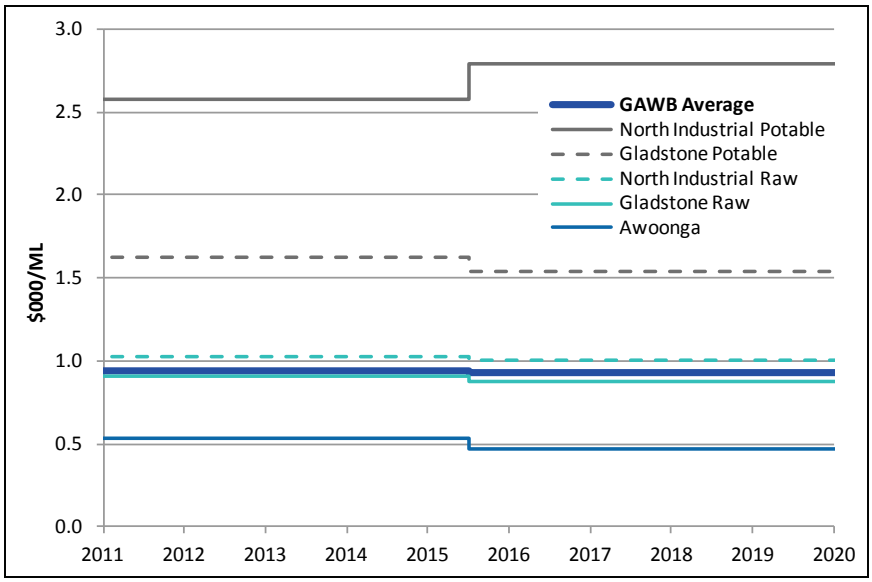
[2] The Authority also conducted a review of GAWB's Contingent Supply Strategy (CSS) between 2007 and 2009 (Parts A, B and C).

[3] Outcomes exclude the Curtis Island customers, for which no 2010 review comparison price is available.

In the potable water zones with price increases, the effect of a decreasing cost of capital is less than the aggregate cost impact of:

- specific capital projects required to maintain water quality and replace end-of-life assets;
- more reliable estimates of prudent and efficient operational expenditure; and
- significantly higher electricity costs than were forecast in 2010.

Figure 1: GAWB actual and indicative prices in real terms ($2016)



GAWB's prices compared

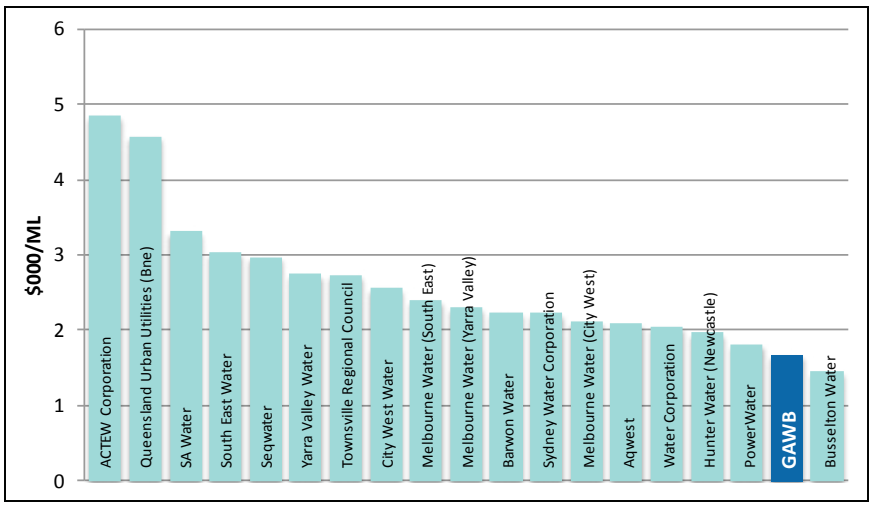
Simplistic comparisons of GAWB's prices to other service providers can be misleading. Prices are reflective of the cost of the specific service in a particular region, which is a function of a business's particular scale, customer density, topography and water sources (affecting storage costs, bulk water transport and treatment costs). That said, price is acknowledged as a key basis for public comparison between water service providers and can represent a valid indicator of efficiency.

GAWB engaged Synergies Economic Consulting,[4] to provide data illustrating potable water prices of a representative Australia-wide selection of other regulated water service providers, and GAWB has compared these prices to the weighted average potable delivery price charged to Gladstone Regional Council (GRC).[5] GAWB's 2015 weighted average price of $1,943/ML is at the lower end of the water service providers included in the analysis.

[4] Synergies, *Australian Water Prices: Gladstone Area Water Board*, August 2014, pages 11 & 13.

[5] Excluding reticulation charges and before capital contribution rebates and any other price adjustments.

Figure 2: GAWB 2015 weighted average potable water price compared to other regulated businesses



In summary, GAWB's prices are currently low compared to its peers and will remain low for the next five years.

GAWB service

GAWB's customer base is unique. Approximately 20% of the total water supplied by GAWB is supplied to GRC as potable water. GRC then on-sells this potable water to residential and business users. GAWB accepts its important responsibility to provide high-quality drinking water that is reliable and reasonably priced. For Gladstone to prosper as a centre of industry and commerce, GAWB embraces its role as a trusted and valued bulk water service provider to the region.

Industrial and power generation demand represents approximately 80% of the total water supplied. GAWB understands that any interruption to supply has the potential to disrupt the operation of these customers' multi-billion dollar facilities, which could result in the loss of substantial revenue to them.

GAWB's water supply services can be objectively described as reliable and efficient. In addition to GAWB's water prices comparing favourably to other regulated water service providers (Figure 2), GAWB's operations have been measured as being efficient. When compared to a peer group of similar Australian water service providers across a range of efficiency measures, GAWB's performance was consistently superior to the peer group.[6]

[6] MHC, *Gladstone Area Water Board: Operational Benchmarking*, July 2014.

As shown by the data in Table 1 GAWB provides a quality reliable water supply service.[7]

Table 1: Key reliability and quality performance measures 2011–2014

Key performance measures	2011	2012	2013	2014
Business goal – Meeting water needs				
Supply: Reliability				
Compliance with minimum water pressure expectation at customer supply points	100%	100%	100%	99.9%
Number of planned interruptions to supply	N/A	3	3	7
Number of unplanned interruptions to supply	Nil	1	1	Nil
Response time to a substantial incident within defined timeframes	N/A	100%	100%	100%
Water main breaks per 100km	2.37	3.31	1.0	6.0
System water losses	3.43%	3.97%	4.72%	7.0%
Supply: Quality				
Potable water fitness to drink	100%	100%	100%	100%
Percentage of non-complying tests for the health parameter E. coli	0.0%	0.0%	0.0%	0.0%
Percentage of non-complying tests for chemical and physical health parameters	0.0%	0.0%	0.0%	0.0%
Percentage of non-complying tests for aesthetic parameters	1.0%	1.3%	1.0%	0.4%
Number of substantiated potable water quality compliance complaints	1	Nil	Nil	Nil
Number of substantiated raw water quality compliance complaints	Nil	Nil	Nil	Nil
N/A: Not available – This was not a Key performance measure in 2011.				

It is worth noting that during the five-year period since the last price review GAWB experienced two extreme rainfall events (in December 2010 and January 2013). GAWB's ability to deliver a quality water supply during these events demonstrates the resilience of its operations. The January 2013 rainfall event (related to ex-tropical cyclone Oswald) was assessed as a one in 2,000-year rainfall event (the highest rainfall in the catchment on the historical record) and caused the highest raw water turbidity recorded since GAWB's establishment.

Comprehensiveness of GAWB's operating expenditure forecasts

The Referral Notice (Appendix A) requires review of operational expenditure in any function where GAWB's forecast expenditure in that function exceeds the level allowed in the Authority's 2010 pricing practices investigation by an amount that would give rise to a material increase in price.

Notwithstanding that it could not recover this higher expenditure in its prices, in the period 2011–2015, GAWB's operating expenditure (for Asset life cycle management and Operations) considerably exceeded the forecasts of the Authority's

[7] GAWB Fourth Quarterly Reports 2011–2014. Quality: 100% compliance is targeted by all water services providers delivering potable quality water, and typically achieved annually by 80 to 90% of providers. GAWB results align with those achieved by "larger" utilities. Reliability: System reliability parameters shown are suitable for a bulk water provider (http://www.nwc.gov.au/publications/topic/nprs/npr-2013-urban/11-bulk-utilities). The anomalous result in 2014 for system water losses principally resulted from a single major leak on the QAL pipeline, where pipeline repair was deferred to allow coordination of GAWB shutdown and customer minimum supply requirements. The increase in pipeline breaks is reflective of deterioration of pipelines in specific zones which GAWB plans to replace during the next regulatory period.

consultants that were engaged for the 2010 investigation. This expenditure was incurred to preserve the reliability of the network, and provides a more reliable baseline with which to compare the efficiency of the forecast expenditure (i.e. actual 2011–2015 compared to forecasts for 2016 and later years).

In its response[8] to the Draft Report issued by the Authority in 2010, GAWB was able to identify numerous errors or inadequacies in the reports of the Authority's consultants concerning operating expenditure. Accordingly, GAWB is of the view that the probative basis of these consultants' reports in recommending reductions in the forecast expenditure submitted by GAWB was unreliable.

If the Authority had accepted GAWB's operational expenditure proposals, the variances in actual expenditure in the current pricing period would have been substantially lower. Nonetheless, GAWB accepts there would still have been a variance between forecast and actual expenditure.

Since the last price review investigation, GAWB has undertaken comprehensive condition assessments of all operational assets and entered these into the Asset Management System (AMS). This now provides GAWB with a reliable platform upon which to forecast prudent asset management expenditure. These forecasts have been arrived at independently. Notwithstanding that independence, these forecasts are consistent with GAWB's actual expenditure since 2010.

Whilst expenditure in the functions of Asset life cycle management and Operations exceeded the amounts that GAWB was able to recover in prices in the current regulatory period, GAWB's operational expenditure in the functional areas of Strategy and asset creation and Corporate services generally accords with the outcomes of the 2010 price review.

GAWB's forecast operational expenditure is efficient: it is consistent with GAWB's real experience in recent years, compares favourably against benchmark performance[9] and it is assessed as efficient by a respected consultancy in the area.[10]

Capital expenditure

GAWB expects to incur $77.1 million of capital expenditure over the 2016–2020 pricing period. This expenditure is summarised by category in Table 2.

Table 2: Forecast capital expenditure 2016–2020

Project justification	Forecast CAPEX 2016–2020	
	$million	%
Risk mitigation	31.3	40.6
End of life replacement	41.1	53.3
Regulatory obligation	2.8	3.7
Capacity	1.8	2.3
Business process improvement	0.1	0.1
Total forecast CAPEX	**77.1**	**100.0**

GAWB's forecast capital expenditure for the 2016–2020 period has been independently assessed as being prudent and efficient.[11]

[8] GAWB, *Response to the Draft Report: Investigation of Pricing Practices*, May 2010, pages 60–82.

[9] MHC, *Gladstone Area Water Board: Operational Benchmarking*, July 2014.

[10] GHD, *Review of Operations and Asset Life Cycle Management Expenditure for GAWB's 2015 Price Review*, September 2014.

[11] Cardno, *Capital Expenditure Review – QCA: GAWB Capital Works Review*, September 2014.

GAWB's approach to capital expenditure conforms to its service provision philosophy. GAWB aims to ensure that the service it provides is aligned with the needs of its customers. This alignment requires an informed allocation of the risks inherent in the water supply and an equitable distribution of costs related to the provision of GAWB's water service to customers.

Through the development and publication of GAWB's 2013 Strategic Water Plan[12] GAWB has sought to better inform customers as to the inherent risks to the water supply and GAWB's proposed measures to address those risks. GAWB seeks to continue this engagement on an ongoing basis in relation to important water supply issues.

This five-yearly price review process provides a defined and formal mechanism through which GAWB is able to advise its intended future capital expenditure on its water supply system infrastructure and customers have the opportunity to provide detailed submissions in response. As a specialist water service provider, in framing its capital expenditure forecasts, GAWB has sought to articulate its assessment of the level of investment required to meet the planned targeted level of risk in the supply of water to customers. In preparing their submissions to the Authority, customers (individually) have an opportunity to articulate their preferred risk/cost balance for their respective businesses.

As can be seen in Table 2, 93.9% of GAWB's forecast capital expenditure relates to end-of-life replacement (53.3%) and risk mitigation (40.6%). This expenditure has been assessed by GAWB as necessary to maintain an appropriate level of risk mitigation in its water supply service (and has been independently validated by an engineering specialist as being prudent and efficient[13]).

A major item of risk mitigation expenditure is the planned offline storage reservoir at Toolooa (between Awoonga Dam and Gladstone). This storage will provide approximately 14 days water supply to the region in case of failure of the Awoonga Dam pump station. It will also allow GAWB to undertake necessary maintenance at the pump station and on the Awoonga to Toolooa pipeline infrastructure without interrupting supply. This project will improve supply security and will impact prices to delivered water customers by approximately $30/ML (a range of 1% to 3% depending upon the network services used).

Contingent Supply Strategy

Recognising that circumstances will arise in the future whereby GAWB will need to augment its water supply, it is critical that GAWB maintains the capability to respond to these circumstances and augment supply in a manner that is effective, efficient and meets the needs of customers.

A key component of GAWB's Commercial Framework is the Contingent Supply Strategy (CSS). The CSS represents GAWB's strategic approach to efficiently respond to either an increase in demand that causes aggregate demand to exceed its annual water allocation from Awoonga Dam, or supply shortages caused by drought. The CSS provides GAWB with this capability by identifying its preferred alternative supply option and undertaking sufficient work to attain and maintain the desired state of preparedness for water source augmentation. Attaining and then maintaining a state of preparedness significantly reduces the lead-time for implementation of the relevant source augmentation.

CSS preparatory works undertaken have reduced the implementation timeframe for the non-LFRIP (Lower Fitzroy River Infrastructure Project) components of GAWB's preferred water source augmentation solution – the Gladstone Fitzroy Pipeline Project (GFP) – from a period of 6 to 8 years down to a period of 3 years[14] from the augmentation trigger event.[15]

[12] GAWB, *Strategic Water Plan*, November 2013, pages 67–70.

[13] Cardno, *Capital Expenditure Review – QCA: GAWB Capital Works Review*, September 2014.

[14] GAWB has undertaken preparatory work to attain and maintain a state of preparedness to enable construction and implementation of the non-water storage components of the GFP (including pipeline, water treatment plant, pump stations and reservoirs) within 3 years from an augmentation trigger event. Significant progress towards attaining a comparable state of preparedness in relation to the LFRIP has been

This reduction in lead-time has real value – reduction in/avoidance of unnecessary expenditure (unnecessary augmentations) and by deferring significant expenditure until as 'late as it is safe', which also facilitates the exclusion of a forecast augmentation from the 20-year planning period.

In 2010, the Authority recommended that CSS expenditure incurred after April 2008 should not be included in the Regulated Asset Base (RAB). That is, the Authority contended that GAWB ought to have abandoned preparatory works when the drought initially broke. Expenditure totalling approximately $14.3 million was excluded from the RAB (which means that customers' prices do not currently recover a 'return on investment' or 'return of investment' for that expenditure) in the 2016–2020 pricing period. Allowing for GAWB's holding costs (at the current regulatory period WACC), the value of the excluded expenditure is currently $22 million.

Subsequently, GAWB undertook quantitative analysis to demonstrate that its decision to proceed with CSS expenditure was prudent and efficient because it minimised the expected long-run cost of water to customers.

In any event, as the commencement of a drought can only be identified retrospectively, it would be a flawed strategy to seek to deploy an 8 year solution with much less than 8 years water supply in storage. The only way that GAWB can credibly respond to drought with a comprehensive supply solution is to invest in a contraction of the time required to deliver the additional water as GAWB has done.

Accordingly, after serious consideration, GAWB believes that it is appropriate to roll-in the expenditure previously excluded from the RAB. Roll-in of the $22 million expenditure will impact tariffs by approximately $10/ML (less than 1% for most customers).

Demand

For 2016–2020, GAWB's demand forecast comprises currently contracted demand and anticipated growth. For the remainder of the 20-year price-averaging period (2021–2035), GAWB's forecast results in full utilisation of its water allocation from Awoonga Dam at the end of the planning period. GAWB considers that this approach:

- recognises that the primary purpose of the 20-year planning period is to share the cost of spare capacity between current and future users;
- is consistent with the Authority's objectives when establishing the 20-year planning period; and
- is consistent with GAWB's water supply agreements and the CSS (because augmentations are not 'priced in' based on speculative forecasts).

WACC

The Authority is currently undertaking a review of its weighted average cost of capital (WACC) calculation methodology, but has yet to publish its benchmark WACC for GAWB. In the absence of this benchmark, GAWB is unable to make definitive submissions upon WACC as part of its pricing practises for the purposes of the present investigation. GAWB understands that parameters upon which the benchmark WACC will be determined by the Authority will be published in the near future. GAWB proposes to provide detailed submissions on WACC within a reasonable time of the Authority publishing its benchmark WACC. For the purpose of providing indicative pricing, GAWB has calculated an indicative cost of capital for the 2016–2020 regulatory period of 6.85%, which is significantly lower than the rate used to set prices for the current regulatory period.

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made. These preparatory works to provide capability to construct and implement the LFRIP within a 3-year period (from augmentation trigger) are currently being progressed and will be staged to balance costs incurred with attaining and maintaining the required state of preparedness.

[15] While the GFP is currently GAWB's preferred option, GAWB is also monitoring other options and technologies to ensure it is in a position to provide the most efficient supply augmentation available when the need arises.

The indicative WACC has been determined with reference to GAWB's current WACC methodology, but varied to:

- take into account the Authority's recent benchmark WACC position paper for SEQ water retailers; and
- facilitate the introduction of a trailing average cost of debt (and consequential change to the term to maturity of the risk-free rate proxy from 5 years to 10 years).

The benefits of including a trailing average cost of debt in the WACC calculation are that:

- GAWB can adopt usual debt portfolio refinancing practices (refinancing 10% of its debt requirements each year, rather than attempting to refinance the entire portfolio over a few weeks at every price review); and
- prices will be more stable over time.

The trailing average cost of debt has been adopted by the Australian Energy Regulator (AER) and is supported by Queensland Treasury Corporation (QTC).

Price structure

As foreshadowed in GAWB's submissions to the 2005 and 2010 price reviews and in GAWB's Strategic Water Plan,[16] GAWB intends to change the way it charges for use of the delivery network. The current volume-based charges are less efficient and less equitable. A charging framework based on customers' MDQs better reflects the cost of providing pipeline and reservoir capacity.

GAWB intends to transition customers to MDQ-based delivery charges from 2015. GAWB has met with customers to discuss MDQ pricing and has provided customers with 'shadow bills' illustrating how a change to MDQ pricing would affect each of the customer's connection points.

During the five-year transition period, customers will be charged the lesser of the MDQ-based delivery tariff and a grandfathered volume-based tariff. Under this transition arrangement, customers with lower cost demand profiles (customers that use water consistently throughout the month and year) will immediately receive lower bills. Customers with higher cost demand profiles (customers with demand peaks) will transition to higher bills over time, but will be able to assess whether the additional cost is sufficient to justify investment to change their existing demand profiles (e.g. by installing on-site storage or changing operational protocols).

In addition to retention of the grandfathered volume-based tariff, GAWB intends to introduce three further mechanisms to protect customers during a five-year transition to MDQ-based tariffs:

- the ability for customers to re-specify MDQs;
- no delivery over-run charges for five years; and
- a revenue cap form of regulation for delivery services supplied to existing customers.

GAWB's standard terms and conditions for the supply of water services include provisions that oblige GAWB to comply with the outcomes of prior investigations by the Authority. These provisions are summarised in a schedule to the water supply agreements entitled 'Pricing Principles' and are intended to be updated from time to time.

Attached as Appendix B to this document is a mark-up showing the changes that GAWB plans to make to these Pricing Principles with effect from 1 July 2015.

[16] GAWB, *Strategic Water Plan*, November 2013

Form of regulation

GAWB currently operates under a price cap form of regulation. Under this form of regulation GAWB bears the risk that customer demand differs from the forecasts used to set tariffs.

In submissions to the 2005 and 2010 price reviews GAWB argued that a price cap form of regulation was inappropriate and proposed a revenue cap form of regulation. The Authority did not accept GAWB's proposals in part due to lack of regulatory precedent. However, revenue caps or hybrid price/revenue caps are now in place for regulated water businesses in South Australia, Victoria, New South Wales, and the Australian Capital Territory. The AER uses revenue caps to regulate electricity transmission and distribution companies throughout the National Electricity Market.

GAWB plans to introduce a hybrid price/revenue cap similar to that approved by the ACT's Independent Competition and Regulatory Commission (ICRC) for ACTEW Corporation and NSW's Independent Pricing and Regulatory Tribunal (IPART) for Sydney Water. In particular there will be a symmetrical 5% threshold for triggering the revenue cap: differences between actual and forecast revenue in excess of the 5% threshold would be rolled-forward (with balances earning/paying interest at the WACC for that year) to the beginning of the next regulatory period.

Under this approach:

- GAWB retains revenue from additional demand up to 5% over that forecast – meeting the Authority's requirement for an incentive to facilitate retention of customers and connection of additional customers;
- customers bear the risk of demand falling more than 5% below that forecast – meeting GAWB's requirement to effectively cap the down-side exposure to demand; and
- no changes are made to prices within the regulatory period other than indexation to movements in the Consumer Price Index (CPI) – meeting the Authority's requirement for price stability.

As discussed above, GAWB also plans to introduce a revenue cap form of regulation for delivery services to existing customers (for this regulatory period only) to facilitate transition to MDQ-based delivery prices.

Conclusion

GAWB's revised pricing practices for the 2016–2020 regulatory period will result in an average real price reduction of 2%. This means that GAWB's real tariffs will not have increased for 10 years and will in fact be lower in real terms in 2020 than they were in 2011.

The prices that GAWB has published are indicative because no benchmark WACC is available at this time. GAWB understands that this issue will be resolved prior to the publication of the Authority's draft report.

These indicative prices are also generated from a WACC that has been based upon the current cost of debt inputs. These inputs may change before prices are finalised in June 2015.

It is noted that small variances in WACC can have a material impact upon price. Accordingly these qualifications around the indicative price that has been published are considered important.

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Glossary

Term	Meaning
ACCC	Australian Competition and Consumer Commission
ADPS	Awoonga Dam Pump Station
AER	Australian Energy Regulator
AFC	Acceptable Flood Capacity
ALCM	Asset Life Cycle Management
AMS	Asset Management System
ARR	Aggregate Revenue Requirement
Authority	Queensland Competition Authority
Base Year	2015, i.e. the year ending 30 June 2015
CAPEX	Capital Expenditure
CPI	Consumer Price Index
CSS	Contingent Supply Strategy
current regulatory period	2011–2015, i.e. the five year period ending 30 June 2015
DERM	Department of Environment and Resource Management
DEWS	Department of Energy and Water Supply
DMP	Drought Management Plan
DORC	Depreciated Optimised Replacement Cost
DWQMP	Drinking Water Quality Management Plan
ESC	Essential Services Commission (Victoria)
ESCoSA	Essential Services Commission of South Australia
FFO	Funds from Operations
G+S	Gilbert + Sutherland
GAWB	Gladstone Area Water Board
GFP	Gladstone to Fitzroy Pipeline Project
GL p.a.	Gigalitres per annum
GRC	Gladstone Regional Council
GWTP	Gladstone Water Treatment Plant
ICRC	Independent Competition and Regulatory Commission (Australian Capital Territory)
IFR	Instantaneous Flow Rate
IPART	Independent Pricing and Regulatory Tribunal (New South Wales)
LCMP	Life Cycle Maintenance Plan
LFRIP	Lower Fitzroy River Infrastructure Project
LNG	Liquefied Natural Gas
LRMC	Long-Run Marginal Cost
L/s	Litres per second
MCC	Motor Control Centre

Term	Meaning
MDQ	Maximum Daily Quantity
MHC	Marchment Hill Consulting
ML	Megalitres
next regulatory period	2016–2020, i.e. the five year period ending 30 June 2020
OH&S	Occupational Health and Safety
PwC	PricewaterhouseCoopers
QCA	Queensland Competition Authority
QCA Act	*Queensland Competition Authority Act 1997*
QCA forecasts	The Authority's 2010 forecasts of GAWB's expenditure for 2011–2015
QTC	Queensland Treasury Corporation
RAB	Regulated Asset Base
ROI	Return on Investment
ROP	Resource Operations Plan
SCADA	Supervisory Control and Data Acquisition
SEQ	South East Queensland
SKM	Sinclair Knight Merz
SWP	Strategic Water Plan
Synergies	Synergies Economic Consulting Pty Ltd
VSD	Variable Speed Drive
WACC	Weighted Average Cost of Capital
WWL	Wedgewood White Limited
YWTP	Yarwun Water Treatment Plant

2015 Price Monitoring Investigation

Gladstone Area Water Board

1 Introduction

The Treasurer and Minister for Trade has referred GAWB to the Authority for a price monitoring investigation for the 2016–2020 regulatory period.

1.1 Overview

This price review is the fourth review of GAWB's pricing practices conducted by the Authority.

GAWB supports the role of the Authority to independently review GAWB's declared monopoly business activities. GAWB agrees that the periodic independent and transparent assessment of its operations is of benefit to all its stakeholders.

As an essential service provider, GAWB is obliged to ensure that it delivers water supply services that are safe, secure, reliable and appropriately priced. Given its unique customer mix, GAWB is conscious of the consequences of service shortfalls whilst also being aware of the need to discharge its duties efficiently, given that it is customer charges that fund its operations. Accordingly, GAWB strives to meet the appropriate balance between cost minimisation and the consequences of supply failure.

1.2 Approach to 2015 price review

This price review differs from previous investigations, as it is a 'price monitoring' investigation. Previous price reviews were investigations about GAWB's pricing practices. A price monitoring investigation is understood to involve a more focussed and efficient pricing review by the regulator.

The Referral Notice from the Treasurer and Minister for Trade to the Authority for it to conduct a price monitoring investigation of GAWB for the 2016–2020 period requires:

- the Authority to consider the specific matters set out in paragraphs 2(a)–(g) of the Referral Notice;
- the Authority to conduct an open consultation process with all relevant parties;
- GAWB to provide a submission in respect of its pricing practices by 30 September 2014 (this submission);
- the Authority to provide a draft report by 28 February 2015; and
- the Authority to provide a final report by 31 May 2015.

This submission sets out GAWB's plans in relation to each of the matters the Authority is to investigate as set out in paragraphs 2(a)–(g) of the Referral Notice. Appendix A lists these specific matters and includes references to the sections of this submission in which GAWB's plans are set out.

GAWB will also provide the Authority with a pricing model (which will not be publicly released for reasons of customer confidentiality).

GAWB's pricing practices for the 2016–2020 regulatory period will result in an average real price reduction of 2% from 1 July 2015. This means that GAWB's average tariff will be lower in real terms in 2020 than it was in 2011.

1.2.1 Materiality

In setting the terms of reference for the Authority's review of GAWB's monopoly business activities, the Treasurer and Minister for Trade made specific reference in the Referral Notice that the Authority should have regard to capital and operating expenditure (in paragraphs 2(f) and 2(g), respectively) that is likely to have a material impact on price.

Recognising this efficiency objective, GAWB has sought to agree an approach to materiality with the Authority. The approach agreed between the Authority and GAWB is that a change in a customer's price of more than 1% is considered material.

In essence this means that where expenditure (whether operational expenditure or capital expenditure) has an impact on any customer's price of more than 1%, then it will be subject to review by the Authority as part of this price monitoring investigation. The corollary of this is that if an expenditure has only a minor or inconsequential impact (1% or less impact on any customer's price), then it will not be reviewed by the Authority.

It is on the basis of this agreed approach (and the desire for an efficient price review) that GAWB has prepared its submissions.

1.3 Commercial framework

The Gladstone region is an internationally significant industrial and export hub that makes a substantial contribution to the Queensland and Australian economies. The water service that GAWB provides to this region is an essential component to its ongoing economic and social prosperity.

GAWB's customer base is unique. Industrial and power generation demand represents approximately 80% of the total water supplied. GAWB understands that any interruption to supply has the potential to disrupt the operation of these customers' multi-billion dollar facilities, which could result in the loss of substantial revenue to them. Whilst security of supply to such commercially sophisticated customers is critical, value for money is equally important. GAWB seeks to facilitate the appropriate balance between these competing objectives through the medium of its contractual and commercial frameworks. It is through these frameworks that GAWB aims to deliver the optimal allocation of risk and price for the services it provides to its customers.

GAWB's commercial framework has been developed cognisant of GAWB's economic regulatory oversight, customer requirements for a highly secure and reliable water supply and the need to promote sustainability of an essential natural resource. Key elements of GAWB's commercial framework include:

- pricing in accordance with the pricing principles previously recommended by the Authority;
- the ability for customers to trade water reservations (including MDQ reservations);
- participation by customers in a process, when faced with an augmentation, that will provide for the optimal augmentation option being chosen after considering possible alternatives including demand management strategies; and
- promotion of equity amongst existing and future customers.

1.3.1 GAWB's role

A key objective for GAWB is to ensure that the demand requirements of existing and future customers can be met by supplying water that is secure, reliable, meets quality requirements and is appropriately priced.

1.3.2 Contingent Supply Strategy

A key component of GAWB's commercial framework is the CSS. The CSS evolved out of GAWB's response to the critical water supply issues that arose during the 1996–2003 drought. The CSS provides GAWB with the strategic mechanism to efficiently respond to either emerging demand or supply shortages (including shortages caused by drought), through investigating alternative supply options and undertaking only that work that is necessary to reach and maintain the desired state of preparedness.

The CSS is discussed in more detail in Sections 4.5.2, 6.3.5 and 10, and in Appendix C.

1.4 Customer service standards

1.4.1 Level of service

GAWB supplies bulk raw and potable water to major industrial customers and bulk potable water to GRC. GAWB's customer base is unique due to its concentration of a relatively small number of large industrial customers and GRC.

GAWB aims to ensure that the service it provides is aligned with the needs of its customers. This alignment requires an informed allocation of the risks inherent in the water supply and an equitable distribution of the costs related to the provision of GAWB's water service to customers.

GAWB understands its role in ensuring that customers are provided with sufficient data so that they are able to make informed decisions on risk allocation and make the elections that they are best placed to make (to the extent that is possible in a system that leverages the value of common use infrastructure). As an example, customers in one pricing zone may form the view that their own capital investment to increase water storage on their premises is preferable to investment by GAWB in a reservoir to mitigate network risk or alternatively they may form the view that no investment is required at all as the assessed risk is acceptable to them, thereby facilitating their informed and transparent acceptance of risk and price.

GAWB periodically consults with customers in relation to the risks of supply interruption and their individual circumstances. A key objective of this consultation is for customers to understand the nature of the risks and the mitigation actions that GAWB thinks prudent. Customers need to make an assessment of the appropriate balance between risks and costs in light of their own circumstances.

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2 Indicative prices

This section sets out GAWB's indicative prices for the 2016–2020 period. Due to the uncertainty surrounding WACC, these prices are indicative and will be updated once GAWB has had the opportunity to consider the Authority's published parameters for GAWB's benchmark WACC and again once the final inputs for WACC are known immediately before the introduction of new prices in July 2015.

In the 2016–2020 period, GAWB's prices are expected to be, on average, approximately 2% lower in real terms than current prices.

2.1 Introduction

This section sets out indicative prices for the 2016–2020 regulatory period. Prices are labelled 'indicative' because GAWB will update prices based on:

- GAWB's input to the Authority's parameters for GAWB's benchmark WACC (once published);
- the outcomes of this price monitoring investigation;
- changes to contracted demand before 1 July 2015; and
- financial market parameters at the time prices are struck (as required by the Authority's current recommendation regarding calculation of GAWB's allowed return on investment).

GAWB's forecast expenditure (detailed in this submission) would result in prices that are on average 2% lower than current prices.[17] That is, based on GAWB's forecast expenditure, GAWB's average price would be lower in real terms in 2020 than it was in 2011.

Figure 3 shows GAWB's indicative prices for representative zones over a 10-year period.

GAWB's water prices are cost reflective – the actual costs incurred in delivering water services to customers are transparently reflected in its prices.

The indicative 2016 price for raw water in the Awoonga pricing zone is some 11% lower than the current price in real terms. In general, GAWB's prices will decrease in real terms in raw water pricing zones.

GAWB expects prices to increase slightly in real terms in some potable water zones. In these zones, the effect of a decreasing cost of capital is less than the aggregate cost impact of:

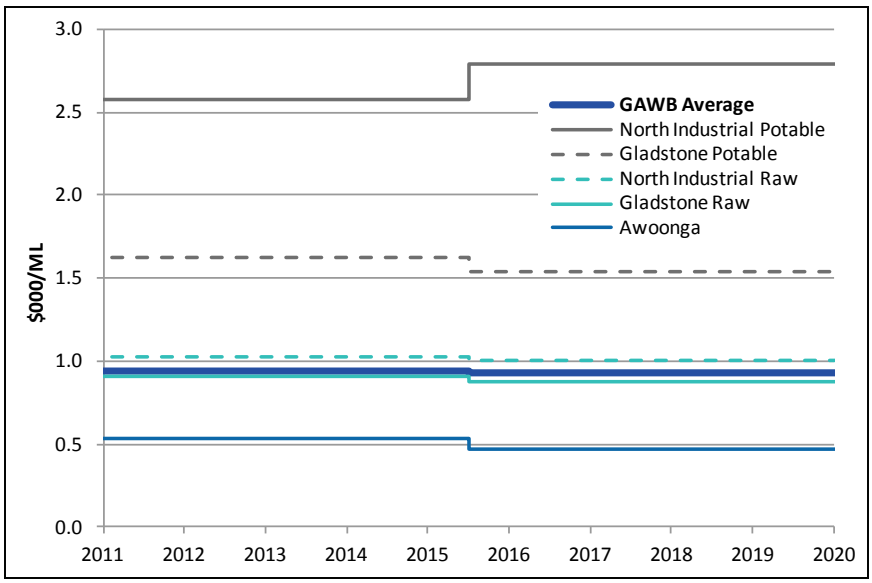
- specific capital projects required to maintain water quality and replace end-of-life assets;
- a more realistic estimate of prudent and efficient operational expenditure; and
- significantly higher electricity costs than were forecast in 2010.

Overall, most customers will see a real price decrease. Customer outcomes range from a decrease of 23% to an increase of 4%, before considering effects of changing to an MDQ-based delivery price.[18]

[17] To make a valid comparison between regulatory periods, the average price excludes the Curtis Island pricing zone, which was not contemplated at the 2010 price review.

[18] Outcomes exclude the Curtis Island customers, for which no 2010 price review comparison price is available.

Figure 3: GAWB actual and indicative prices in real terms ($2016)



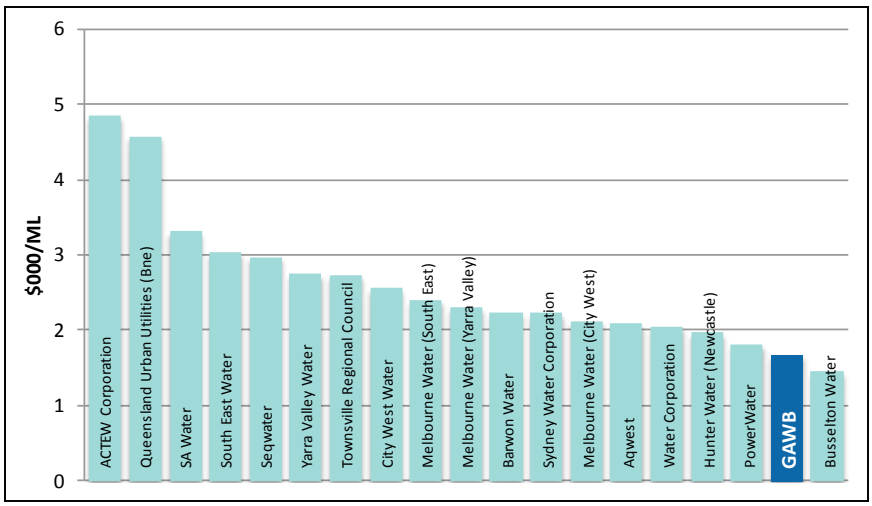
2.2 Comparison of indicative prices to other utilities

Simplistic comparisons of GAWB's prices to other service providers can be misleading. Prices are reflective of the cost of the specific service in a particular region, which is a function of a business's particular scale, customer density, topography and water sources (affecting storage costs, bulk water transport and treatment costs). That said, price is acknowledged as a key basis for public comparison between water service providers and can represent a valid indicator of efficiency.

GAWB engaged Synergies Economic Consulting,[19] to provide data illustrating potable water prices of a representative Australia-wide selection of other regulated water service providers, and GAWB has compared these prices to the weighted average potable delivery price charged to GRC. GAWB's 2015 weighted average price of $1,943/ML is towards the lower end of the water service providers measured in the analysis.

[19] Synergies, *Australian Water Prices: Gladstone Area Water Board*, August 2014.

Figure 4: GAWB 2015 weighted average potable water price compared to other regulated businesses



In summary, GAWB's prices are currently low compared to peers and will remain low for the next five years.

2.3 Comparison of indicative prices to current prices

GAWB's indicative 2016–2020 prices are set out in Table 3. For ease of comparison with existing prices, delivery prices are expressed in $/ML of annual volume reservation. As discussed in section 8.2, GAWB intends to transition to MDQ-based delivery charges from 1 July 2015.

Table 3: Indicative 2016 water prices by pricing zone

Pricing zone	Final 2011 prices $/ML	2011 Prices indexed to 2016 $/ML	Indicative 2016 prices $/ML	Difference $/ML
Awoonga	469	532	471	–11%
Boyne Raw*	1,017	1,152	1,187	3%
Central/Mt Miller Pipeline/Hanson Rd Pipeline	906	1,026	1,000	–3%
QAL	850	962	937	–3%
Fisherman's Landing Raw	1,734	1,964	1,520	–23%
Gladstone City*	1,437	1,627	1,662	2%
GWTP to South Gladstone*	1,434	1,624	1,692	4%
Calliope*	2,101	2,380	2,195	–8%
South Gladstone to Toolooa	1,706	1,933	1,933	0%
Boyne Potable*	1,998	2,263	2,262	0%
Benaraby*	2,692	3,049	3,474	14%
North Industrial Potable	2,359	2,672	2,790	4%
Fisherman's Landing Potable*	6.768	7,666	6,844	–11%
Boat Creek to East End*	7,379	8,358	8,891	6%

* GRC has off-takes in each of these eight pricing zones. The average indicative 2016 price for water supplied to GRC is approximately 3% higher than the current average price.

As discussed above, the indicative 2016 price for raw water in the Awoonga pricing zone is lower than the 2011 price by approximately 11% in real terms. This is largely the result of an expected reduction in the required rate of return on investment and higher forecast demand.

3 Operating expenditure

3.1 Introduction

The purpose of this section is to outline GAWB's operating expenditure for the 2016–2020 regulatory period and forecast operating expenditure for the remainder of the 20-year planning period.

3.2 Approach to forecasting operating expenditure.

Since the 2010 Price Review, GAWB has transitioned to function-based expenditure reporting rather than the previously utilised method of aggregating costs by the relevant cost category. This function-based reporting approach is consistent with contemporary accounting practice and provides for greater transparency and understanding of the costs necessary to perform GAWB's key functions.

The development and transition to functional reporting has been led by GAWB's Board and management team who have sought specialist advice from PricewaterhouseCoopers (PwC) on its functional reporting approach and proposed methodology. PwC's review concluded that GAWB's functional definitions were reasonable, appropriate and reflective of business activities.[20] A copy of the advice from PwC is included at Appendix H.

The functions and associated definitions adopted by GAWB are included in Table 4.

Table 4: GAWB functions and their definition

GAWB function	Definition
Strategy & asset creation	The strategy and asset creation function incorporates those activities necessary to meet strategic business and asset creation positioning and governance requirements. Activities include: • Board and CEO • Strategic planning • Economic regulation • New customer/business development • Pre-feasibility, scoping and planning of capital expenditure • Non-capital creation and acquisition costs of capital expenditure This function includes those strategic activities that would not ordinarily be considered day-to-day activities. For example, development of strategic documents (e.g. strategic water plans) and development of GAWB's submissions towards Resource Operations Plan (ROP) renewals are considered strategic in nature and therefore part of the Strategic function. Monitoring and reporting on ROP conditions are operational in nature and therefore part of the Operations function. In relation to asset creation, the operating expenditure for this function includes those initial costs necessary to determine whether the asset creation meets the needs or strategic positioning of the business.

[20] PwC, *Functional Cost Allocation Review: Final Report*, August 2014, page i.

GAWB function	Definition
Asset life cycle management	The asset life cycle management function entails activities required to manage, maintain and hold GAWB's existing assets. Activities include: • Maintenance planning and execution • Condition assessments • Land management • Easement maintenance • Recreation area management • Maintenance of corporate assets This function covers the asset life cycle maintenance for all of GAWB's assets including applicable holding costs such as insurance, local government rates, land tenure and asset leasing. Recreation area management costs are necessary to maintain GAWB's assets and are therefore included within this function.
Operations	The operations function entails those activities and inputs required to provide a desired product. Activities include: • Storage • Delivery • Treatment • Hatchery (supporting storage) Activities in this function are considered day-to-day expenditure for operating and monitoring.
Corporate services	Corporate services activities are primarily to support the functions and operations of the other activities and are costs that cannot be allocated to the other functions including: • Finance • Procurement • Human Resources • Information Communication & Technology • Legal • Administration/reception This function captures costs that support the identified business functions on a day-to-day basis and cannot be reasonably aggregated or allocated to other functions.

GAWB's operating expenditure forecasts for this price review have been prepared on this functional basis.

3.3 Conversion of forecasts

Given the change in forecasting methodology, it was necessary for GAWB to convert the Authority's 2010 forecasts (QCA forecasts) of GAWB's operating expenditure for 2011–2015 (the current regulatory period), which were allowed to be recovered in customer prices from 1 July 2010 to align with this functional reporting basis.

GAWB has also undertaken a detailed process to convert its actual operating expenditure for the first four years of the current regulatory period to align with GAWB's functional reporting basis. To ensure rigour and transparency in the conversion, PwC were engaged to provide an external quality assurance on the translation. PwC considered various aspects of the conversion, particularly applying integrity principles of completeness, accuracy, consistency and transparency.[21]

The quality assurance process conducted by PwC noted that the translation rules were accurately and consistently applied. In their report, PwC state:

> To the extent that we were able to validate calculations against source documentation, the translation rules applied to the 2010 QCA Price Review Forecast and subsequent yearly costs baselines, appear to have been accurately and consistently applied in accordance with the proposed functional allocation methodology. Methodology papers, including key assumptions, and other documentation reviewed clearly outlined the cost allocation process undertaken at GAWB and respective reconciliation to source data.[22]

[21] PwC, *Functional Cost Allocation Review: Final Report*, August 2014, page 3.

[22] PwC , *Functional Cost Allocation Review: Final Report*, August 2014, page 4.

Table 5 provides a summary of the conversion of the QCA forecasts to GAWB's functional reporting basis.

Table 5: Conversion of QCA forecasts to GAWB's functional reporting basis

	2011 $000	2012 $000	2013 $000	2014 $000	2015 $000
Total operating expenditure in 2010 Final Report [1]	15,052	14,797	14,789	16,189	16,856
Cost pass through of increase in QCA regulatory service fee [2]	268	288	308	330	353
Total QCA forecast	**15,320**	**15,085**	**15,097**	**16,519**	**17,209**
Represented by GAWB functions:					
• Operations	4,870	4,929	5,077	5,307	5,618
• Asset life cycle management	5,737	5,406	5,302	5,989	6,047
• Strategy and asset creation	3,070	3,051	3,023	3,502	3,660
• Corporate services	1,643	1,699	1,695	1,721	1,884
Total QCA forecast	**15,320**	**15,085**	**15,097**	**16,519**	**17,209**

[1] Queensland Competition Authority, Final Report – Gladstone Area Water Board: Investigation of Pricing Principles
[2] Gladstone Area Water Board letter to the Authority, 21 September 2010

Table 6 provides a summary of the conversion of GAWB's actual operating expenditure for the first four years of the current regulatory period to function-based reporting. (Special projects expenditure includes expenditure relating to the Curtis Island infrastructure project. This expenditure forms part of the separate confidential submission to the Authority.)

Table 6: Conversion of actual operating expenditure to GAWB's functional reporting basis

	2011 $000	2012 $000	2013 $000	2014 $000
Total expenditure per GAWB Financial Report	28,063	31,698	34,476	38,180
Adjust for staff MV contributions reported as other income in GAWB Financial Report	(45)	(60)	(74)	(86)
Less expenditure excluded from the regulatory regime [1]	(7,570)	(11,813)	(13,816)	(15,727)
Less expenditure on special projects [2]	(4,491)	(1,091)	(1,160)	(830)
Total GAWB operating expenditure	**15,957**	**18,734**	**19,426**	**21,537**
Represented by GAWB functions:				
• Operations	5,021	5,706	6,580	6,918
• Asset life cycle management	6,267	7,639	7,445	9,126
• Strategy and asset creation	2,762	3,641	3,672	3,793
• Corporate services	1,907	1,748	1,729	1,700
Total GAWB operating expenditure	**15,957**	**18,734**	**19,426**	**21,537**

[1] Includes expenditure items such as depreciation, amortisation and loss on sale of assets.
[2] Special project expenditure includes Curtis Island expenditure which will form part of a separate confidential submission to the Authority.

During the current regulatory period (2011–2015), GAWB's operating expenditure has been higher than the level of operating expenditure that the Authority allowed GAWB to recover in customer prices.

Although the regulatory mechanism does not allow the recovery of such additional operating expenditure from customers, GAWB has incurred these costs in order to ensure that the service that it provides to customers is not negatively affected. GAWB remains of the view that the quantum of operating expenditure assessed as efficient by the Authority at the 2010 Price Review was insufficient to ensure that all regulatory, customer and asset obligations were met, to the standards required of a reasonable bulk water supplier.

At the 2010 Price Review, on the basis of advice from consultants the Authority reduced GAWB's operating expenditure for forecast 'efficiencies gains'. In GAWB's view the Authority's consultants suffer from information asymmetry that arises from limited exposure to the business and the lack of accountability in relation to outcomes. In its response to the Draft Report issued by the Authority in 2010, GAWB was able to identify numerous errors or inadequacies in the reports of the Authority's consultants concerning operating expenditure. Accordingly, GAWB is of the view that the probative basis of these consultants' reports in recommending reductions in the forecast expenditure submitted by GAWB, was unreliable.

3.4 Efficiency of operations

GAWB undertook a number of projects during the current regulatory period in an effort to recruit efficiency savings in its business. These projects included the in-sourcing of easement maintenance expenditure (which provided opportunities for GAWB to realise synergies when undertaking easement maintenance and asset condition assessments).

GAWB has also undertaken a detailed benchmarking review[23] and Operations and Asset life cycle management efficiency review[24] to support its operational expenditure forecasts.

GAWB's actual (2011–2014) and forecast (2015) functional expenditure (excluding expenditure in relation to the Curtis Island pricing zone) to is compared with the QCA forecast for the 2011–2015 period in Table 7 and Figure 5.

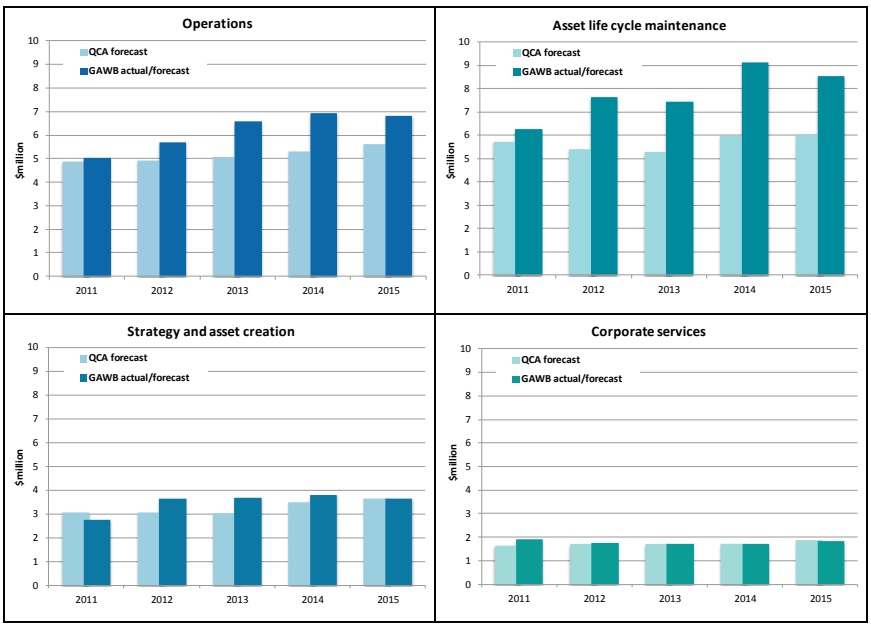
Table 7: Comparison of GAWB operating expenditure to QCA forecasts

	2011 $000	2012 $000	2013 $000	2014 $000	2015 $000
Operations function					
Actual/forecast expenditure (GAWB)	5,021	5,706	6,580	6,918	6,838
QCA forecast (QCA)	4,870	4,929	5,077	5,307	5,618
Variance: GAWB greater/(less) than QCA	151	777	1,503	1,611	1,220
Asset life cycle management function					
Actual/forecast expenditure (GAWB)	6,267	7,639	7,445	9,126	8,566
QCA forecast (QCA)	5,737	5,406	5,302	5,989	6,047
Variance: GAWB greater/(less) than QCA	530	2,233	2,143	3,137	2,519
Strategy & asset creation function					
Actual/forecast expenditure (GAWB)	2,762	3,641	3,672	3,793	3,661
QCA forecast (QCA)	3,070	3,051	3,023	3,502	3,660
Variance: GAWB greater/(less) than QCA	(308)	590	649	291	1
Corporate services function					
Actual/forecast expenditure (GAWB)	1,907	1,748	1,729	1,700	1,832
QCA forecast (QCA)	1,643	1,699	1,695	1,721	1,884
Variance: GAWB greater/(less) than QCA	264	49	34	(21)	(52)

[23] MHC, *Gladstone Area Water Board: Operational Benchmarking*, July 2014.

[24] GHD, *Review of Operations and Asset Life Cycle Management Expenditure for GAWB's 2015 Price Review*, September 2014.

Figure 5: Comparison of GAWB operating expenditure to QCA forecasts



3.5 Operational expenditure benchmarking

To assist in demonstrating the efficiency, cost-effectiveness and productivity of GAWB's operating expenditure, GAWB engaged Marchment Hill Consulting (MHC) to undertake an operational expenditure benchmarking review. A copy of MHC's report is included at Appendix E.

The report provides a high level comparison between GAWB and selected peer organisations (i.e. the 'whole of business' level for operational expenditure, capital expenditure, full time equivalent staff and revenue) based on efficiency, productivity and cost ratios. Operational expenditure was also compared at a functional level using MHC's 'fingerprinting' methodology to allow estimated functional cost structure breakdowns for the peers compared to actual operating cost data for GAWB.

The key outcomes from the benchmarking review were:

- GAWB's efficiency ratios are consistently superior to the peer group, with GAWB being the only organisation to be better than the average on all five measures,[25]
- GAWB's productivity ratio performances are similar to those of its most similar peer group members and considerably better than the peer group average,[26] and
- GAWB performed better than average on all four cost ratio measures.[27]

[25] MHC, *Gladstone Area Water Board: Operational Benchmarking*, July 2014, page 6.

[26] MHC, *Gladstone Area Water Board: Operational Benchmarking*, July 2014, page 8.

[27] MHC, *Gladstone Area Water Board: Operational Benchmarking*, July 2014, page 7.

3.6 Materiality

The Referral Notice for GAWB's price monitoring investigation provides for the following in relation to operating expenditure:

2(g) for operating expenditure to be included in the forecast revenue, the Authority may investigate the expenditure in any function where GAWB's forecast expenditure in that function exceeds the level allowed in the Authority's 2010 pricing practices investigation by an amount that would give rise to a material increase in price.

At the 2010 Price Review, the Authority reviewed GAWB's operating expenditure and determined the quantum of operating expenditure that GAWB was allowed to recover in customer prices for the 2011–2015 period. To accord with the Referral Notice, GAWB has utilised its operating expenditure forecasts for 2015 (Base Year) to develop its operating expenditure forecasts for 2016–2020. This approach allows a direct comparison between GAWB's Base Year and the operating expenditure previously allowed by the Authority to be recovered in customer prices.

Table 8 provides a comparison between GAWB's Base Year (excluding expenditure in relation to the Curtis Island pricing zone) and those forecasts for 2015 allowed by the Authority in 2010 to be recovered in customer prices.

Table 8: GAWB Base Year comparison

	GAWB forecast $000	QCA forecast $000	GAWB greater/(less) than QCA $000
Operations	6,838	5,618	1,220
Asset life cycle management	8,566	6,047	2,519
Strategy and asset creation	3,661	3,660	1
Corporate services	1,832	1,884	(52)

3.7 Base Year comparisons

The Base Year comparison provided in Table 8 highlights that GAWB has had overall material increases in operating expenditure in the functions of Operations and Asset life cycle management. Operating expenditure for the functions of Strategy and asset creation and Corporate services do not exceed the expenditure forecasts previously allowed by the Authority to be recovered in customer prices (and which included the recruitment of various efficiency savings mandated in the QCA forecasts) by an amount that would give rise to a material increase in price.

The following sections will detail the factors giving rise to material increases in operating expenditure forecasts for both the Operations and Asset life cycle management functions.

Information in relation to expenditure for the Strategy and asset creation and Corporate services functions (which is in line with that assessed by the Authority as efficient at the 2010 Price Review) in section 3.7.2.

3.7.1 Material increase in operating expenditure

Operations

As noted above, GAWB's Operations function incorporates those activities and inputs required to provide a desired product. Activities in this function are considered day-to-day expenditure for operating and monitoring GAWB's network. Activities include storage, delivery, treatment, and hatchery (supporting storage).

Table 9 details operating expenditure in the Operations function during the current regulatory period.

Table 9: Operations function expenditure 2011–2015

	2011 $000	2012 $000	2013 $000	2014 $000	2015 $000
Actual/forecast expenditure (GAWB)	5,021	5,706	6,580	6,918	6,838
QCA forecast (QCA)	4,870	4,929	5,077	5,307	5,618
Variance: GAWB greater/(less) than QCA	151	777	1,503	1,611	1,220

Operations expenditure has increased steadily during the current regulatory period. The primary causes of this increase are:

- the need for additional resources to allow GAWB to properly discharge its duties; and
- significant increases in electricity costs.

These increases have been partly offset by efficiencies gained, particularly in relation to water treatment activities.

In 2009, GAWB in-sourced the operations of the GWTP which was up until that time undertaken by GRC. At the time of in-sourcing, the preferred optimal method for the operation (and staffing) of the GWTP was anticipated to be a 16-hour operation, 5 days per week supported by extensive use of the SCADA network (which was in the process of being rolled out). GAWB prepared its operating expenditure forecasts for the current regulatory period on that basis. The Authority at the 2010 Price Review sought to achieve further efficiencies from GAWB's forecasts through the use of SCADA technology by removing the cost of one water treatment plant operator from the operating expenditure allowed to be recovered in customer prices.

Subsequent to the 2010 Price Review, it became apparent that 16-hour, 5 days per week operation of the GWTP was not achievable without attendant risk that was deemed by GAWB as unacceptable. While GAWB continues to develop its use of SCADA throughout the network, it has not yielded the efficiency savings that the Authority predicted. The current operation of GWTP requires 24-hour activity, 7 days per week in order to manage:

- unreliable plant within the network, e.g. pipeline, communications and network failures;
- single-line processes that do not have redundancy within the plant or process in the event of failure, e.g. Yarwun Water Treatment Plant (YWTP); and
- uninterrupted 24-hour supply necessary for GAWB's customers.

History has shown that the above issues can create events multiple times over in any 24-hour period and require manual intervention. To reduce the potential of an interruption of supply to customers, the treatment plants and distribution network need to be monitored continuously.

To achieve a higher level of unattended operation will require substantial capital investment throughout the network. GAWB is committed to greater use of automation and will continue to review its potential but will not implement it until such time as it believes that the risk of failure of supply to customers is not unacceptably increased.

The internal resourcing forecast for the water treatment plant staff in the current regulatory period was insufficient to meet these operational requirements and resulted in an increase in staff overtime and the inability of staff to take annual leave without utilisation of external resourcing (at a much higher cost than internal resourcing). In response, GAWB reviewed its shift working arrangements and internal staffing requirements to ensure that optimal productivity and efficiency could be achieved at the GWTP. An outcome of this review was that additional internal GWTP resources were recruited.

In addition to the GWTP roles, GAWB engaged an Automation Technician to support the automation and control assets, a Technical Assistant for the water quality and environmental programs in addition to an Operations Administration role to provide executive support and secretarial services to the Operations and Maintenance Manager.

Electricity costs

GAWB has seen considerable increases in its electricity expenditure over the current regulatory period. The increases are primarily attributable to the prevailing market forces and the impact of the Carbon Tax. GAWB absorbed the cost of the Carbon Tax during the current regulatory period.

While GAWB is a price-taker in relation to the cost of electricity, it continues to review and refine its operational protocols to ensure electricity usage is efficient. The largest component of GAWB's electricity cost is the cost of running the pumps at the Awoonga Dam Pump Station. GAWB reviews its pumping regime on an ongoing basis to ensure efficiencies are realised – however the over-riding focus is security of supply. The pumping regime is also significantly influenced by the maintenance activities being undertaken throughout the water distribution network and the need to maintain an appropriate level of in-system storage so that reliability of water supply to customers is not impacted. GAWB does not have a second water source and therefore must pump water from Awoonga Dam every 24 hours to replenish delivery network storage.[28]

Water treatment activities

GAWB's Drinking Water Quality Management Plan (DWQMP) was approved on 29 February 2012 in compliance with new regulatory requirements. Through the development and implementation of its DWQMP, GAWB has driven continued performance improvements through the network, particularly in:

- Connection of online water quality instrumentation at Awoonga Dam which allows operators to respond quickly to changing water quality, especially in an event/emergency;
- Initial investigations to improve flow rate control through the GWTP which has led to the formulation of a major pump upgrade project which will allow much better control over plant and network flows, improving both plant water quality and power consumption;
- Pressure monitoring implemented throughout the network, decreasing reaction time to breaks , thus decreasing network down time and minimising water loss;
- Streamlining of treatment chemical procurement in standardised scopes and specifications;
- Generation of routine operational and maintenance tasks through GAWB's asset maintenance system has resulted in efficiencies in resourcing and the execution of tasks; and
- Improvements in emergency planning and scenario testing.

The regulator of the DWQMP refers other utilities to GAWB as an example of good practice.

Asset life cycle management

The Asset life cycle management (ALCM) function incorporates activities required to manage, maintain and hold GAWB's existing assets. Activities include:

- Maintenance planning and execution;
- Condition assessments;
- Land management;
- Easement maintenance;
- Recreation area management; and
- Maintenance of corporate assets.

[28] GAWB, *Strategic Water Plan*, November 2013, page 67.

Operating expenditure in the ALCM function for the current regulatory period is set out in Table 10.

Table 10: Asset life cycle management function expenditure 2011–2015

	2011 $000	2012 $000	2013 $000	2014 $000	2015 $000
Actual/forecast expenditure (GAWB)	6,267	7,639	7,445	9,126	8,566
QCA forecast (QCA)	5,737	5,406	5,302	5,989	6,047
Variance: GAWB greater/(less) than QCA	530	2,233	2,143	3,137	2,519

Over the current regulatory period, GAWB has incurred costs in relation to its Asset life cycle management function that are higher than the expenditure levels allowed by the Authority in 2010 to be recovered in customer prices. The additional expenditure is reflective of the further development of GAWB's asset management system and the need to ensure that supply reliability for customers is maintained.

Table 11 provides details of the primary expenditure categories within the ALCM function for the Base Year. Adjustments have been made to the QCA forecast allocations to reflect GAWB's in-sourcing of activities which had previously been forecast to be completed by external maintenance contractors.

Table 11: Primary categories of Base Year ALCM expenditure

	GAWB forecast $000	QCA forecast $000	GAWB greater/(less) than QCA $000
Staffing costs	3,769	2,934	835
Maintenance	2,174	1,306	868
Insurance	736	744	(8)
Motor vehicle	750	393	357
Rates	221	413	(192)
Professional services	228	42	186
Other expenditure	688	215	473
	8,566	**6,047**	**2,519**

The focus of the ALCM function has evolved significantly since the time of the 2010 Price Review. Previously, GAWB outsourced the majority of maintenance functions to external contractors and had limited asset condition information on its operational assets.

During the current regulatory period, GAWB has significantly progressed its internal maintenance capabilities and capacity to deliver optimal whole-of-life infrastructure decisions. GAWB now has better knowledge of its assets through implementing appropriate asset management practices. Key initiatives implemented were:

- in-sourcing of electrical and mechanical maintenance crews (March 2010);
- in-sourcing of easement maintenance activities that were previously outsourced (September 2011); and
- implementation of GAWB's AMS (June 2013).

A major benefit of maintenance in-sourcing is greater asset information capture and assessment. This critical information capture allows for more effective input into the development of budgets and the capital renewal program. GAWB's in-sourcing of maintenance activities was highly beneficial during the peak external contractor demand period that was experienced in connection with the development of the liquefied natural gas (LNG) plants on Curtis Island. Had maintenance capabilities not existed in-house, GAWB's continuity and reliability of supply may have been jeopardised through long contractor response times.

In-sourcing of maintenance activities has had a related impact on associated expenditure such as leasing of motor vehicles, other labour and information technology costs, ancillary tools and equipment and engagement of professional consultants. While GAWB has achieved significant improvements in its asset management, it is continuing on the journey to better understand its assets and respond to maintenance requirements in an efficient and prudent way.

At the 2010 Price Review, the Authority considered that any ***underspent*** maintenance expenditure over 2011–2015 should be adjusted against prices for the subsequent period.[29] GAWB's actual expenditure on maintenance activities for the period ***exceeds*** the QCA forecast and therefore no clawback of maintenance expenditure included in customer prices is necessary.

3.7.2 Functions where there is no material increase in operating expenditure

Strategy and asset creation

The Strategy and asset creation function incorporates those activities necessary to meet strategic business and asset creation, positioning and governance requirements. This function includes those strategic activities that would not ordinarily be considered day-to-day activities. Activities include Board and CEO, strategic planning, economic regulation, new customer/ business development, pre-feasibility, scoping and planning of capital expenditure, and non-capital creation and acquisition costs of expenditure.

Operating expenditure in the Strategy and asset creation function for the current regulatory period is set out in Table 12.

Table 12: Strategy and asset creation function expenditure 2011–2015

	2011 $000	2012 $000	2013 $000	2014 $000	2015 $000
Actual/forecast expenditure (GAWB)	2,762	3,641	3,672	3,793	3,661
QCA forecast (QCA)	3,070	3,051	3,023	3,502	3,660
Variance: GAWB greater/(less) than QCA	(308)	590	649	291	1

GAWB's Base Year expenditure for this function is in line with that assessed by the Authority as efficient at the 2010 Price Review. A significant activity that occurred during the current regulatory period was the review and update to GAWB's Strategic Water Plan (SWP) during the 2012–2013 financial years. While the previous SWP focussed upon ensuring the security of GAWB's water supply, the 2013 SWP also looked at how GAWB can best meet the needs of current and future customers and specifically addresses the important inter-related water service issues of demand, security, reliability and price.

The Base Year expenditure for this function is also reflective of the recruitment of operating expenditure efficiency gains that were imposed by the Authority at the 2010 Price Review.

Corporate services

The Corporate services function captures costs relating to the day-to-day activities that support all of the identified business functions.

Operating expenditure in the Corporate services function for the current regulatory period is set out in Table 13.

[29] QCA, *Final Report – Gladstone Area Water Board: Investigation of Pricing Practices*, June 2010, page 154.

Table 13: Corporate services function expenditure 2011–2015

	2011 $000	2012 $000	2013 $000	2014 $000	2015 $000
Actual/forecast expenditure (GAWB)	1,907	1,748	1,729	1,700	1,832
QCA forecast (QCA)	1,643	1,699	1,695	1,721	1,884
Variance: GAWB greater/(less) than QCA	264	49	34	(21)	(52)

GAWB's Base Year expenditure for this function is in line with that assessed by the Authority as efficient at the 2010 Price Review. There have been no significant changes in its day-to-day operations over the current regulatory period. GAWB continues to review and refine its processes to ensure that efficiencies are gained where possible. The Base Year expenditure for this function is also reflective of the recruitment of operating expenditure efficiency gains that were imposed by the Authority at the 2010 Price Review.

3.8 Forecasts for 2016–2020

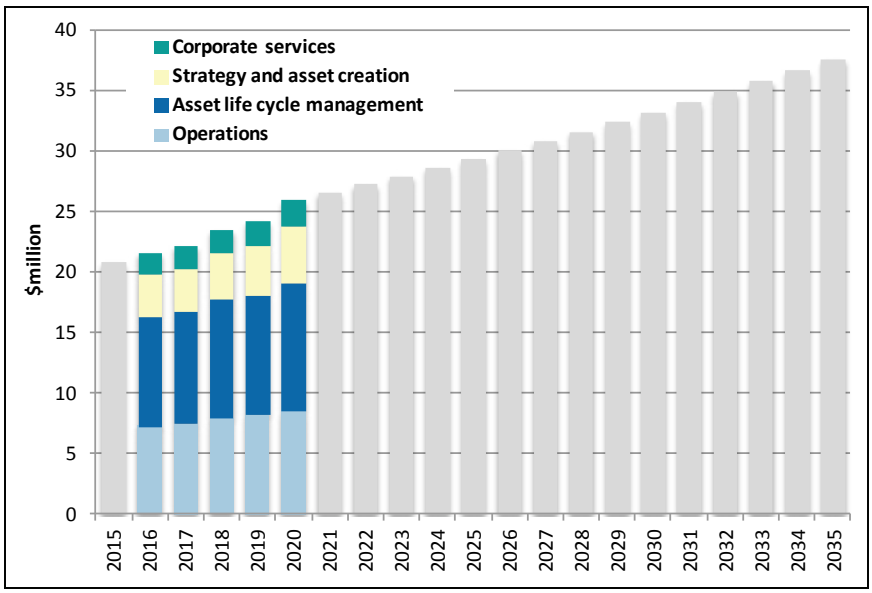
3.8.1 Forecast operating expenditure forecasts by function

GAWB has forecast the following operating expenditure by function for the 2016–2020 regulatory period (excluding expenditure in relation to the Curtis Island pricing zone that has been provided to the Authority in a separate confidential submission).

Table 14: GAWB operating expenditure for 2016–2020

	2016 $000	2017 $000	2018 $000	2019 $000	2020 $000
Operations	7,278	7,498	7,940	8,232	8,570
Asset life cycle management	9,065	9,237	9,948	9,863	10,572
Strategy and asset creation	3,506	3,572	3,689	4,131	4,758
Corporate services	1,854	1,924	1,958	2,044	2,109
Total operating expenditure	21,703	22,231	23,535	24,270	26,009

Figure 6: Total operating expenditure by function 2016–2020



3.8.2 Preparation of forecasts for the 2016–2020 period

GAWB has maintained the approach that was developed for the 2010 Price Review of compiling detailed expenditure forecasts to support its submissions on operating expenditure for each of its functions.

For the 2016–2020 regulatory period, GAWB has undertaken an in-depth analysis, including:

- a specific forecast for every line of the general ledger accounts, taking into account contracts for supply of services;
- linking expenditure forecasts to known future regulatory obligations (periodic regulatory reviews, strategic water plan updates, dam safety requirements, preventative maintenance schedules etc.); and
- adopting cost escalation factors relevant to the particular cost item (e.g. electricity network costs based on regulated price determinations rather than CPI forecasts).

This approach is consistent with GAWB's approach for the current regulatory period.

3.8.3 Escalation of operating costs

For the 2010 Price Review, GAWB submitted escalation factors for the 2011–2015 regulatory period based on three-year historical averages over a variety of expenditure categories.[30] The Authority considered that historical averages did not provide a reliable indication of cost escalation for operations, maintenance and chemicals costs as market conditions may markedly differ to those in the forecast period.[31] However, the Authority did allow GAWB to apply the following specific escalation factors:

- staffing costs – increasing at 5% per year, incorporating a market movement of 4% a year and a performance related movement of 1% per year;
- insurance – increasing by 5% a year for three years then increasing at CPI thereafter;
- professional engineering services – increasing by 4.63% per year;
- electricity – increasing by 8% per year; and
- council costs – increasing by 5.3% per year.

For the 2016–2020 regulatory period, GAWB has applied forward-looking escalation rates, where they are available. Alternatively, historical averages (mirroring those approved by the Authority in the 2010 Price Review) or CPI have been applied. Historical indexes have only been applied in instances where they provide a better indicator of cost movements (compared to CPI) and forward-looking escalators are not available.

GAWB has adopted an approach which is consistent with the 2010 Price Review for identification and sourcing of escalation rates relating to particular expenditure categories. The cost escalation factors used to forecast operating costs for the 2016–2020 regulatory period are set out in Table 15.

[30] QCA, *Final Report – Gladstone Area Water Board: Investigation of Pricing Practices*, June 2010, page 141.

[31] QCA, *Final Report – Gladstone Area Water Board: Investigation of Pricing Practices*, June 2010, page 142.

Table 15: Operating expenditure cost escalation factors 2016–2020

Expenditure category	Escalation rate	Source
Staffing costs	2016: 3.29% 2017: 3.13% 2018: 3.38% 2019: 3.61% 2020: 3.97%	Forward-looking approach based on Mercer estimate of likely remuneration movements.
Insurance	5% per year	Forward-looking estimate provided by Marsh.
Professional engineering services	3.4%	3 year historical average of Professional, scientific and technical services (All Sectors) (September quarter, 2013).
Electricity	2016: 9.83% 2017: 9.82% 2018: 9.60% 2019: 6.25% 2020: 6.25%	Forward-looking approach based on independent advice from Wedgewood White Limited.
Council costs	2.6% per year	March 2014 Local Government Association's Council Cost Index.
Regulatory fee	5.8%	Based on the current escalator utilised and advised by the Authority.
Operations, maintenance, chemicals and all other expenditure	2.50%	Mid-point of CPI target inflation band. Consistent with GAWB's indicative WACC.

For each year of the 2016–2020 regulatory period operating expenditure forecast, GAWB has utilised the Base Year expenditure value escalated by the relevant escalation factor. For expenditure items that vary year-to-year from the Base Year due to their nature, GAWB has determined a specific forecast for that item. This is relevant for the maintenance, specialist support, consulting services, legal advice, pricing matters, professional engineering services, and Sponsorships and donations expenditure categories.

3.8.4 Operations

The key components of Operations expenditure are staffing costs, electricity and chemicals. Expenditure in the Operations function represents the day-to-day expenditure necessary for operating and monitoring GAWB's storage, delivery, treatment and hatchery (supporting storage) activities.

Forecast expenditure in 2016–2020 for the Operations function is compared with Base Year expenditure in Table 16.

Table 16: Operations operating expenditure 2016–2020

	Base Year 2015 $000	2016 $000	2017 $000	2018 $000	2019 $000	2020 $000
Forecast expenditure	6,838	7,278	7,498	7,940	8,232	8,570
Increase vs previous year ($000)		**440**	**220**	**442**	**292**	**338**
Increase vs previous year (%)		**6%**	**3%**	**6%**	**4%**	**4%**
Key areas of expenditure:						
Staffing costs	2,863	2,970	3,061	3,162	3,272	3,397
Electricity	1,991	2,186	2,401	2,631	2,796	2,971
Chemicals	808	828	849	870	892	914
Water quality monitoring	323	331	339	348	357	366
Professional services	208	285	197	261	218	212
Other expenditure	645	678	651	668	697	710
	6,838	**7,278**	**7,498**	**7,940**	**8,232**	**8,570**

3.8.5 Asset life cycle management

The key components of Asset life cycle management expenditure are staffing costs, maintenance, insurance and motor vehicles.

Forecast expenditure in 2016–2020 for the Asset life cycle management function is compared with Base Year expenditure in Table 17.

Table 17: Asset life cycle management operating expenditure 2016–2020

	Base Year 2015 $000	2016 $000	2017 $000	2018 $000	2019 $000	2020 $000
Forecast expenditure	8,566	9,065	9,237	9,948	9,863	10,572
Increase vs previous year ($000)		**499**	**172**	**711**	**(85)**	**709**
Increase vs previous year (%)		**6%**	**2%**	**8%**	**–1%**	**7%**
Key areas of expenditure:						
Staffing costs	3,769	3,970	4,093	4,229	4,377	4,546
Maintenance	2,174	2,308	2,257	2,790	2,463	2,810
Insurance	736	772	810	850	892	936
Motor vehicles	750	767	786	806	826	847
Rates	221	227	233	239	245	251
Professional services	228	237	315	272	257	364
Other expenditure	688	784	743	762	803	818
	8,566	**9,065**	**9,237**	**9,948**	**9,863**	**10,572**

Table 18 outlines the forecast maintenance for the next regulatory period. While the preventative maintenance schedule makes up a large proportion of the total maintenance expenditure, GAWB has also forecast expenditure required for corrective maintenance. An annual allowance is also included for unplanned maintenance.

Table 18: Maintenance expenditure by major project 2016–2020

	2016 $000	2017 $000	2018 $000	2019 $000	2020 $000
Preventative maintenance					
Awoonga Dam pump station	83	238	141	111	399
Awoonga Dam storage structures & intake towers	60	66	83	70	66
Control systems (software licence & support)	69	70	72	74	76
Reservoir internal & external inspections	291	158	355	177	260
YWTP	313	242	329	254	345
Pump stations	36	58	122	83	40
Recreation area & easement machinery maintenance	112	115	118	120	124
Pipeline condition assessments	82	84	517	530	543
Other	194	214	251	192	181
	1,240	**1,245**	**1,988**	**1,611**	**2,034**
Corrective maintenance					
Pipeline failures and repairs	128	132	135	138	141
On call service providers	59	61	63	64	66
Mechanical and electrical corrective maintenance on dosing systems	50	51	52	54	55
South Trees bridge assessment Stage 2	308	–	–	–	–
YWTP clarifier	53	273	–	–	–
Awoonga Dam concrete repairs	–	–	–	60	–
Other	67	82	129	102	69
	665	**599**	**379**	**418**	**331**
Unplanned maintenance					
Allowance for unplanned maintenance	308	315	323	331	340
Allowance for maintenance required following a flood event (costs not covered by insurance)	95	98	100	103	105
	403	**413**	**423**	**434**	**445**
Total maintenance expenditure	**2,308**	**2,257**	**2,790**	**2,463**	**2,810**

The preventative maintenance schedule is prepared on the basis of life cycle maintenance plans (LCMPs) for operational assets. GAWB engaged an independent external consultant to assist with the development of the maintenance strategies. It is intended that GAWB will obtain certification of the asset management system under ISO 55001:2014 *Asset management – Management systems – Requirements*. This certification will be subject to bi-annual audits.

A significant inclusion in the preventative maintenance schedule relates to pipeline condition assessments. GAWB has elected to defer capital expenditure to replace certain pipelines, and this has led to increased on-going pipeline condition assessment costs. In order to mitigate the risk of pipeline failure, GAWB will conduct additional pipeline condition monitoring, pipeline repairs, system operational monitoring and interaction with pressure control. Increased expenditure for pipeline condition assessments is planned for 2018–2020

The expenditure forecast also includes an annual allowance for maintenance which will be required following a flood event that is not covered by insurance. This allowance is based upon the costs incurred in the currently regulatory period that could not be recovered from insurance resulting from a flooding event. Since the 2004–2007 drought broke, GAWB has experienced generally wetter than average weather conditions. Awoonga Dam (at 40 metres) has spilled 7 times – December 2010, March 2011, and January, March and June 2012, January and March 2013.[32] Awoonga Dam is currently at 93.0% capacity.[33]

[32] GAWB, *Strategic Water Plan*, November 2013, page 24.

[33] http://www.gawb.qld.gov.au/dam-levels (as at 22 September 2014)

3.8.6 Strategy and asset creation

The key cost driver of Strategy and asset creation is staffing costs which account for approximately two thirds of the total expenditure. Of the remaining expenditure, the significant costs relate to regulatory pricing matters and professional consultancy services (including commercial legal fees, risk management, investigations and draft scopes for potential new capital projects). The variability in the expenditure, particularly in 2019 and 2020, relates to drafting of GAWB's next strategic water plan and preparation for the next price review.

Forecast expenditure in 2016–2020 for the Strategy and asset creation function is compared with Base Year expenditure in Table 19.

Table 19: Strategy and asset creation operating expenditure 2016–2020

	Base Year 2015 $000	2016 $000	2017 $000	2018 $000	2019 $000	2020 $000
Forecast expenditure	3,661	3,506	3,572	3,689	4,131	4,758
Increase vs previous year ($000)		**(155)**	**66**	**117**	**442**	**627**
Increase vs previous year (%)		**–4%**	**2%**	**3%**	**12%**	**15%**
Key areas of expenditure:						
Staffing costs	2,239	2,325	2,397	2,478	2,566	2,666
Regulatory fee	477	505	534	565	598	632
Professional services	656	354	332	330	636	1,124
Other expenditure	289	322	309	316	331	336
	3,661	**3,506**	**3,572**	**3,689**	**4,131**	**4,758**

3.8.7 Corporate services

The Corporate Services function captures costs relating to the day-to-day activities that support all of the identified business functions. There are no significant changes anticipated in the day-to-day operations over the future regulatory period when compared to the current period. GAWB will continue to review and refine its processes to ensure recruitment of efficiencies where possible.

Forecast expenditure in 2016–2020 for the Corporate Services function is compared with Base Year expenditure in Table 20.

Table 20: Corporate services operating expenditure 2016–2020

	Base Year 2015 $000	2016 $000	2017 $000	2018 $000	2019 $000	2020 $000
Forecast expenditure	1,832	1,854	1,924	1,958	2,044	2,109
Increase vs previous year ($000)		**22**	**70**	**34**	**86**	**65**
Increase vs previous year (%)		**1%**	**4%**	**2%**	**4%**	**3%**
Key areas of expenditure:						
Staffing costs	1,032	1,071	1,104	1,141	1,181	1,226
Professional services	270	225	243	236	242	261
Information technology	122	145	132	135	144	146
Other expenditure	408	413	445	446	477	476
	1,832	**1,854**	**1,924**	**1,958**	**2,044**	**2,109**

3.8.8 Allocation of costs to pricing zones

At the 2010 Price Review GAWB adopted principles in allocating operating expenditure forecasts to pricing zones (including recommendations made by the Authority and subsequently endorsed by the QCA Act Ministers). A consistent approach has been applied for the 2011–2015 regulatory period. This allocation is important as it ensures cost reflectivity of individual pricing zones.

The following outlines GAWB's approach to cost allocation:

- GAWB's business is segmented into the following components for allocation purposes:
  - source assets;
  - raw delivery network – comprising all raw delivery pricing zones;
  - water treatment plants – GWTP and YWTP; and
  - potable delivery network – comprising all treated delivery pricing zones.
- Costs for supporting the above segments are treated as support service costs and comprise those costs that cannot be directly assigned to any of the segments listed above.
- If a cost is directly related to one pricing zone, the cost is solely assigned to that Pricing Zone.
- If a cost is directly related to a group of pricing zones, the cost is assigned to those groups of pricing zones based on a relevant expenditure driver (such as asset value).
- Where costs are directly related to a specific segment of GAWB's infrastructure network (e.g. source, raw delivery network), costs are assigned to the Pricing Zones within that segment based on the demand in each respective pricing zone within the segment.
- Where costs are related to more than one segment of GAWB's infrastructure, network costs are:
  - assigned to each respective segment based on a relevant expenditure driver for that cost and
  - allocated to particular pricing zones within the segment based on the demand in each pricing zone within that segment.
- Costs that cannot be allocated to a particular pricing zone are allocated to a Corporate overheads pricing zone. The cost of corporate overheads is allocated in accordance with the methodology recommended by the Authority, i.e. based on the relative administrative effort of providing storage services, raw water delivery and treated water.
- General administration costs are allocated directly to customers on the basis of the relative administrative effort required to provide storage, raw water and treated water services.

3.9 Peer review of operating expenditure

GAWB engaged GHD to undertake a peer review of the operating expenditure relating to its Operations and Asset life cycle management functions. The review undertaken by GHD considered:[34]

- historic operating expenditure compared with the QCA forecasts, to identify movements between the amounts allowed by the Authority and actual cost and performance outcomes;
- methodologies for forecasting and budgeting, including preventative maintenance; and
- forecast operating expenditure in terms of key expenditure drivers, robustness, efficiency and individual major cost items.

In relation to the current regulatory period expenditure, GHD reviewed the major cost categories within each function including the cost drivers for increases over the levels of expenditure identified and included in the QCA forecast operating expenditure. In all instances, GAWB's expenditure was deemed appropriate for meeting GAWB's operational requirements.

[34] GHD, *Review of Operations and Asset Life Cycle Management Expenditure for GAWB's 2015 Price Review*, September 2014, page ii.

GHD also concluded that, in relation to forecasting and budgeting methodologies:[35]

- GAWB has an appropriate and systematic process to build budgets and forecasts;
- GAWB's approach to determining cost escalation is considered reasonable and appropriate;
- forecasts and budgets were subject to appropriate scrutiny and review prior to approval;
- the preparation of LCMPs accords with good asset management practice, while reflecting an early stage of maturity in asset management development; and
- GAWB's management practices are designed to engender prudent spending and cost management, and GAWB is developing its approach to drive efficiencies within the business.

In reviewing GAWB's forecast costs for next regulatory period for the Operations and Asset life cycle management functions, the forecasts were appropriate and reflect reasonable costs taking into account cost escalation. GHD also noted that over the course of the next regulatory period, there are efficiencies and improvements that should be pursued in both of these functions. GAWB's commitment to realising these efficiency savings is outlined in section 3.11.

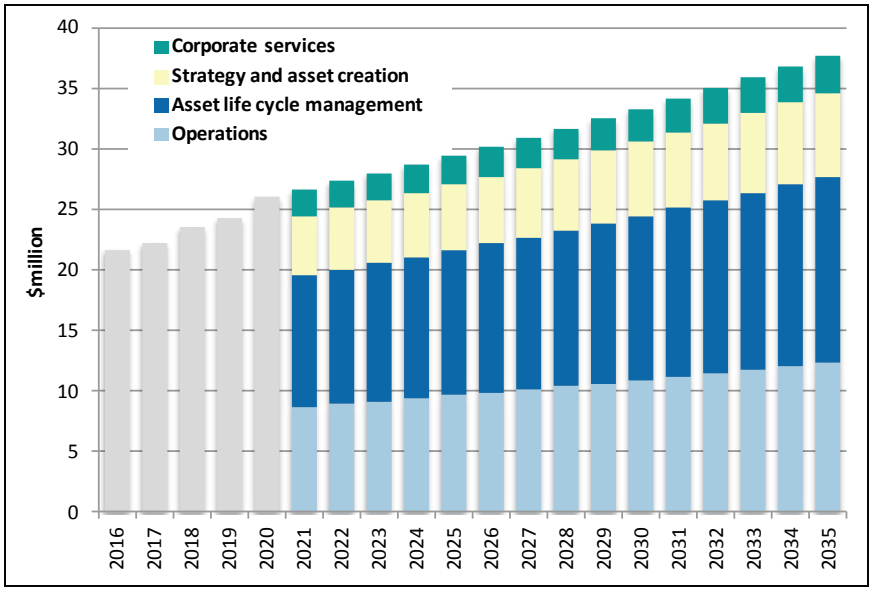
3.10 Remaining 15 years of the planning period

Operating expenditure forecasts beyond the 2016–2020 regulatory period will be assessed for efficiency at the subsequent price review.

Consistent with the approach adopted for the current regulatory period, forecasts for the 2021–2035 period assume a CPI increase over the 2020 forecast expenditure set at 2.5% per annum. In real terms, the expenditure does not increase year on year.

Set out in Figure 7 is a representation of GAWB's operational expenditure for the last 15 years of the planning period.

Figure 7: Total operating expenses by function 2021–2035



[35] GHD, *Review of Operations and Asset Life Cycle Management Expenditure for GAWB's 2015 Price Review*, September 2014, pages iii & iv.

3.11 Additional operating efficiencies

GAWB's operating forecasts set out above include efficiencies that GAWB has been able to recruit over the current regulatory period. Examples of efficiencies include those demonstrated with the in-sourcing of water quality testing, the in-sourcing of easement maintenance activities, and being able to recruit the Authority's efficiency targets that were incorporated into prices from 1 July 2010 for the functions of Strategy and asset creation and Corporate services functions. Moreover, economies of scale are automatically built into GAWB's forecasts (because Base Year costs are not linearly flexed with volume, but forecast explicitly). Finally, costs beyond the 2016–2020 regulatory period are increased by CPI, which automatically includes the average efficiency increase in the economy.

In addition to explicitly forecast and automatically captured efficiencies, GAWB has identified additional efficiency targets in its operating expenditure forecasts. These efficiencies take into account GAWB's current operating environment and current business improvement initiatives. Specifically, the delivery of these business improvement initiatives provides a credible basis for provision of an efficiency dividend in the operating expenditure forecasts.

Efficiencies over the next regulatory period are likely to be recruited in the functional area of Asset life cycle management. As GAWB better understands the condition of its assets and deploys further automation and technology solutions, there is a potential for asset maintenance and associated costs to be reduced.

The delivery of these business improvement projects will occur early in the next regulatory period and will require some settling-in of processes prior to efficiencies being realised. As such, GAWB anticipates achieving operating expenditure efficiencies in 2018 and later years, as outlined in Table 21.

Table 21: Forecast operating expenditure efficiencies 2016–2020

	2016 $000	2017 $000	2018 $000	2019 $000	2020 $000	Total $000
Forecast efficiencies	–	–	515	582	651	1,748
% of Total operating expenditure	0%	0%	2.19%	2.47%	2.68%	1.48%

Beyond the next regulatory period (the final 15 years of the 20-year planning period), GAWB has assumed that efficiencies will increase to 5% of operating expenditure by 2035. The total net present value of efficiencies included in GAWB's operating expenditure forecasts is $9.15 million (including $1.43 million forecast for the next regulatory period).

The operating expenditure forecasts in sections 3.8 and 3.10 do not include these anticipated efficiencies. They have been taken into account in the calculation of indicative prices for the next regulatory period discussed in section 2.

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4 Regulated Asset Base roll-forward

4.1 Introduction

This section articulates GAWB's treatment of the roll-forward of the RAB. In particular, it addresses:

- the methodology for rolling-forward the RAB from 1 July 2010 to 30 June 2015, including the asset valuation basis and capitalisation of return on investment (ROI) during construction;
- asset additions in the period 2010–2014 and forecast capital expenditure for 2015 to be included in the 30 June 2015 RAB value;
- redundant and disposed assets; and
- changes to optimisation, including rolling-in of previously excluded CSS expenditure.

The RAB roll-forward calculation has been undertaken by GAWB in accordance with the Authority's previously recommended methodology.

Table 22 outlines the RAB roll-forward from 1 July 2010 to 30 June 2015, including CSS preparatory expenditure approved by the Authority.

Table 22: RAB roll-forward from 1 July 2010 to 30 June 2015

	$million
Opening RAB 1 July 2010 (2010 Price Review)	**419.60**
Adjustments:	
• Difference between actual and forecast inflation	2.29
• Other adjustments (including capitalisation timing)	(10.88)
Opening RAB 1 July 2010	**411.01**
Add:	
• Acquisitions	67.38
• Inflation	54.95
• Capitalised value of previously excluded CSS expenditure	22.31
Less:	
• Disposals	(2.90)
• Depreciation	(48.03)
Forecast RAB 30 June 2015*	**504.72**
* Excludes the value of the Curtis Island infrastructure.	

Details relating to the Curtis Island Pipeline project expenditure capitalised during 2011–2015 will be provided in a separate customer commercial-in-confidence (confidential) submission.

4.2 RAB roll-forward

GAWB has calculated the opening RAB for the 2016–2020 regulatory period as follows:

- adjustment of 1 July 2010 asset values to remove forecast capital expenditure and include actual asset additions, disposals, inflation and depreciation during 2010;
- roll-forward of the 1 July 2010 asset values using an indexation approach (using actual Brisbane All Groups CPI and straight-line depreciation over the remaining lives estimated in 2010);

- addition of efficient capital expenditure and assets purchased or constructed during the 2011–2015 regulatory period (section 4.3);
- removal of redundant and disposed assets during the 2011–2015 regulatory period (section 4.4); and
- changes to 2010 price review optimisation decisions (section 4.5).

4.2.1 Asset values

The Authority previously recommended that GAWB's regulated asset base be valued on the following basis:[36]

- Infrastructure asses – Depreciated Optimised Replacement Cost (DORC);
- land – market value; and
- easements – historic cost, indexed for inflation

As noted above, GAWB has rolled-forward its asset values from 1 July 2010. GAWB has not experienced any material changes in circumstances that warrant a further DORC revaluation of its assets.

4.2.2 Capitalisation of return on investment during construction

Assets are rolled-in to the RAB on the date of commissioning. GAWB is entitled to a return on investment on the funds employed in constructing a project, in accordance with the Authority's previous recommendations:[37]

> The Authority recommends that work in progress be capitalised using WACC and be recognised in the asset base for pricing purposes once it is fully completed and able to contribute productive capacity to the system.

GAWB calculates ROI during construction only for projects with cost (excluding capitalised ROI) of more than $1 million. ROI has been calculated assuming uniform monthly expenditure over the duration of the project.

4.2.3 Valuation difference in opening value at 1 July 2005

In its submissions to the 2010 Price Review, GAWB identified a difference between opening RAB provided by the Authority and asset valuations but was unable to identify the causes of the difference. The Authority recommended that if GAWB could identify the reasons for differences in the asset valuations, the difference should be included in the RAB from 2015.

GAWB has to date been unable to identify the difference and therefore has not included any adjustment for this difference in the opening value of the RAB at 1 July 2015.

4.3 Asset additions

4.3.1 Current regulatory period capital expenditure

GAWB's capital expenditure during the current regulatory period will total approximately $71.98 million (excluding Curtis Island expenditure and including ROI of $3.18 million), as summarised in Table 23.

[36] QCA, *Final Report – Gladstone Area Water Board: Investigation of Pricing Practices*, June 2010, page 73.

[37] QCA, *Final Report – Gladstone Area Water Board: Investigation of Pricing Practices*, March 2005, page 97.

Table 23: Capital expenditure summary 2010–2015

	QCA forecast CAPEX 2010–2015 $million	Actual CAPEX 2010 $million	Actual/ Forecast CAPEX 2011–2015 $million	Actual/ Forecast CAPEX 2010–2015 $million	CAPEX (higher)/ lower than QCA forecast $million
Projects included in QCA forecast:					
• Projects cancelled/deferred	2.12	–	–	–	2.12
• CAPEX greater than QCA forecast	13.34	3.34	25.52	28.86	(15.52)
• CAPEX less than QCA forecast	46.70	0.74	19.91	20.65	26.05
• CAPEX in line with QCA forecast	0.21	0.21	–	0.21	–
Total projects included in QCA forecast	62.37	4.29	45.43	49.72	12.65
Other projects	–	0.31	18.77	19.08	(19.08)
Total capital expenditure (excluding ROI)	62.37	4.60	64.20	68.80	(6.43)
ROI on capitalised projects	2.03	–	3.18	3.18	(1.15)
Total capital expenditure (including ROI)	**64.40**	**4.60**	**67.38**	**71.98**	**(7.58)**
The QCA forecast CAPEX of $64.4 million includes $50.0 million for the current regulatory period ($53.0 recommended by the Authority in 2010 less $3.0 million impact of escalation factor reduction) and $14.4 million forecast for 2010.					

Projects with material forecast expenditure that the Authority in 2010 allowed to be recovered in prices but which have been deferred or cancelled

Only one project with material forecast expenditure that the Authority allowed to be recovered in customer prices in 2010, was deferred or cancelled in the current regulatory period. All other projects are completed or under construction.

QAL raw pipeline

The QAL raw pipeline is a mild steel cement-lined pipe and is considered to be at the end of its useful life. Based on industry standards, the estimated cost to replace the pipe is slightly more than $1 million per kilometre. Duplication of approximately 1.47km of pipeline between the railway line and QAL plant with 600mm pipe, cross-connected to the existing pipeline with appropriate isolation valves, will allow isolation of the existing pipeline for repairs in the future.

The Authority recommended $0.5 million for cathodic protection of the pipeline as an alternative to replacement, deferring expenditure of $2.1 million that would be required to replace the pipeline.

GAWB undertook further investigations and found that:

1. The approach recommended by the Authority (cathodic/impressed current corrosion protection) is not achievable because the pipeline has rubber ring joints and therefore does not have electrical connectivity. Excavating the pipeline to restore electrical connectivity would be expensive and risky.
2. A review of pipe recovered from sections replaced in 2014 following major leaks/pipe failures showed that:
   (a) The steel pipe wall was generally in a satisfactory condition but failure could occur at the rubber ring joints due to the age of the rubber or, more likely, poor construction practice.
   (b) Where the protective coating had failed, a major failure could occur rapidly from external corrosion (second failure). Failure of protective coating was located at a scour outlet field welded onto the pipe and therefore thought to be rare or at least not widespread.
3. Excavation and investigation of the condition of the pipeline near the railway crossing was difficult due to the depth of excavation, high groundwater levels and potential acid sulphate soils (and attendant safety and environmental risks).

GAWB has therefore concluded that:

- whilst not common, failures could occur anywhere along the pipeline;
- the pipeline is generally repairable where reasonable access is available for excavating the pipeline; and
- for pipeline sections adjacent to or under the railway, repair is impractical and uneconomic.

GAWB plans to construct a new enveloping pipe and a new 600mm MSCL pipe to facilitate a rapid response to any potential interruption to supply in the difficult to repair area adjacent to and under the railway. The estimated cost for this option (planned for 2016) is $0.74 million.

For the 2011–2015 regulatory period, no capital expenditure was undertaken. Therefore there is no expenditure included in the RAB at 30 June 2015.

For the 2016–2020 regulatory period, GAWB will:

- repair leaks in the accessible sections of the pipeline when they arise; and
- undertake a $0.74 million capital expenditure project to reduce the risk of failure in inaccessible sections of the pipeline.

Projects with expenditure in the current regulatory period materially different to the forecast in GAWB's 2010 submissions

GAWB's capital expenditure over the 2010–2015 period on projects that were supported by the Authority for recovery in prices totalled $49.72 million compared to the Authority approved forecast of $62.37 million. This resulted in a total spend lower than QCA forecast of $12.65 million.

Two projects were undertaken during the 2011–2015 period with expenditure materially different to that allowed by the Authority in 2010 and having a material impact on prices:

- OP2010-009 Dam Safety Compliance Works; and
- OP2009-027 Awoonga Dam Spillway AFC Upgrades

Both projects were assessed by the Authority in 2010 as being prudent. To assess efficiency, GAWB engaged Cardno to review projects where expenditure has exceeded the level allowed by the Authority by an amount that will lead to a material increase in price, or the expenditure varied materially from previous forecasts. Cardno have assessed the expenditure on each of these projects as being efficient. A copy of Cardno's report is included at Appendix G.

Dam safety compliance works

The objectives of the project when initially identified were primarily concerned with safety of the dam wall and spillway structure to ensure compliance with regulatory requirements for dam safety, as well as ensuring reliability of water supply to customers.

Included in 2010 prices within the 2011–2015 period was a $0.45 million upgrade of the Awoonga Dam intake crane to meet safety standards.[38] This upgrade has been included as part of this project. However, as the project was identified shortly before GAWB's submission was finalised in late 2009 other costs were not specifically included in GAWB's 2010 submission.

By 2010 a broader program of works had been identified based on further inspections and assessments. Some aspects of the original scope were removed (e.g. automation for remote operation of valves in the river discharge system) or were split out into separate projects where they were not explicitly related to dam safety issues. Other requirements, especially for replacement or refurbishment of mechanical items (in addition to the original structural items), were added to meet project objectives. The initial objectives remained relevant but additional objectives related to compliance with Dam Safety Conditions prescribed by the Dam

[38] QCA, *Final Report – Gladstone Area Water Board: Investigation of Pricing Practices*, June 2010, page 88.

Safety Regulator, compliance with the Boyne River Basin Resource Operations Plan, and condition-based maintenance requirements were added as part of dam safety requirements.

Actual and forecast capital expenditure of $4.4 million has been included in the forecast RAB roll-forward balance. Expenditure has been prudent in order to meet GAWB's regulatory obligations. Scope changes, procurement and variations were managed in accordance with policies, and appropriate supporting documentation. Variations to the program of works continue to be managed with appropriate reviews.

The expenditure not included in the 2010 forecast has been independently reviewed as efficient.[39]

Storage prices (Awoonga Pricing zone) will be affected by this capital expenditure project.

Awoonga Dam spillway AFC upgrade

Included in 2010 prices was $22.11 million ($26 million adjusted for escalation) to replace Saddle Dam 3, on the basis that it was a cost-effective, environmentally-sound and least risk option to meet dam safety and environmental regulatory requirements. The project would also meet acceptable flood capacity (AFC) requirements as issued by DERM (now DEWS) i.e. to achieve 50% of AFC.[40] This was subject to additional options assessment to confirm if there was any effective staged or interim solution available e.g. parapet wall option. Any adjustments to cost would be incorporated into future pricing.

GAWB also submitted that $1 million should be included for raising the Awoonga Dam left abutment on the basis that undertaking it separately would add 20% to the cost.[41] However, this cost was excluded on the basis that the regulatory requirement did not exist until 2025.

GAWB engaged GHD to undertake an options analysis in 2011, which provided seven technically feasible options including the use of a parapet wall.[42] Based on discussions with the Dam Safety Regulator, an options assessment was undertaken considering:

- capital cost (based on an NPV analysis);
- environmental effects;
- social benefits;
- timing and servicing of project delivery; and
- risks if the project did not proceed.

The Dam Safety Regulator preferred options that reduced or eliminated flow through or overflow at Saddle dams into the Tuckers Gully tributaries, even when using erosion protection work. In addition to discussions with DERM (now DEWS) and correspondence with other stakeholders, the assessment identified that GAWB should proceed with the following works:

- raising Saddle Dam 3 to RL55.4m;
- constructing control sill and erosion protection at the Saddle Dam 6 sill;
- raising the Awoonga Dam left abutment spillway to RL57.6m to prevent flood overtopping which might lead to undermining of the wall foundations and wall failure;
- constructing parapet walls on the main embankment and Saddle Dam 3 to RL57.6m; and
- raising Saddle Dam 4 to RL57.6m.

[39] Cardno, *Capital Expenditure Review – QCA: GAWB Capital Works Review*, September 2014, pages 20–22.

[40] QCA, *Final Report – Gladstone Area Water Board: Investigation of Pricing Practices*, June 2010, page 97.

[41] QCA, *Final Report – Gladstone Area Water Board: Investigation of Pricing Practices*, June 2010, page 98.

[42] GHD, *Report for Awoonga Dam Saddle Dam No 3 Acceptable Flood Capacity Assessment*, February 2011.

Under current dam safety guidelines, upgrades can be undertaken in one stage to meet 100% of AFC, or undertaken in three stages to meet 100% of AFC. GAWB elected to use a staged approach.

Dam safety guidelines were updated in 2010 and again in 2013. The effect of the 2013 update reduced the minimum AFC compliance required at stage 1 (from 50% of AFC to 25% of AFC or with at least 1:2000 AEP for erodible embankments) and stage 2 (from 75% of AFC to 65% of AFC). The update highlighted that the Saddle Dam 4 works were no longer required until 2035. To meet minimum AFC requirements based on the 2013 guidelines, works were divided between the following stages:

- Stage 1 (by October 2015): Raising Saddle Dam 3 to RL49.6m, raising the Awoonga Dam left abutment spillway to RL52.21m and acquisition of easements below Saddle Dam 6.
- Stage 2 (by October 2025): Raising Saddle Dam 3 to RL52.9m.
- Stage 3 (by October 2035): Raising Saddle Dam 3 and 4 and Main Dam wave wall to RL57.6m, raising the Awoonga Dam left abutment spillway to RL57.6m and Saddle Dam 6 erosion protection at the Saddle Dam 6 sill.

While stage 1 works continued, GAWB explored efficiency gains from combining stage 1 and 2. Undertaking both stages together allows for design, construction and project management efficiencies as well as capitalising on the advantageous construction market conditions and reducing downstream flood risk during interim stage construction of Saddle Dam 3. These efficiencies were reflected in the NPV cost comparison of undertaking stage 1 by 2015 ($7.099 million) and stage 2 by 2025 ($5.490 million), versus undertaking stage 1 and 2 by 2015 ($9.537 million). Overall, dam safety requirements are met at a lower net present cost by undertaking stage 1 and 2 together for a total capital cost of $8.992 million forecast for 2015.

Given that the decision to consolidate stage 1 and 2 works resulted from a robust demonstration of the likely cost being lower than the sequential construction of these works (i.e. some works in 2015, with the balance of works in 2025), GAWB plans to incorporate these costs into the RAB. GAWB also notes the general benefit to the community from the reduction from risk of flood in extreme events, as well as the Authority's previous acceptance of a forecast cost of $22.11 million as being efficient.

Storage prices (Awoonga Pricing zone) will be affected by this capital expenditure project.

Projects with material expenditure in the current regulatory period that were not included in GAWB's 2010 submissions

GAWB's capital expenditure during the 2011–2015 period on projects that were not forecast at the 2010 price review will total approximately $19.08 million.

This $19.08 million expenditure was across 201 separate projects. Applying the terms contained in the Referral Notice (Appendix A), only one project met the criterion of having expenditure which would have a material impact on any customer's price. Cardno assessed this project as being prudent and efficient.[43] Details of the project are outlined below.

Yarwun inventory shed and forklift

To improve business processes, a light industrial shed, pipe rack and forklift were proposed in 2015 for $0.574 million for storing piping, valves and other spare items and equipment used for network maintenance.

This equipment is currently stored on pallets sitting directly on the ground and exposed to the weather at various sites. Under these conditions, UV degradation and corrosion of the equipment may occur. The uneven surface at the storage site poses difficulties of access during dry periods and during wet weather events inventory items cannot be accessed with the current forklift or a mobile crane.

[43] Cardno, *Capital Expenditure Review – QCA: GAWB Capital Works Review*, September 2014, pages 23–24.

The inventory shed will provide a secure, undercover storage site with improved and safer access to inventory items (regardless of weather conditions) as well as a new forklift better suited to handling longer piping lengths and stacking pallets.

Delivery prices (YWTP pricing zone) will be affected by this capital expenditure project.

4.4 Redundant and disposed assets

There were no redundant assets identified that required removal from the RAB at 30 June 2015. Assets disposed during the 2011–2015 regulatory period have been removed from the forecast opening RAB value at 1 July 2015.

4.5 Changes to optimisation

4.5.1 Changes from 2010 price review

There were no optimisation changes required to new or existing infrastructure during the 2011–2015 regulatory period.

4.5.2 Previously excluded CSS expenditure

GAWB plans to roll-in $22.3 million of previously excluded CSS expenditure (i.e. $14 million plus capitalisation at the WACC rate). This is discussed in more detail in section 10.

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5 Capital expenditure

5.1 Introduction

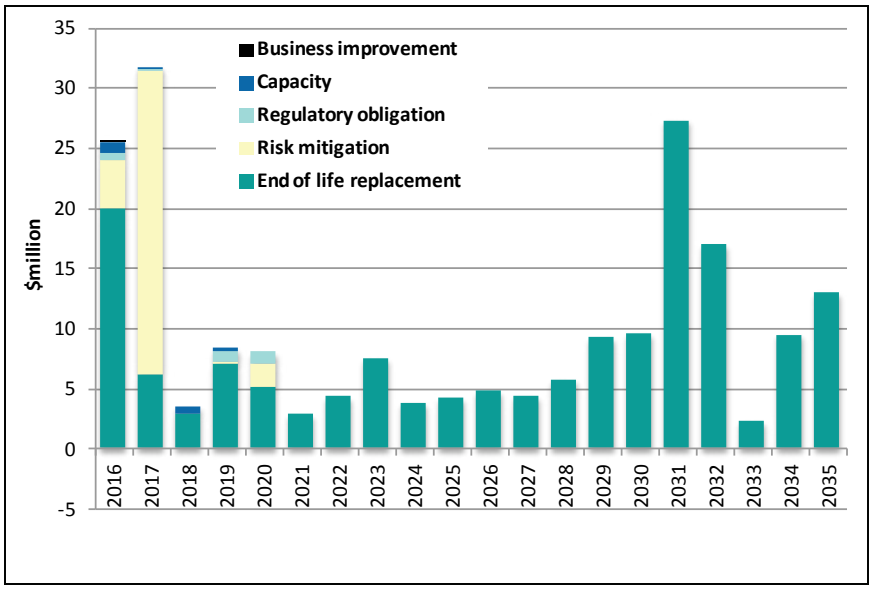
The section sets out GAWB's forecast capital expenditure for the 2016–2035 period.

Capital expenditure for the next regulatory period (2016–2020) is discussed in section 5.2.

Forecast expenditure for the remaining 15 years of the planning period (2021–2035), which is used to set the price path, is discussed in section 5.3.

Figure 8 sets out GAWB's forecast capital expenditure.

Figure 8: Forecast capital expenditure by year and project justification 2016–2035



GAWB's forecast capital expenditure over the 20-year planning horizon is $202.6 million. This capital expenditure comprises:

Table 24: Forecast capital expenditure by year and project justification 2016–2035

	2016 $million	2017 $million	2018 $million	2019 $million	2020 $million	2021–35 $million	Total $million	Total %
Risk mitigation	4.0	25.3	–	0.1	1.9	–	31.3	15.4
End of life replacement	19.9	6.2	2.8	7.1	5.1	125.5	166.6	82.2
Regulatory obligation	0.7	0.2	–	0.9	1.0	–	2.8	1.4
Capacity	0.8	0.1	0.7	0.2	–	–	1.8	0.9
Business improvement	0.1	–	–	–	–	–	0.1	0.1
Capital expenditure	**25.5**	**31.8**	**3.5**	**8.3**	**8.0**	**125.5**	**202.6**	**100.0**

Prior to undertaking any project outlined in the capital works program, GAWB prepares a detailed business case or project plan to ensure that GAWB has:

- clear objectives with benefits articulated;

- demonstrated alignment with organisational goals and objectives;
- understood and managed the impact that the project will have on key stakeholders and the region;
- thoroughly investigated and evaluated technical, economic, social, and environmental considerations to meet the objectives of the project; and
- undertaken procurement in accordance with the Queensland Government Procurement Policy.

5.1.1 Project justification

GAWB has adopted the following justification framework for considering forecast capital expenditure.

Risk mitigation

The project is required to address a credible risk in GAWB's current operating environment that would have high or extreme consequence as assessed in accordance with GAWB's *Risk Management Policy*. The existing residual risk rating will be lowered to an acceptable level by the completion of the project.

End-of-life replacement

The project is required to replace assets that are assessed as being at the end of their useful life or which are assessed as being non-maintainable (e.g. spare parts for servicing are difficult to obtain or prohibitively expensive).

Regulatory obligation

The project is undertaken in compliance with a requirement of law or regulation (for example *Work Health and Safety Act 2011*, *Water Supply (Safety and Reliability) Act 2008*, *Water Act 2000*).

Capacity (including CSS)

The project is required to meet increased customer demand through the augmentation of:

- the delivery network; or
- sources of water supply.

Because GAWB's demand forecast does not include any major new demand over the planning period, no material capital expenditure projects are required to meet additional demand. No projects are required under the 'capacity' justification, with the exception of the CSS.

One project may crystallise prior to the date for draft report by the Authority (28 February 2015). Should this occur, GAWB will consult with customers and the Authority around likely price impacts and make available all supporting documentation (see discussion at section 5.3.2).

Business process improvement

The project is justified by reference to the efficiencies that it will bring to GAWB's operations.

Many projects have multiple benefits. Projects required to meet a regulatory obligation may also have benefits of risk mitigation or business process improvements. In general, only the primary project justification is discussed in this submission.

5.1.2 Cost escalation

In accordance with the Authority's prior recommendation, capital cost forecasts for the 2016–2035 regulatory planning period have been escalated in accordance with the CPI.

5.1.3 Peer review of forecasts

GAWB engaged Cardno to undertake a third-party peer review of actual and forecast expenditure on material projects with capital expenditure likely to have a material impact on any customer's price.

A copy of Cardno's report is included in Appendix G.

5.1.4 Definitions and terminology

Set out below are definitions for determining whether capital expenditure is prudent and efficient. These definitions were utilised recently by SKM, acting for the Authority, in relation to its prudency and efficiency assessment for Queensland Urban Utilities.[44] These definitions were not objected to by the Authority.

Prudent expenditure

Capital expenditure is ***prudent*** when:

> required as a result of a legal obligation, new growth, renewal of existing infrastructure, or it achieves an increase in the reliability or the quality of supply that is explicitly endorsed or desired by customers, external agencies or participating councils.

Efficient expenditure

Capital expenditure is ***efficient*** if:

- The scope of the works (which reflects the general characteristics of the capital item), is the best means of achieving the desired outcomes after having regard to the options available, including more cost-effective regional solutions, the substitution possibilities between capital and operational expenditure and non-network alternatives such as demand management.
- The standard of the works conforms to technical, design and construction requirements in legislation, industry and other standards, codes and manuals. Compatibility with existing and adjacent infrastructure is relevant as is consideration of modern engineering equivalents and technologies. Compliance with regulatory obligations (e.g. water [Network Service Plans]) is likely to be highly relevant.
- The cost of the defined scope and standard of works is consistent with conditions prevailing in the markets for engineering, equipment supply and construction. … For example, the source of comparable unit costs and indexes has been given where available and relevant and the efficiency of costs justified.

Material capital expenditure

The Referral Notice for GAWB's price monitoring investigation provides for the following in relation to capital expenditure:

> 2(f) for capital expenditure to be included in the forecast RAB, the Authority is to form a view on prudency and efficiency, with the focus on cost areas which are material to price changes rather than matters which are likely to have a minor and inconsequential impact

Further to commentary relating to materiality in section 1.2.1, the test of materiality that GAWB has applied is if the level of expenditure that gives rise to a change in customer prices of greater than 1%.

[44] SKM, *Prudency and Efficiency Assessment – Queensland Urban Utilities, Queensland Competition Authority, Price Monitoring of South East Queensland Water and Wastewater Distribution and Retail Activities 2013–2015*, January 2014, page 3.

5.2 Next regulatory period (2016–2020)

GAWB has forecast capital expenditure of $77.1 million during the 2016–2020 regulatory period, as summarised in Table 25.

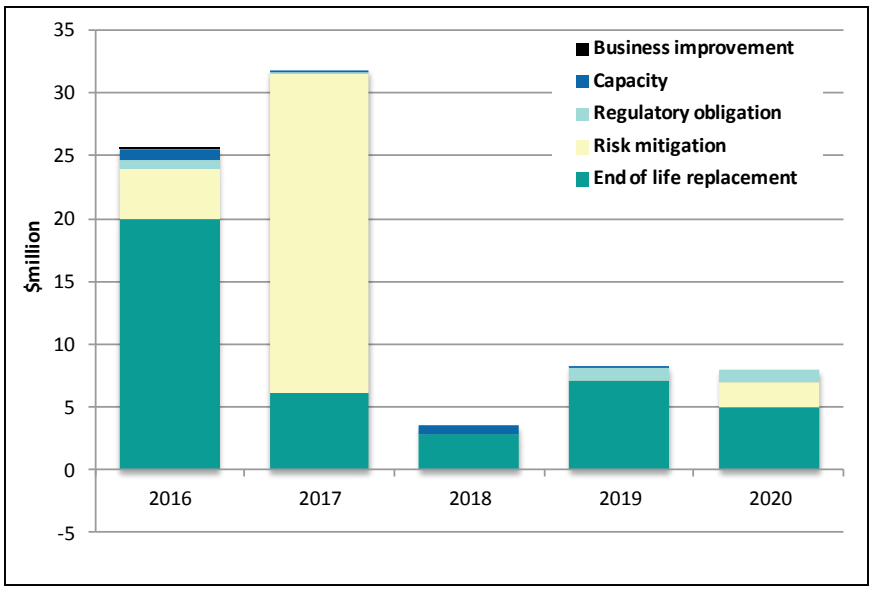
Table 25: Forecast capital expenditure by year and project justification 2016–2020

	2016 $million	2017 $million	2018 $million	2019 $million	2020 $million	Total $million	Total %
Risk mitigation	4.0	25.3	–	0.1	1.9	31.3	40.6
End of life replacement	19.9	6.2	2.8	7.1	5.1	41.1	53.3
Regulatory obligation	0.7	0.2	–	0.9	1.0	2.8	3.7
Capacity	0.8	0.1	0.7	0.2	–	1.8	2.3
Business improvement	0.1	–	–	–	–	0.1	0.1
Capital expenditure	**25.5**	**31.8**	**3.5**	**8.3**	**8.0**	**77.1**	**100.0**

Details of each of these and the major projects included in the age-based and condition-based replacement of assets program follow.

Figure 9 shows GAWB's 2016–2020 regulatory period capital expenditure by year and project justification.

Figure 9: Forecast capital expenditure by year and project justification 2016–2020



5.2.1 Risk mitigation

Ensuring an informed allocation of risks requires that GAWB:

- identify the inherent risks of supply interruption that exist within its supply system (which incorporates both water source and water delivery and treatment assets) and the potential consequences of such a supply interruption; and
- develop risk mitigation proposals to address the impact of one (or more) of the inherent risks materialising.

Communication of these assessments and GAWB's proposals in response (in relation to its water source and/or delivery and treatment systems) including details of expected costs and the potential impact on future prices ensures customers have an informed understanding of the water supply risks and actions being undertaken by GAWB.

In proposing to undertake capital expenditure to enhance its water supply network and provide an improved risk profile for its customers, GAWB is providing an improved level of service for customers.

Provision of a higher level of service will result in higher costs that will ultimately need to be recovered. It is therefore appropriate for GAWB to consult with customers in relation to the risk profile/level of service they require (and are prepared to pay for) and to then respond accordingly. Prices for those customers that take the benefit of the additional infrastructure will reflect the higher level of service provided to them.

The five-yearly price review process provides a defined and formal mechanism through which GAWB is able to advise its intended future capital expenditure on its water supply system infrastructure and customers have the opportunity to provide detailed submissions in response. As a specialist water service provider, in framing its capital expenditure forecasts, GAWB has sought to articulate its assessment of the level of investment required to meet the planned targeted level of risk in the supply of water to customers.

GAWB has introduced a network design standard and planned a number of projects to mitigate corporate risks. The network design standard and material risk-mitigation projects are described below.

Network design standard

GAWB's Strategic Water Plan undertook an analysis of GAWB's water delivery network.[45] That analysis included an assessment of the network failure risks that had the potential to lead to a customer supply interruption.

In an assessment of the risks of a failure within GAWB's water delivery network, it is open to GAWB to consider risk mitigation options to ameliorate the consequences of a network failure and for customers to consider options to ameliorate the consequences of a supply interruption. Customer options (including for example, on-site storage) can potentially provide the best mitigation to a risk of supply interruption. It is however ultimately for customers to decide what action (if any) they take to mitigate these risks and therefore GAWB has confined its assessment to the possible risk mitigation actions that it can undertake.

GAWB has introduced a network design standard for its delivery network infrastructure. This network design standard represents a planning approach to construction of the necessary infrastructure that comprises the delivery network, and stipulates that a minimum level of 'risk storage' be maintained in the delivery network.

Maintaining a minimum level of 'risk storage' in the delivery network is designed to serve as a risk mitigation measure to reduce the impact of possible network failures on customers. Whilst it must be recognised that a certain level of latent risk can never be removed (only minimised), this risk storage will be used to maintain continuity of supply in the event of a network failure and reduce the likelihood of a supply interruption occurring.

GAWB has set a target of 24 hours as the period of time within which it generally can repair all network failures (other than failures that occur in certain locations with access limitations). The network design standard therefore targets maintaining a minimum of 24 hours available risk storage.

GAWB has developed operational plans to ensure that repair response times for potential network failures in locations with access limitations are optimised. GAWB will also assess opportunities to improve access for these network locations such that repairs (if necessary) can be performed within a 24-hour period.

[45] GAWB, *Strategic Water Plan*, November 2013, Section 4

The assessment of GAWB's delivery network storage has identified those zones of the delivery network that have sufficient levels of risk storage to meet the design standard as well as those zones which, based on current average demand levels, require additional risk storage to be developed in order to meet the design standard.

Boat Creek expansion – Stage 1

Current demand levels identify the need for additional risk storage within the raw water network of the North Industrial pricing zone. Current storage capacity is 29ML which is less than 24 hours supply. An increase in available storage to 38.5ML (i.e. new storage of 9.5ML) is required to provide a minimum of 24 hours supply (risk storage) for the North Industrial pricing zone.

GAWB has assessed the options for additional storage in the North Industrial pricing zone as being either a new reservoir at Aldoga or an expansion of the Boat Creek Reservoir. GAWB's recommended option is a staged expansion of Boat Creek Reservoir.

GAWB intends to enlarge the Boat Creek Reservoir to provide additional water security in the North Industrial pricing zone. The reservoir currently contains less than 1 day risk storage for the North Industrial pricing zone. The objective of the project is to achieve 24 hours available risk storage for all parts of the delivery network. The expansion of the Boat Creek Reservoir will achieve the minimum requirement.

Aurecon have provided a report (January 2014)[46] detailing a scope of work and cost estimate for the expansion of Boat Creek Reservoir in two stages. GAWB intends to undertake Stage 1 with capital expenditure of $3.126 million during the 2016–2020 period.

An external review of forecast expenditure on this project undertaken by Cardno has determined that it is prudent and efficient.[47]

Delivery prices in the Central/Mt Miller/Hansen Rd zone (and downstream zones) will be affected by this capital expenditure project.

The price impact of this project is approximately $10/ML. It is marginally material for two customers. For these customers, stage 1 of the Boat Creek expansion raises prices by just under 1%.

Low lift and ultra high lift pump station switchboard and variable speed drives

Two pump stations at the GWTP deliver water to the GAWB potable delivery network and GRC reticulation systems. The pumps are referred to as the 'High Lift' and 'Low Lift' pump stations. The current switchboards and pump motor controls are ageing and there are issues with peak power demand (as experienced in late 2013) exceeding the nominal rating of the power supply transformers.

This project will address risks to delivery posed by ageing assets and managing risks to the electrical supply.

The planning and design phase of the project has an approved budget of $1.03 million. Welcon was engaged to consider the following project options:

- Option 1 – Install variable speed drives (VSDs) only (no switchboard upgrade);
- Option 2 – Direct replacement of High Lift/Low Lift switchboards;
- Option 3A – Install combined High Lift/Low Lift switchboard; and
- Option 3B – New switch room.

[46] Aurecon, *QCA Project Estimates 2014/15 – Boat Creek Reservoir*, 30 January 2014.

[47] Cardno, *Capital Expenditure Review – QCA: GAWB Capital Works Review*, September 2014, pages 25 & 28.

Evaluation of alternatives is ongoing. Most recently, consideration has been given to decommissioning the Low Lift pump station altogether. Whilst this may have slightly higher initial capital costs it is expected to be favourable on an overall lifecycle cost basis as there would be lower overall peak power requirements and lower total energy consumption, as well as eliminating future replacement costs for the Low Lift pump station and deferral of transformer upgrade costs.

A budget of $5.1 million is currently estimated and allowed for in GAWB's capital expenditure forecast. The final cost will depend on the preferred option selected, on market offers and detailed design.

The forecast expenditure has been independently reviewed and deemed efficient.[48]

Delivery prices in the Gladstone Water Treatment Plant zone (and downstream zones) will be affected by this capital expenditure project.

The price impact of this project is approximately $33/ML. It is material for one customer. For this customer, the pump station switchboard upgrade project raises prices by approximately 2%.

Offline storage and repump station

A primary risk to the reliability of GAWB's delivery network is its reliance upon the daily operation of the Awoonga Dam Pump Station (ADPS). ADPS is an important asset in the water delivery network and crucial to pumping water from Awoonga Dam.

In order to replenish delivery network storage it is necessary to pump water from Awoonga Dam every 24 hours. Consequently, maintenance can only be performed on ADPS and the infrastructure connecting it to Awoonga Dam in constrained circumstances.

A risk assessment concluded that even though appropriate pumping redundancy exists in ADPS and despite the work undertaken by GAWB to manage risks (including improvements to electrical systems, pump maintenance and development of response plans), the potential for failure remains. Considering the critical nature of the asset and that such failure could credibly take up to 14 days to repair, it is prudent for GAWB to actively develop risk mitigation actions.

Therefore in response to:

- the need to perform maintenance on ADPS (and connecting infrastructure) that is considered necessary and which is more comprehensive than is currently possible; and
- the credible risk of ADPS failure identified by the risk assessment,

GAWB is planning construction of a suitably sized storage dam within GAWB's delivery network, between Awoonga Dam and Toolooa Reservoir. This storage dam would be filled by supply from Awoonga Dam and would be maintained in storage until required. This planned offline storage would provide approximately 14 days supply so that necessary comprehensive maintenance is able to be performed on ADPS and in order to maintain customer supply in the event of a failure of ADPS. Such an offline storage would significantly improve the delivery network security and reliability by reducing the probability of extended supply interruption in the event ADPS was not operational.

In its 2010 expenditure submissions, GAWB sought to construct additional storage within its delivery network to mitigate the risks resulting from the continuous operation of the Awoonga Pump Station at an estimated cost of $22 million.[49] The Authority determined that only $2 million should be taken into account for pricing purposes, as the supply risk identified is relevant, but that "GAWB had not provided a convincing case for its augmentation option".[50]

[48] Cardno, *Capital Expenditure Review – QCA: GAWB Capital Works Review*, September 2014, pages 26–28.

[49] GAWB, *Expenditure Proposals for the 2010 Price Review*, December 2009, pages 3 & 26.

[50] QCA, *Final Report – Gladstone Area Water Board: Investigation of Pricing Practices*, June 2010, page 108.

In accordance with the Authority's 2010 recommendations, GAWB undertook further works to confirm its preferred option to mitigate these risks and also to improve the certainty associated with estimates concerning the attendant expenditure.

Following consideration of all credible options (including emergency use of the 'Callide Pump Station' and the use of diesel generators at Awoonga Dam), two options remained:

- 1,200 ML in-system storage located at Toolooa; and
- pontoon pump station located at Awoonga Dam.

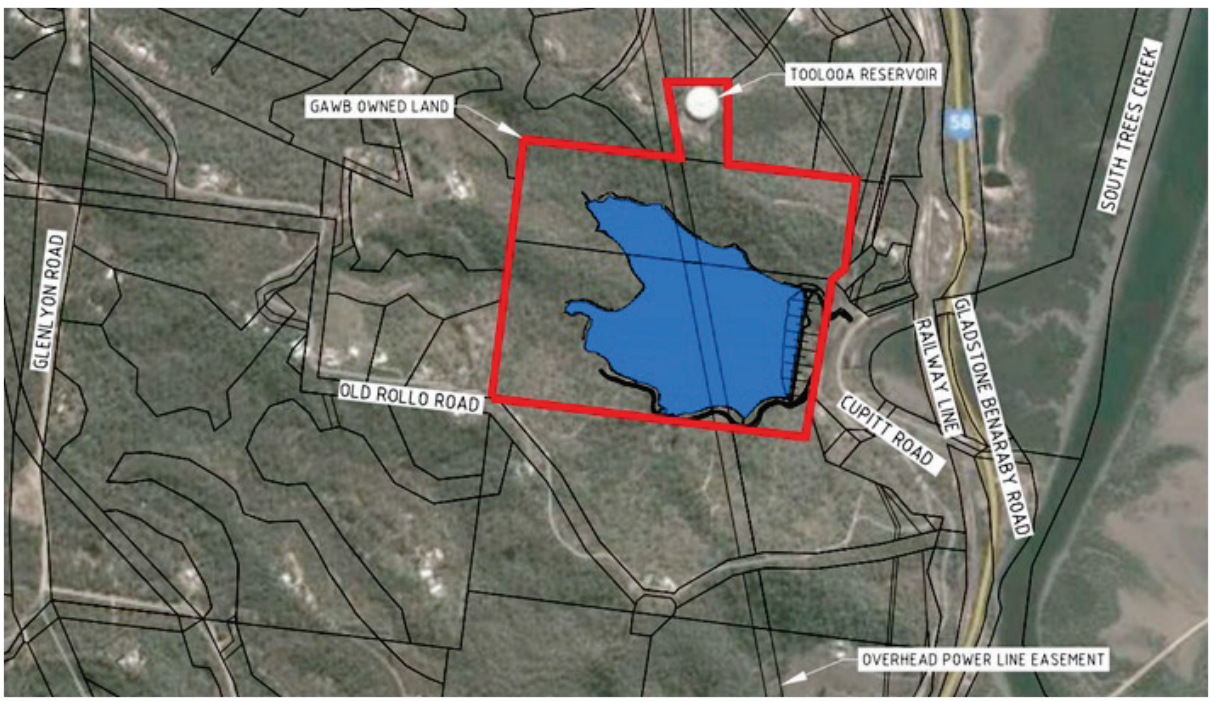
Using a multi-criteria assessment process that considered:

- lifetime estimated costs;
- maintainability and durability;
- operability, reliability and risk; and
- the capacity to stage a response to future events,

GAWB determined that the creation of approximately 14 days' supply from an offline storage represented best value in the specific circumstances.[51] In particular, the pontoon pump station did not address pipeline failure risks between the Awoonga Dam and the identified offline storage site, and introduced operational and maintenance risks with the location of the pumping system over water.

Since this time, GAWB has acquired the relevant site at Toolooa (Figure 10) which has enabled it to undertake geotechnical testing and other environmental studies that provide greater certainty around project scope and thus estimated cost.

Figure 10: Schematic – Offline storage and repump station location



[51] CDM Smith, *Offline Storage and Standby Pump System – Multi Criteria Analysis*, September 2014.

In GAWB's assessment, there are three critical factors that warrant this investment. They are:

Network risk

As canvassed in GAWB's Strategic Water Plan,[52] risk assessments have identified various credible failure scenarios with durations of up to 14 days. With only one current water source and limited in-system storage, GAWB generally seeks to replenish depleted reservoirs at night, utilising reduced electricity tariffs for the pumping of water from Awoonga Dam. If a failure at ADPS did occur, for whatever reason, a consequential impact is an interruption of water supply to customers that would start within one day and such cessation to continue for a duration of up to 14 days.

GAWB understands that the potential for such a supply interruption to be unacceptable to its customers, many of whom use water as critical input to their production processes.

Importantly, a major source of risk to the operation of the ADPS is the reliability of supply from the Ergon owned and operated Awoonga electrical sub-station, and the high voltage electrical network upstream of the sub-station. The size and arrangement of the electrical motors at the Awoonga Pump Station would require the use of a very large generator or bank of generators, and a step up transformer; neither of which are available on short notice (if at all). The offline storage standby pumping system has multiple smaller pumps to minimise starting current requirements and built in step up transformers, which allow the use of typically available generators in the event of a power system failure.

Critical maintenance

Essential maintenance is difficult to undertake from the inlet tower through the associated valves and pipeline to the pump station, and in the single pipeline under the spillway channel, due to the limited timeframe in which such assets must be de-watered and work completed to enable the pump station to be returned to operation (12 hour to 16 hour window). This limited timeframe creates substantial risk to the efficient completion of maintenance activities.

These maintenance activities should be conducted at five-yearly intervals to accord with recommended asset management practice, but were undertaken for the first time during 2012 (30 years after installation) when GAWB was first able to identify and execute an acceptable refurbishment methodology having regard to these constraints. These constraints resulted in a substantial premium in the cost of these works of approximately $2 million and required long lead-time to affect the necessary planning and procurement.

Having regard to the critical nature of ADPS to the GAWB supply network, the occurrence of unforeseen problems with such maintenance activities would be likely to result in a failure to supply, with breakage of valves (as an example) likely to lead to a supply interruption of 7–10 days duration, given the specialised nature of such infrastructure.

GAWB submits that it poses unacceptable risk for the undertaking of critical maintenance activities upon such a vital asset (the continuous operation of which is critical to the reliability of supply to customers) to be constrained in this way.

For these reasons, GAWB submits that it is prudent for such risks to be mitigated by the forecast capital expenditure. Such capital expenditure investment will facilitate the undertaking of critical maintenance activities, as they are required without unreasonable constraints or intolerable risk.

Obsolescence of existing redundant pipeline

GAWB's current (pipeline) delivery network from Awoonga Dam to Toolooa is via two pipelines. Both pipes are not required for capacity purposes, but this redundancy has been assessed in prior price reviews as 'necessary and efficient' due to the risk of

[52] GAWB, *Strategic Water Plan*, November 2013, section 4.4.2.

failure of one of the pipelines. The older of these pipes is now 50 years of age and is expected to be decommissioned at some time in the next 20 years due to evidence of failure of the internal cement lining (extensive in the Awoonga to Toolooa section) and subsequent advanced internal corrosion.

The investment in the Offline Storage would negate the need for investment to replace this redundant pipeline and, as it has been previously accepted that this redundancy is 'necessary and efficient', such an investment should be similarly determined to the extent that it represents lower or same cost. The replacement cost of the pipeline is estimated (conservatively) at over $40 million, which is substantially more than the estimated cost of the planned Offline Storage.

Although less critical, the existence of a 1,200 ML offline storage located at Toolooa would afford GAWB with the capacity of providing raw water with 'normal' suspended solids and turbidity during flood events (or similar) that cause temporary spikes in the suspended solids and turbidity of water extracted from Awoonga Dam. Water from Awoonga Dam normally has low turbidity (2–4 NTU), but turbidity has increased dramatically during times of flood (to 500 NTU in February 2013). YWTP and Plant 2 at GWTP are not designed to treat water to potable water standard during periods of very high turbidity (100 to 150 NTU).

The existence of the planned offline storage would allow supply of raw water to raw water customers and water treatment plants at more 'normal' turbidity during such periods. This would improve the reliability of the treatment process that would have particular value to customers that are serviced by YWTP, but which would also benefit customers serviced by GWTP. There would also be a benefit to raw water customers generally during these periods, as some customer raw water and private treatment processes are affected by very high raw water turbidity.

Both severally and cumulatively, these factors contribute to make prudent the investment to mitigate the risk of a supply failure to customers of an extended and unacceptable duration. GAWB expects that this proposition will be accepted by its customers.

Without the offline storage, GAWB would seek to manage such risks as best as it can from an operational perspective but would recommend customers structure their operations to enable them to tolerate water supply failures of up to 14 days due to extreme events.

Capital expenditure of $21.9 million is forecast for 2017.

The forecast expenditure has been independently reviewed and deemed efficient.[53]

The Offline Storage project will increase prices by approximately $25/ML for all customers using the delivery network.

Table 26 shows that the effect of excluding this project from GAWB's capital expenditure programme would be to reduce prices by approximately 2% to 3% for raw water customers and 0% to 2% for potable water customers.

[53] Cardno, *Capital Expenditure Review – QCA: GAWB Capital Works Review*, September 2014, pages 25–28.

Table 26: Sensitivity of indicative 2016 water prices to the Offline storage project, by pricing zone

Pricing zone	Price impact of excluding Offline storage CAPEX
Awoonga	0%
Boyne Raw	–2%
Central/Mt Miller Pipeline/Hanson Rd Pipeline	–3%
QAL	–3%
Fisherman's Landing Raw	–2%
Gladstone City	–2%
GWTP to South Gladstone	–1%
Calliope	–1%
South Gladstone to Toolooa	–1%
Boyne Potable	–1%
Benaraby	–1%
North Industrial Potable	–1%
Fisherman's Landing Potable	0%
Boat Creek to East End	0%

5.2.2 End-of-life replacement

The following asset replacement projects with material expenditure are forecast for the next regulatory period.

YWTP switchboards/MCC replacement

The Motor Control Centre (MCC) at YWTP has reached the end of its useful life. The equipment is 22 years old and it is difficult to source components for failures. Any failure of a component usually requires a retro fit of equipment.

The scope of the project is to carry out a concept design to establish cost requirements followed by detailed design then procurement and installation of a new MCC. The new MCC will be designed to control the clear water pumps, backwash pumps and the soda ash system as well as have a general power distribution section. The project will essentially deliver a 'like-for-like' of the existing board with the exception of upgrading the auto transformer starter and soft starter on the clear water pumps to VSDs.

$0.6 million capital expenditure is forecast for 2016.

The forecast expenditure has been independently reviewed and deemed efficient.[54]

Delivery prices in zones downstream of the YWTP will be affected by this capital expenditure project.

The price impact of this project is approximately $34/ML. It is material for two customers. For these customers, the YWTP switchboard/MCC replacement raises prices by just over 1%.

East End reservoir – various works

A survey of the East End Reservoir undertaken by Vinsi Partners indicated that the degree of cracking and lime leaching to the external wall surfaces of the reservoir has increased since the last survey undertaken in 2007.

At locations of low concrete cover, corrosion of reinforcement/post tensioning ducts is a risk. Exposure of the duct at one location on the reservoir showed localised corrosion to the strands, which could lead to localised failure of the post tensioning

[54] Cardno, *Capital Expenditure Review – QCA: GAWB Capital Works Review*, September 2014, pages 25–28.

ducts with resultant loss of reservoir structural integrity. The corrosion poses a risk of failure that would be mitigated by undertaking remedial works. The work undertaken will involve rectification of the concrete (externally), external strengthening, roof repairs and testing on completion.

A schematic generated by Donald Cant Watts Corke provides a detailed scope of work. $1.2 million capital expenditure is forecast for 2017.

The forecast expenditure has been independently reviewed and assessed as being prudent and efficient.[55]

Delivery prices in the Boat Creek to East End pricing zone will be affected by this capital expenditure project. The price impact of this project is approximately $540/ML in that zone. It is material for one customer. For this customer, the reservoir works raise prices by approximately 6%.

South Trees pipe bridge – structural refurbishments

The sixteen span bridge constructed circa 1985 spans the Boyne River's South Trees inlet and carries two pipelines for raw and potable water. The bridge is suffering from various forms of corrosion and is deteriorating as a result.

In considering options to address the issue Vinsi Partners concluded that;

1. Doing nothing and incurring costs for continued monitoring will not improve the condition of the bridge.
2. Full or partial replacement is unnecessarily expensive as the existing structure is operational with no severe risk identified.
3. Repair of the existing structure is the most economical option to extend the life of the structure.

In progressing the repair of the bridge structure the forecast works can be categorised as:

- replacement of walkway and handrail sections;
- reinstatement of protective coatings to pipelines;
- concrete rehabilitation (bridge structure, pile caps and columns); and
- protective works to marine support structure (pile wraps and cathodic protection to steel reinforcement).

The project will address occupational health and safety (OH&S) issues in relation to use of the walkway (that is now considered unsafe), and will include application of protective coatings to extend the life of materials and rehabilitation of concrete to restore the structure to good condition.

GAWB carried a Stage 1 Condition Assessment for the pipe bridge structure in 2013 and outlined a preliminary scope of work to remediate the structure.

$1.7 million capital expenditure is forecast for 2016.

The forecast expenditure has been independently reviewed and assessed as being prudent and efficient.[56]

Delivery prices in the Boyne Raw pricing zone will be affected by this capital expenditure project. The price impact of this project is approximately $140/ML in that zone. It is material for one customer. For this customer, the South Trees pipe bridge structural refurbishments raise prices by approximately 10%.

5.2.3 Regulatory obligation

No new compliance projects with material impacts on any customer's price are forecast for the next regulatory period.

[55] Cardno, *Capital Expenditure Review – QCA: GAWB Capital Works Review*, September 2014, pages 26–28.

[56] Cardno, *Capital Expenditure Review – QCA: GAWB Capital Works Review*, September 2014, pages 27–28.

5.2.4 Capacity

No new capacity (including expenditure upon the CSS) projects with material impacts on any customer's price are planned for the next regulatory period.

5.2.5 Business process improvement

There are no business process improvement projects with material impacts on any customer's price forecast for the next regulatory period.

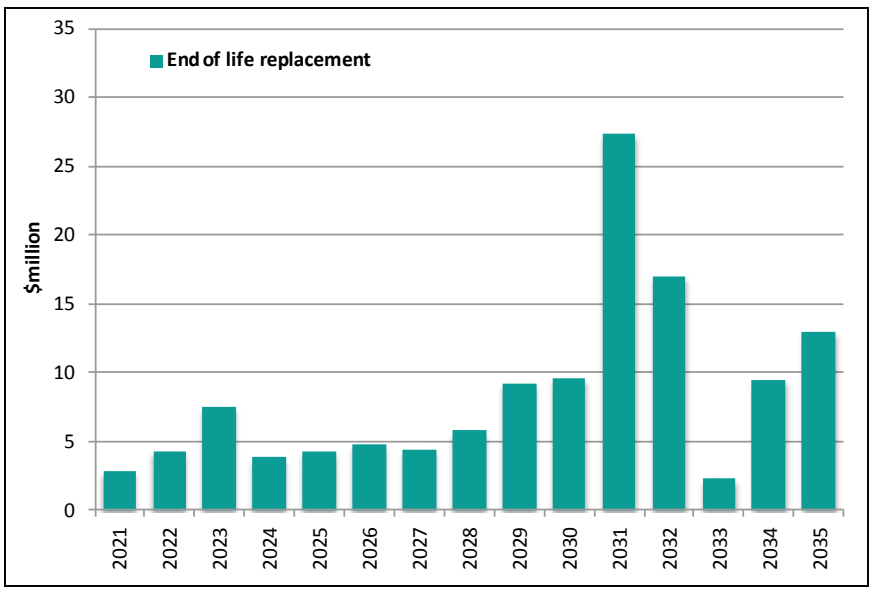
5.3 Remaining 15 years of planning period

GAWB's 20-year planning period requires it to forecast costs for 15 years beyond the end of the next regulatory period. Forecast expenditure beyond the next regulatory period, i.e. after 2020, is used solely for the purpose of setting the price path for the next regulatory period (2016–2020).

GAWB's regulatory regime contains a revenue carryover mechanism. This mechanism ensures that GAWB only recovers the net present value of the building block revenue for the five years of the next regulatory period (2016–2020).

Figure 11 shows GAWB's forecast capital expenditure for the final 15 years of the planning period (2021–2035).

Figure 11: Forecast capital expenditure 2021–2035



GAWB's forecast capital expenditure for 2021–2035 totals $125.4 million. This expenditure is related to age-based and condition-based replacement of assets

5.3.1 End-of-life asset replacement

Asset replacement expenditure totals $126 million 2021–2035. While expenditure in the majority of years remains below $10 million per annum, higher capital expenditure is forecast in 2031 and 2031 is forecast to replace existing assets:

- Pipeline replacements within the following pricing zones – Hanson Road (impacting the Central and Curtis Island pricing zones) and QAL: $7.5 million;

- Reservoir capital works: $5.5 million; and
- Pump replacement in the Awoonga to Toolooa pricing zone ($4 million) plus reservoir capital works ($2 million) and minor works ($3 million).

The requirement for replacement capital in future periods will be known in greater detail through condition monitoring and assessment of the asset.

5.3.2 Capacity

Contingent Supply Strategy – GFP transition and management

CSS expenditure is discussed in section 10.5.

North Industrial potable supply augmentation

GAWB is currently in discussions with a customer in the North Industrial area regarding a significant increase in contracted potable water demand at its site. The customer intends to make a decision regarding its potable water demand in the next six months.

If the customer contracts for additional potable water, GAWB will need to increase the capacity of its potable water supply to the North Industrial area.

GAWB has identified two options (each with several sub-options) for providing the additional capacity:

- upgrading YWTP or
- utilising spare capacity at GWTP by converting the Hansen Rd pipeline to potable use (the 'potable interconnection' option).

The two options have similar costs. Either augmentation would increase the potable water price in the North Industrial Potable pricing zone by around 20% (and decrease the price in upstream zones).

If the customer elects to contract for additional potable supply, GAWB will provide details of its preferred augmentation and price impacts in its submission in response to the Authority's draft report.

5.3.3 Business process improvement

There are no business improvement initiatives under the expenditure identified over the 2021–2035 period.

6 Demand forecasting

This section sets out GAWB's approach to forecasting demand.

For the 2016–2020 period, GAWB will develop a demand forecast consistent with the Authority's 2010 recommendations.

For the remainder of the 20-year price-averaging period, GAWB will adopt a forecast that results in full utilisation of Awoonga Dam at the end of the period. GAWB considers that this approach:

- **recognises that the primary purpose of the 20-year planning period is to share the cost of spare capacity between current and future users;**
- **is consistent with the Authority's objectives when establishing the 20-year planning period; and**
- **is consistent with GAWB's water supply agreements and the CSS.**

6.1 Introduction

GAWB's regulatory framework includes a 20-year price-averaging period. Therefore, for each price review GAWB must develop a 20-year forecast of demand.

In previous price reviews only a 20-year forecast of annual contracted volume was required. However, because GAWB is changing the basis of delivery system charging from annual volume to MDQ, for the 2015 price review 20-year forecasts of both contracted annual volume and contracted MDQ are required.

The Authority's 2010 recommendation requires that GAWB's forecasts:

> should reflect existing contracted volumes, anticipated contracted volumes and a component to reflect expected long term growth.

GAWB agrees that demand forecasts for the 2016–2020 period should reflect existing contracted volumes and anticipated contract volumes.

However, consistent with GAWB's submission to the 2010 price review, the annual volume forecast for the 2021–2035 period is premised upon the existing storages being fully utilised by the end of the forecast period.

GAWB's detailed demand forecasting methodology is set out in GAWB's Strategic Water Plan.[57]

6.2 2016–2020 regulatory period

6.2.1 Approach for forecasting annual volumes

For the 2016–2020 regulatory period, GAWB has forecast annual volume consistent with the Authority's 2010 recommendation. That is the annual volume forecast includes existing contracted volumes and anticipated contract volumes (for the contract annual volume forecast) and anticipated actual volumes (for the metered annual volume forecast).

GAWB has met with each of its customers to discuss future demand requirements for both its Strategic Water Plan[58] process and the MDQ pricing roll-out. GAWB's demand forecasts reflect customers' contracted or committed volumes and statements of anticipated actual volumes.

[57] GAWB, *Strategic Water Plan*, November 2013, section 5.2.

The only existing customer forecasting gradual demand growth over the 2016–2020 period is GRC. GRC's growth forecasts are included in GAWB's demand forecast.

New industrial customers have significant lead-times. GAWB has no current enquiries from potential customers that would require a water supply within 5 years.

6.2.2 Approach to forecasting MDQs

Existing customers have MDQs specified in their contracts. However, GAWB recognises that these existing contracted MDQs have not been used for billing and therefore may have been specified inaccurately. On one hand there was no penalty for specifying a high MDQ, so some customers may have specified the contract MDQ very conservatively to ensure that GAWB is required to provide a large flow rate. On the other hand, some customers may have not fully considered the issue (because it didn't drive commercial outcomes) and under-specified MDQ. For these reasons GAWB will initially forecast MDQs based on historic metered quantities rather than contracted quantities.

For MDQ forecasts:

- GAWB has used the metered MDQ from the past two years as the base reservation; and
- where existing customers are forecast to increase their annual volume reservation over time, GAWB has increased the MDQ in the same ratio as the annual volume increase (i.e. a forecast 2% p.a. increase in contracted annual volume reservation would result in a 2% p.a. increase in forecast contracted MDQ).

6.3 Remaining 15 years of the planning period

Consistent with GAWB's submission to the 2010 price review, for the period 2021–2035, GAWB is adopting a forecast that results in full utilisation of Awoonga Dam at the end of the planning period.

6.3.1 Purpose of this demand forecast

The purpose of including a demand forecast beyond 5 years is twofold:

- to share the recovery of the costs of efficient spare capacity between current and future users of the system – GAWB's approach specifically addresses this purpose; and
- to promote efficient long-term pricing – GAWB's approach combined with the CSS specifically addresses this purpose.

Given the nature of GAWB's customer base, 'single point' long-term forecasts for GAWB are themselves speculative. GAWB's approach is consistent with the CSS (and, by comparison, an approach that resulted in the 'pricing in' of future supply augmentations is not consistent with the CSS).

For the avoidance of doubt, the purpose of this 20-year demand forecast is not to assess requirements for future supply capacity. GAWB separately plans to meet emerging demand in a timely manner. This process acknowledges that large demand increments may be required in relatively short period of time. GAWB's Strategic Water Plan[59] provides a comprehensive explanation of GAWB's planning arrangements and the CSS.

[58] GAWB, *Strategic Water Plan*, November 2013, page 85.

[59] GAWB, *Strategic Water Plan*, November 2013.

6.3.2 Criticism as arbitrary

In 2010 the Authority commented that GAWB's proposed approach was "arbitrary". GAWB agrees that the approach is arbitrary, but it is not arbitrary in terms of outcomes.

As part of the Strategic Water Plan[60] process, GAWB commissioned Wedgewood White Limited (WWL) to undertake a demand forecast based on estimated probabilities of known projects and a statistical analysis of the arrival rate of large industrial customers.[61]

This analysis showed that the estimated demand ten years from the forecast date had very large uncertainty: WWL estimated that there was an 80% probability that demand would lie between 55,000ML p.a. and 85,500ML p.a.

This uncertainty reflects the 'lumpiness' of industrial customer demand. Arrival of another large smelter or a steelworks (as an example) might add 10,000ML p.a. to GAWB's demand. If one coal-fired regional generator is replaced by a similar capacity combined cycle gas generator, GAWB's demand may decrease by 5,000ML p.a.

GAWB considers it arbitrary to select a particular future demand as 'correct'.

By contrast, GAWB's approach provides a consistent and equitable method of sharing the costs of spare capacity between current and future users and is consistent with other aspects of GAWB's regulatory and commercial framework.

6.3.3 Recovery of the costs of spare capacity

Bulk water capacity increments are typically large compared to demand growth. That is, it is usually efficient to build large capacity increments that are expensive because of the scale but that provide lower cost water ($/ML) when well utilised. Even though a regulated business initially builds a significant amount of spare capacity, the approach is cheaper in the long run than a series of smaller increments that each have a high $/ML cost.

If a short pricing period were chosen, then the initial price would be very high. Current customers would be paying for **all** the spare capacity put in place for future customers.

It is fair that current customers pay for **some** of the spare capacity – they benefit from the scale of a larger augmentation.

One purpose of setting prices based on anticipated costs and demand over a 20-year period is to promote intergenerational equity between current and future users of the system.

Using GAWB's demand forecast ensures the desired cost sharing is achieved. When existing capacity is well utilised, spare capacity is very small – existing users bear almost all the costs of the existing capacity. When new capacity is constructed there will be a large amount of spare capacity – future users bear almost all the costs of the new capacity.

GAWB is indifferent to this sharing decision. The demand forecast for the 2021–2035 period does not affect GAWB's financial outcomes in a net present value (NPV) sense. A higher demand forecast that included a capacity augmentation would result in a higher price being set now. GAWB would recover more revenue in this period but the revenue carryover into the next period would be lower. GAWB recovers the same NPV of revenues over the life of Awoonga Dam but it would recover more from current customers and less from future customers. Similarly a lower forecast would lead to higher prices (same costs recovered over fewer units of sales). The NPV of GAWB's revenue would remain unchanged.

[60] GAWB, *Strategic Water Plan*, November 2013.

[61] GAWB, *Strategic Water Plan*, November 2013, section 5.

6.3.4 Efficient long-term pricing

In 2010 the Authority recommended a conventional approach whereby:

- expected future demand is forecast; and
- an augmentation is included in the capital expenditure forecast in the year that forecast demand exceeds the capacity of the existing system.

The price to existing customers rises to include recovery of the costs of any augmentations included in the 20-year capital expenditure forecasts.

There is a large amount of uncertainty over future industrial activity in Gladstone. As discussed above, as part of the Strategic Water Plan[62] process a demand forecast was developed based on estimated probabilities of known projects and a statistical analysis of the arrival rate of large industrial customers. This analysis showed that the estimated demand ten years from the forecast date had very large uncertainty: WWL estimated that there was an 80% probability that demand would lie between 55,000ML p.a. and 85,500ML p.a.

As NERA[63] put it in 2009:

> The idiosyncratic nature of the vast proportion of GAWB's future demand means that long term demand forecasting largely amounts to a case-by-case assessment of a small number of individual projects. In such circumstances, there are severe limits on the extent to which the inherent uncertainty of future demand can be reduced.

The augmentation process included in GAWB's contracts provides for GAWB to signal the costs of augmentation at the time that it is required to commit to that augmentation, so that customers can make an informed and efficient decision in response (propose alternative water source projects, reduce their contract quantities, sell back contracted demand, etc.). GAWB contends that it is unreasonable for the Authority to argue that it is efficient to include a speculative capacity augmentation based on a 'single point' demand forecast, without any consideration of the efficient demand responses that might be utilised to defer that augmentation.

NERA further argued[64] that economic efficiency was not served by attempting to accurately forecast demand outside the 5-year regulatory period.

> GAWB's current surplus capacity has been put in place as a means of efficiently supplying expected future demand, and an explicit objective of the 20 year planning period is that those future customers bear some of the costs that would otherwise arise now. This is consistent with the fact that, were some adjustment not to be made, the conventional application of a five year building blocks approach to determining prices would mean that, as the utilisation of GAWB's existing spare capacity increases, the unit cost of supply will otherwise fall.
>
> Such a time-profile of prices would not be consistent with the economic benefits of signalling the increased cost of capacity augmentations as they draw near (through relatively higher prices towards the end of the 20 year planning period), and of signalling the availability of spare capacity in the near terms (and so relatively lower prices towards the beginning of the 20 year planning period).
>
> The corollary of this observation is that it is not a priority for GAWB's demand forecast and any associated expenditure projections to capture the cost of any potential further augmentation in the prices to be determined for the 2011–2015 regulatory period. This is because:
>
> - GAWB's demand projections are highly uncertain, which reflects the lumpy, idiosyncratic nature of the outlook for industrial development in the Gladstone State Development area in particular; and

[62] GAWB, *Strategic Water Plan*, November 2013.

[63] NERA, *QCA 2010 Price Review – Planning Period Demand Forecasts: Gladstone Area Water Board*, November 2009, page 7.

[64] NERA, *QCA 2010 Price Review – Planning Period Demand Forecasts: Gladstone Area Water Board*, November 2009, pages 8–9.

- GAWB also has in place comprehensive arrangements to ensure that all appropriate steps are taken (demand management options, contracts) to ensure that the right augmentation is made at the right time.

It follows that it is neither an achievable nor necessary role for GAWB's demand forecast to give emphasis to the objective of signalling the cost of the next potential augmentation, at least for the 2011–2015 regulatory period. Rather, the primary objective should be for it to achieve price outcomes that recover the cost of existing capacity in an efficient and equitable manner. Indeed, if signalling the availability (or otherwise) of supply capacity was a priority, this would suggest an emphasis on a planning period demand forecast that gave rise to lower prices in the 2011–2015 regulatory period.

6.3.5 Consistency with the CSS

As discussed above, future demand is uncertain. GAWB has consistently argued that current customers should not be required to prepay for speculative future capacity.

Indeed, one purpose of the CSS is to defer construction of new capacity for as long as possible. Deferral allows decisions to be made on the basis of the best information. Moreover, as discussed above, the augmentation process included in GAWB's Water Supply Agreement provides for GAWB to signal the costs of augmentation at the time that GAWB is required to commit to that augmentation, so that customers can make an informed and efficient decision in response (propose alternative water source projects, reduce their contract quantities, sell back contracted demand, etc.).

Under GAWB's approach customers only pay for capacity once the need for that capacity is certain (including after considering efficient demand-side responses based on high-quality estimates of the expected price impact of an augmentation).

The demand forecasting and augmentation capital expenditure roll-in approach that has been previously favoured by the Authority is neither efficient nor consistent with GAWB's commercial framework. Under the Authority's 2010 recommendations, existing customers may be required to pay for both the CSS preparatory expenditure and speculative future augmentations in their price.

6.3.6 Materiality of differences between approaches

As part of the Strategic Water Plan process, GAWB commissioned Wedgewood White Limited to undertake a demand forecast based on estimated probabilities of known projects and a statistical analysis of the arrival rate of large industrial customers.[65]

The 'median' forecast from the SWP complies with the Authority's 2010 recommendation. The modelled 20-year demand was slightly more than 80,000ML. Since that study was undertaken, estimates of the probability of success of several regional projects have decreased. If the study were repeated today the median forecast would be lower. That is, the 20-year demand would likely be very close to the 78,000ML maximum capacity of Awoonga Dam.

The Authority's review process should only seek to modify GAWB's forecasts where the benefits to customers of doing so outweigh the process costs, including some materiality threshold.

GAWB's demand forecast for 2021–2035 is reasonable. It delivers an outcome very similar to the Authority's 2010 recommended methodology (so that price differences between forecasts are unlikely to be material), and GAWB's financial outcomes are not affected by forecast volumes beyond the regulatory period (GAWB has nothing to gain by gaming the forecast).

[65] GAWB, *Strategic Water Plan*, November 2013, section 5.

6.4 Conclusion

6.4.1 Methodology

A reasonable forecaster cannot have confidence that an 'expected demand' forecast for 10 years in the future will be accurate to the nearest 10,000ML. Relying on the spurious accuracy of forecasts can lead to scenarios where augmentation is required. The use of any such forecast that results in existing customers paying for a future augmentation is:

- unfair (the augmentation might never be required and any forecast augmentation required more than 10 years into the future could be described as speculative);
- inconsistent with the CSS (customers pay an insurance premium now to avoid paying for future capacity until the need for that capacity is certain);
- inconsistent with GAWB's Water Supply Agreements (which provide for the price impacts of augmentation to be signalled to customers when the need for augmentation is certain); and
- inefficient (adding capacity augmentation based on a simple demand forecast does not consider potential demand-side responses).

Therefore GAWB's approach to post-2020 demand forecasting:

- recognises that the primary purpose of the 20-year planning period is to share the cost of spare capacity between current and future users;
- is consistent with the Authority's objectives when establishing the 20-year planning period; and
- is consistent with GAWB's Water Supply Agreements and the CSS.

The question of the most appropriate planning period demand forecast to achieve the objective of balancing the interests of current and future customers, as manifested in the time profile of prices paid by those customers, should be addressed by referencing the original objectives cited by the Authority in establishing a 20-year planning period. Those objectives included a number of potential roles for the pricing element of the 20-year planning period:

- revenue adequacy;
- signalling the long run marginal cost of supply; and
- incorporating the cost of efficient spare capacity into the price for current and future customers.

All of these objectives would be assisted by adopting a planning period demand forecast that, in aggregate, assumed that the entire amount of GAWB's current surplus capacity was used by the end of the planning period.

GAWB engaged HoustonKemp to review the demand forecasting methodology. HoustonKemp's report in included as Appendix I. HoustonKemp states:[66]

> We have assessed this methodology by reference to principles identified by the QCA. In our opinion, it is more appropriate than the alternative of adopting a considered forecast of year-by-year customer demand, because:
> - future demand for water supplied by GAWB is so uncertain that a best estimate approach adds no insight as compared with the projection method proposed by GAWB;
> - the significant uncertainties and idiosyncrasies associated with future demand mean that revenue adequacy offers much more practical guidance to the time profile of prices than any estimate of long run marginal cost;
> - the principal function of GAWB's planning period demand forecast is therefore to apportion the cost of its existing, surplus (but efficient) capacity between present and future customers; and

[66] HoustonKemp, *Methodology for Forecasting Demand*, September 2014, page 7.

- GAWB's proposed approach best serves the objective of smoothing the cost of the existing surplus capacity, so that current customers do not bear that cost to a disproportionate extent.

6.4.2 Outcomes

GAWB's forecast of annual volume of sales is set out in Figure 12 and Figure 13. GAWB's forecast of customer MDQs is set out in Figure 14.

Figure 12: Forecast annual contract volume by product

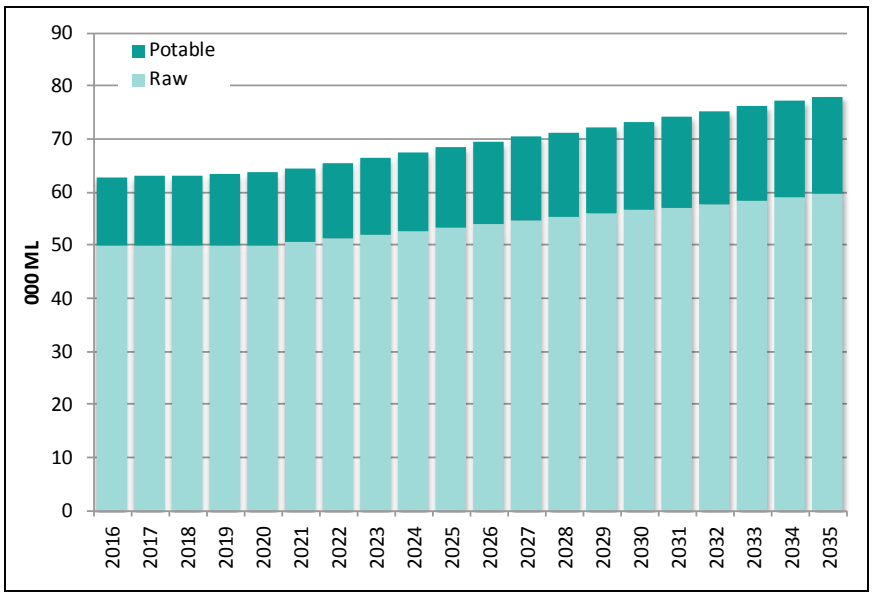
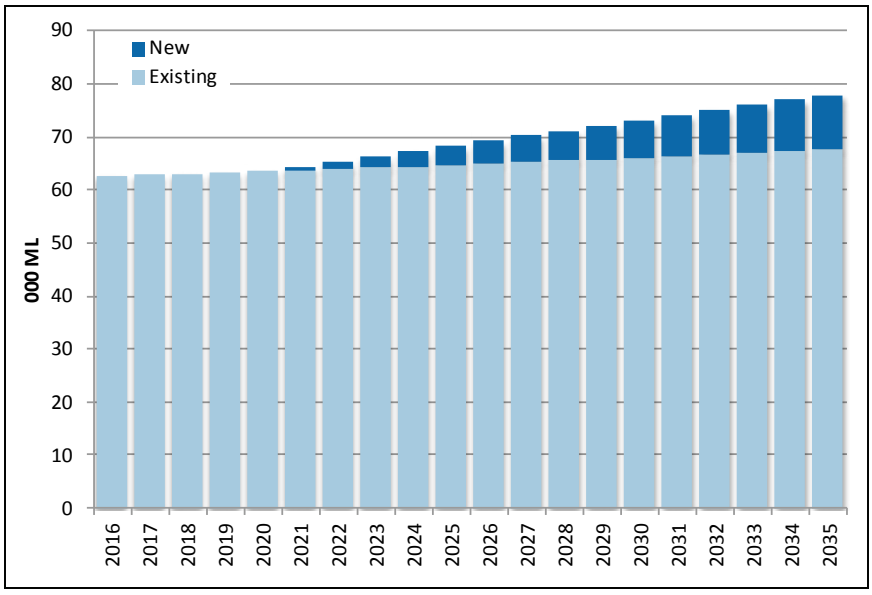
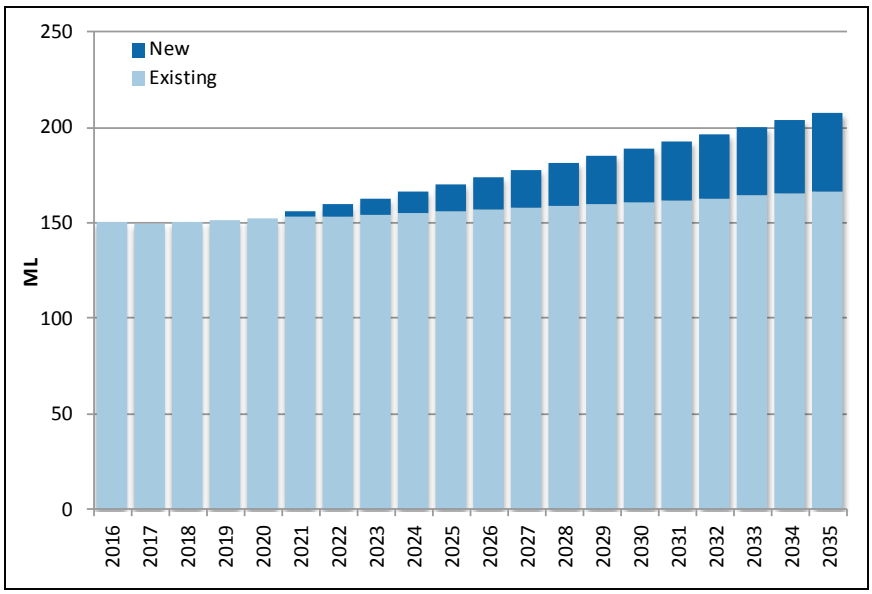


Figure 13: Forecast annual contract volume from new and existing customers



GAWB has assumed that all 'unknown future customer' demand would occur in the North Industrial zones and that 93% of demand is for raw water and 7% of demand is for potable water (which matches the historic mix of demand for industrial customers). Both of these assumptions are unchanged from the 2010 demand forecast.

Figure 14: Forecast MDQ from new and existing customers



7 Weighted Average Cost of Capital

The Authority is currently undertaking a review of its WACC) calculation methodology but has yet to publish its benchmark WACC for GAWB. In the absence of this benchmark, GAWB is unable to make substantive submissions on WACC. GAWB understands that the parameters upon which the benchmark WACC will be determined by the Authority will be published in the near future. GAWB will make its detailed submissions on WACC within a reasonable time from the date the Authority publishes its benchmark WACC.

For the purpose of providing indicative pricing, GAWB has calculated an indicative cost of capital for the 2016–2020 regulatory period of 6.85%, which is significantly lower than the rate used to set prices for the current regulatory period.

The indicative WACC has been determined with reference to the current WACC methodology, varied to:

- **take into account the Authority's recent benchmark WACC position paper for south east Queensland (SEQ) water retailers; and**
- **facilitate the introduction of a trailing average cost of debt (and consequential change to the term to maturity of the risk-free rate proxy from 5 years to 10 years).**

The benefits of including a trailing average cost of debt in the WACC calculation are that:

- **GAWB can adopt more usual debt portfolio refinancing practices (refinancing 10% of its debt requirements each year, rather than attempting to refinance the entire portfolio over a few weeks at every price review); and**
- **prices will be more stable over time.**

The trailing average cost of debt has been adopted by the AER and is supported by QTC.

7.1 General approach to estimating WACC

GAWB's pricing practices set prices such that GAWB earns a target rate of return on investment equal to its WACC. Therefore estimating GAWB's WACC is an important component of price setting.

The Authority is currently undertaking a review of its approach to estimating the WACC of regulated entities, including a decision regarding use of a trailing average cost of debt. However, the results of that review will not be known until early 2015.

The Referral Notice states that:

> in respect of the return on capital [the Authority is to] consider the WACC applied by GAWB against the benchmark WACC.

The Authority has not published a benchmark WACC for GAWB, but has published a benchmark WACC for SEQ water retailers.

In the absence of the outcomes of the Authority's WACC review and benchmark WACC for GAWB, for the purposes of providing indicative prices for this submission, GAWB has undertaken a simple 'parameter update' of the Authority's 2010 WACC calculation, but with:

- changes in the Authority's preferences for industry wide components (market risk premium and gamma) set out in the Authority's August 2014 *Long-term framework for SEQ water retailers – weighted average cost of capital (WACC)* position paper;
- a trailing average cost of debt mechanism; and
- a risk-free rate based on the yield of a Commonwealth Government bond with a term to maturity of 10 years.

7.2 Proxy for risk-free rate

The risk-free rate is a component of both the cost of equity and the cost of debt. The risk-free rate is the rate of return required by investors for holding an asset with zero default risk.

General regulatory practice in Australia is to accept the rate on Commonwealth Government bonds as the best proxy for a riskless asset (it is a very low risk asset with observable price related to expected returns).

Typical Australian regulatory practice is to adopt a risk-free rate based on the yield of a Commonwealth Government bond with a term to maturity of 10-years. This approach is currently used by the Essential Services Commission (ESC), IPART, Essential Services Commission of South Australia (ESCoSA) and Australian Competition and Consumer Commission (ACCC)/AER.

GAWB has used this approach for the purpose of determining its indicative WACC for pricing purposes.

7.3 Trailing average cost of debt

7.3.1 GAWB's approach

GAWB's return on investment is comprised of two components:

- return on equity; and
- return on debt.

The return on debt has traditionally been set for five years based on the prevailing market conditions at the time of a price review (the 'on the day' approach).

The 'on the day' approach has several problems. Most significantly for the regulated business, it is difficult to replicate the outcome of the regulatory decision – requiring all debt to be raised over the period of a few days.

Most significantly for customers, the 'on the day' approach can lead to dramatic price volatility because the cost of debt can change significantly between one five-yearly price review and the next. The change in market conditions between the 'on the day' assessments of WACC in 2005 and 2010 resulted in price increases of around 40% all else being equal. Similarly, the change in market conditions between the 'on the day' assessments of WACC in 2010 and 2015 will result in price decreases of around 20%, all else being equal.

An alternative approach is a 'trailing average' cost of debt. GAWB's indicative WACC has utilised this 'trailing average' approach. Under this approach, the cost of debt would be based on the firm notionally rolling over a portion of its long-term debt each year. This approach is aligned with debt management practices of unregulated firms.

The benefits of this approach are that:

- GAWB can adopt more usual debt portfolio refinancing practices (refinancing 10% of its debt requirements each year, rather than attempting to refinance the entire portfolio over a few weeks at every price review); and
- prices will be more stable over time.

The Authority is currently undertaking a WACC review, including considering adopting a trailing cost of debt. GAWB understands that the Authority's final position on adopting a trailing average cost of debt will be released in early 2015.

In its joint response (with Queensland Urban Utilities and Unitywater) to the Authority's 'Split Cost of Capital' discussion paper, GAWB supported the introduction of a 10-year trailing cost of debt.

Moreover, the AER has recently confirmed that it will adopt a trailing average cost of debt in future determinations for electricity and gas networks. Given the number of networks regulated by the AER and the AER's influence amongst Australian regulators, GAWB expects that a trailing average cost of debt methodology will quickly become the usual approach.

The trailing average approach is likely to be a key factor in consideration of GAWB's WACC submissions once the benchmark WACC is known. Any proposal by GAWB to include a 10-year trailing average cost of debt would incorporate:

- a simple spreadsheet model to updated target revenue requirement for actual costs of debt (including recalculating tax cash flows);
- prices are updated at each price review (rather than annually) for annual cost of debt adjustments; and
- the net present value of cost differences (between the forecast cost of debt and outcome cost of debt) would be rolled-forward to the start of the regulatory period as a building block and included in the tariff calculation (i.e. treated in the same way as the current price smoothing carryover).

7.4 WACC estimate

GAWB's current indicative estimate of WACC is 6.85%. Table 27 sets out GAWB's current WACC estimate and compares that to the WACC estimate used to set prices in 2010.

Table 27: Comparison of GAWB's current WACC estimate with the 2010 estimate

	GAWB's adopted 2010 WACC based on the Authority's 2010 Final Report	Synergies Update based on the Authority's SEQ Benchmark Report and 10-year risk-free rate	Comments on update data source
Data date	30 June 2010	31 July 2014	
Risk Free Rate (Rf)	*5.04%*	*3.53%*	*Note 1*
Debt Risk Premium	*3.64%*	*2.34%*	*Note 2*
Debt Raising Costs	*0.125%*	*0.108%*	*Note 3*
Refinancing Costs	*0.98%*	*N/A*	*Note 4*
Debt Margin (Kd – Rf)	4.74%	2.45%	
Market Risk Premium (Km – Rf)	*6.0%*	*6.5%*	*Note 3*
Asset Beta (Ba)	*0.4*	*0.4*	*Note 5*
Debt to Value (L)	*50%*	*50%*	*Note 5*
Statutory Tax Rate (Tc)	*30%*	*30%*	
Value of Imputation (Gamma)	*0.50*	*0.47*	*Note 3*
Equity Beta (Be)	0.65	0.64	
Debt Beta (Bd)	*0.11*	*0.11*	*Notes 3 & 5*
Effective Tax Rate (Te)	0.15	0.16	
Expected Return on Equity (Ke)	8.92%	7.72%	
Expected Return on Debt (Kd)	9.78%	5.98%	
Estimated Post-Tax Nominal WACC	**9.35%**	**6.85%**	

Notes:
1 Market parameter update – 20 day average of 10 year Commonwealth Govt.
2 Market parameter update – 20 day average of RBA 10 year BBB
3 Queensland Competition Authority SEQ water retailers benchmark WACC report
4 Refinancing cost allowance not required if 10-year risk-free rate adopted
5 Queensland Competition Authority 2010 GAWB WACC recommendation

Actual prices for 2016 will be set based on GAWB's WACC methodology and parameter updates in June 2015. Those prices will differ from those presented in this submission due to changes in GAWB's estimate of its WACC.

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8 Price structure

This section sets out GAWB's intended pricing structure for the 2016–2020 regulatory period.

GAWB will make minor changes to pricing zones, consistent with changes to the physical delivery infrastructure associated with construction of the water supply to Curtis Island.

GAWB's price structure has remained unchanged since 2002. However, GAWB has signalled a desire to change the pricing arrangements for the delivery network since 2005.

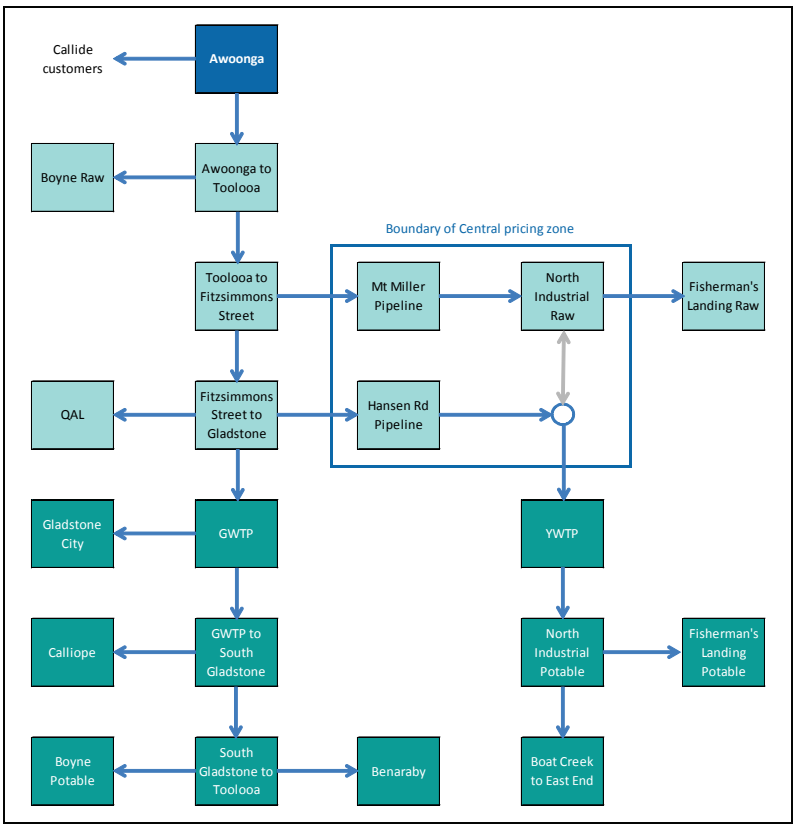
GAWB intends to change the basis of pricing for the delivery network from annual quantities to MDQs. GAWB will transition to an MDQ-based delivery pricing from 2016.

GAWB will support customers to understand the new pricing arrangements and select an appropriate contract MDQ at each connection point. GAWB will apply a comprehensive suite of measures to protect customers during a five-year transition to MDQ-based delivery pricing.

8.1 Pricing zones

The 2011–2015 regulatory period pricing zones are set out in Figure 15.

Figure 15: 2011–2015 regulatory period pricing zones

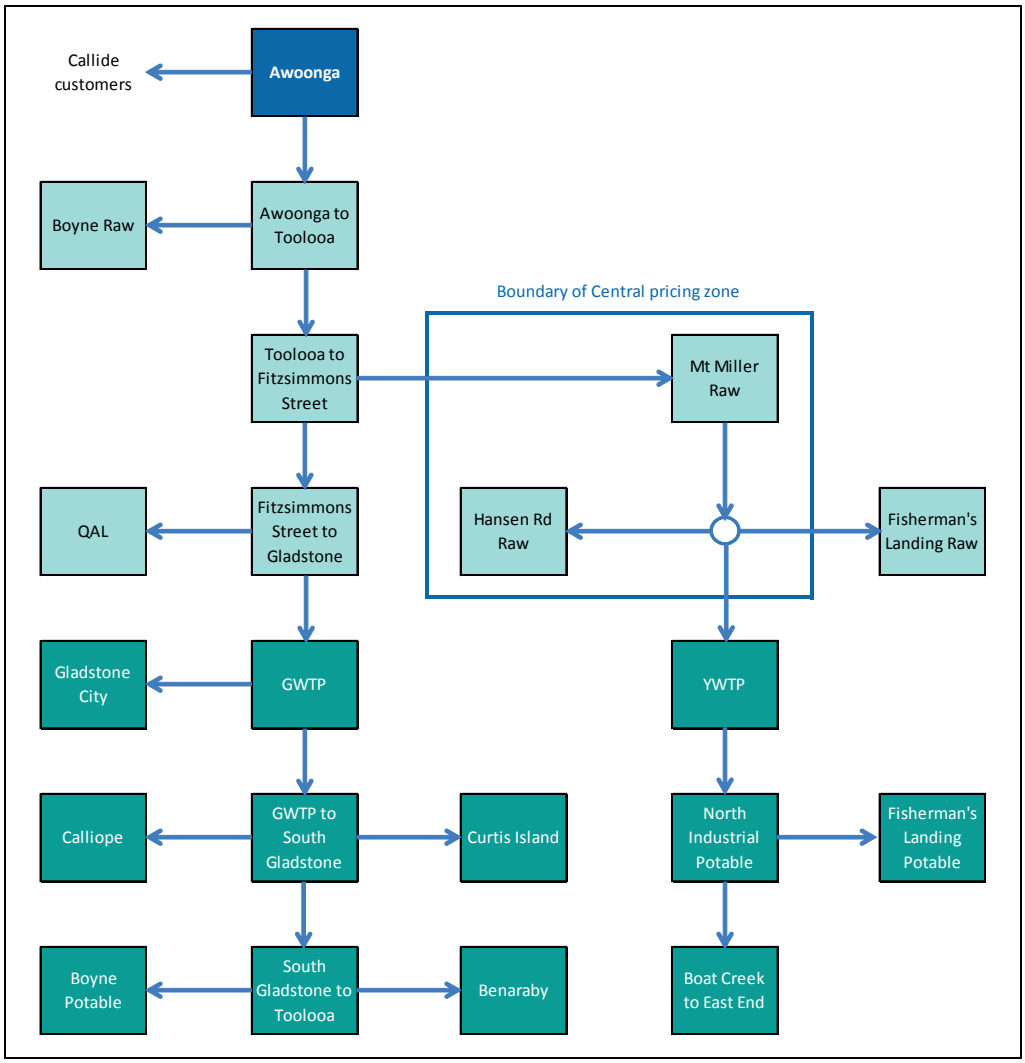


GAWB will make minor changes to the pricing zones adopted in the 2011–2015 regulatory period pricing zones for the next regulatory period, as discussed below. The 2011–2015 regulatory period pricing zones are set out in Figure 16.

The North Industrial Raw pricing zone consists of a short run of pipes (RAB value less than $1.2 million) in the North Industrial area connecting the Mt Miller Pipeline to the Fisherman's Landing pricing zone, YWTP and the Hansen Rd Pipeline. The zone was priced to be the same as the Mt Miller Pipeline (as part of the Central price zone). No purpose is served by maintaining separate North Industrial Raw and Mt Miller Pipeline zones. GAWB therefore intends to combine these pricing zones as the 'Mt Miller Raw' pricing zone.

During the 2011–2015 regulatory period, a potable water supply to Curtis Island was constructed. This project involved converting part of the Hansen Rd pipeline from raw to potable use. The existing raw water connections on Hansen Rd pipeline are now fed from the Mt Miller pipeline rather than from the Fitzsimons St to Gladstone pricing zone.

Figure 16: 2016–2020 regulatory period pricing zones



8.2 Flow-based delivery network pricing

GAWB's price structure has remained unchanged since 2002. However, GAWB has signalled a desire to change the pricing arrangements for the delivery network since 2005. In submissions to both the 2005 and 2010 price reviews, GAWB argued that pricing use of the delivery network based on annual quantities are less efficient and less equitable. GAWB has consistently submitted that pricing for the use of the delivery system should include a flow-based component.

GAWB intends to transition to MDQ-based delivery charging from 1 July 2015.

8.2.1 Rationale

As previously argued by GAWB in submissions to the Authority, customers' contracted annual volumes are a poor proxy for customers' use of delivery assets.

Consider an asset designed to supply two customers. Customer A operates 24 hours per day, 7 days per week (except for a short annual maintenance shutdown). Customer B operates 8 hours per day on 200 working days per annum. Both customers consume 1000ML per annum.

The contract quantities for the two customers are set out in Table 28:

Table 28: Example customer usage comparison

	Annual contract quantity ML	Maximum daily quantity ML	Maximum instantaneous flow L/s
Customer A	1,000	3.0	35
Customer B	1,000	5.5	200

Under the current annual contract quantity delivery pricing arrangements, these two customers would see the same total charge.

However Customer B requires GAWB to reserve almost twice as much upstream network capacity as Customer A. The network upstream of the last network storage (pumps, pipelines and storages) must be sized to meet Customer B's MDQ requirements.

Moreover Customer B requires GAWB to reserve almost six times as much downstream network capacity as Customer A. The downstream network (equipment downstream of the last network storage) must be sized to meet Customer B's maximum instantaneous flow requirements.

That is, the amount of existing network capacity that must be reserved for a customer is related to the customer's MDQ and instantaneous flow rate (IFR), not its annual volume. Moreover the requirement to put in place additional capacity is related to the additional MDQ and IFR required to be serviced by the network, not the additional annual volume.

8.2.2 Cost reflective volumetric charge

GAWB's current delivery charges comprise both volumetric and access components. This section discusses a more cost reflective Volumetric Charge.

The Volumetric Charge is set to achieve economic efficiency. That is, the Volumetric Charge is required to reflect the long-run marginal cost (LRMC) of consumption. The LRMC has two components:

- variable operating costs; and
- the marginal cost of capacity.

Variable operating costs (electricity for pumping and chemicals for water treatment) are largely related to total volume of water supplied. The most cost reflective way to recover these variable operating costs is to retain the current volume basis.

The LRMC of capacity is influenced by changes in MDQ and/or IFR. The dominant cost driver and the magnitude of the marginal costs (in $ per ML MDQ or $ per L/s IFR) will vary geographically and over time. As most of the value of the network (and likely future network augmentations) is upstream of the last storage, the most appropriate method to signal the LRMC of capacity is **metered monthly MDQ**.

8.2.3 Cost reflective access charge

The Access Charge recovers the remaining portion of GAWB's allowed revenue. The primary tariff design guidance of the Access Charge is to recover the target revenue in the most equitable/fair way (subject to the constraint that the Access Charge should not influence consumption decisions).

While a cost reflective recovery of network costs could include an MDQ component, an IFR component, and/or a component unrelated to capacity,[67] the dominant component is MDQ-related. That is, MDQ-related costs represent the largest proportion of network costs.

As GAWB's costs are essentially unrelated to annual volumes, the change to charging the access component on the basis of **contract MDQ** is considered to be more equitable for all customers.

8.2.4 Overrun charges

GAWB is currently permitted to charge 'overrun' charges where customers exceed the contracted annual quantity. The overrun charge serves two functions:

- it provides an incentive for customers to accurately specify their required capacity; and
- recovers the costs of overruns.

The move to MDQ-based delivery charges will require a change to how the overrun charges are applied to delivery network overruns. To assist with the transition to MDQ-based delivery charges, GAWB intends to waive all overrun charges for MDQ-based delivery in the 2016–2020 regulatory period (section 8.2.6).

The remainder of this section outlines the proposed MDQ-based delivery overrun charges that would apply post-2020.

The 2010 Authority recommendation for overrun charges, currently based on annual quantities, is set out below.

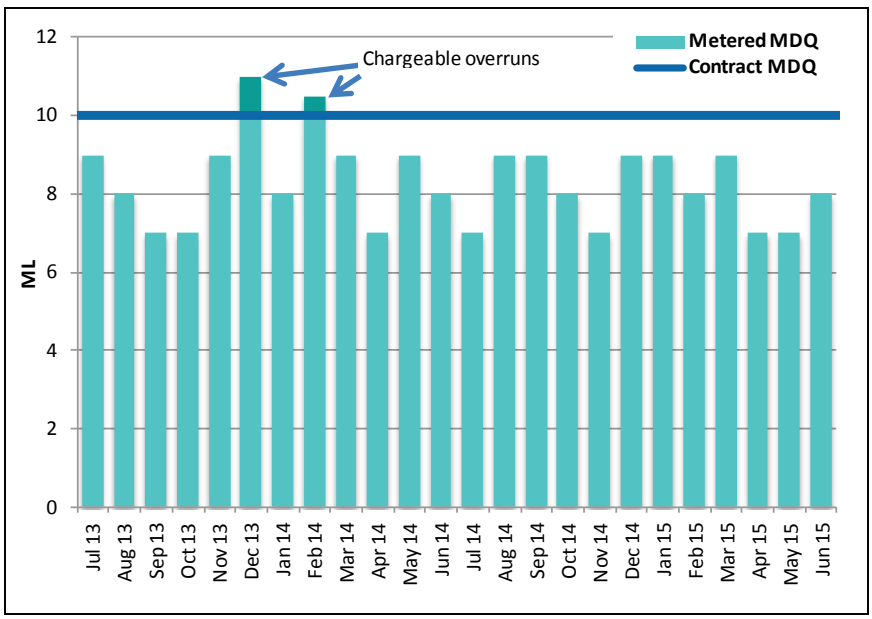
> The Authority recommends that GAWB retain the current methodology for determining over-run or penalty charges where:
>
> (a) actual demand exceeds the contracted/reservation volume for industrial customers, unless otherwise negotiated with GAWB, an additional load factor or surcharge of:
>
> (i) 25% applies to the total charge for incremental volumes where actual consumption is between 110% and 125% of the contracted amount (first over-run charge); and
>
> (ii) 50% applies to the total charge for incremental volumes where actual consumption is higher than 125% of the contracted amount (second over-run charge); and

[67] Some costs would be incurred for any capacity of supply (or, more correctly, there is a cost component that is independent of the capacity of the network that is established). For example, design, consenting, land acquisition costs and road opening and reinstatement costs do not vary greatly with capacity. There is also a capacity-dependent component of costs: bigger pumps, bigger reservoirs and larger diameter pipes are more expensive than lower-capacity pumps, reservoirs and pipes. However these costs do not necessarily vary linearly with volume.

(b) actual demand exceeds the contracted/reservation volume for Local Government Authority customers, unless otherwise negotiated with GAWB, a load factor or surcharge of 10% will apply to the total charge for incremental volumes where actual consumption exceeds 125% of the contracted volume.

MDQ-based delivery charges are determined monthly based on the contracted MDQ. In months where the actual MDQ exceeds the contracted MDQ, the customer would be required to pay an overrun charge on the difference between the actual and contracted MDQs. To ensure that customers have a financial incentive to reserve the expected annual MDQ, the overrun charge will be set at 12 times the monthly MDQ overrun.

Figure 17: Proposed overrun charge basis (to apply post-2020)



While this structure is somewhat different to the current overrun structure, the approach is consistent with the objectives of the current overrun charge provisions. The following summarises the key aspects of the new arrangements:

- Setting the overrun charge at 12 times the monthly charge is roughly equivalent to an annual charge (for the first month of overrun). This simply triggers a charge equal to that which would have been paid if the customer had specified the higher MDQ in their contract. (i.e. the customer is not penalised).
- Whilst there is no 10% overrun allowance, the mechanism is similar in that, in effect, the first overrun in a year is penalty free. Thereafter, the more frequently the customer overruns its contracted MDQ, the higher the effective annual charge.

8.2.5 Consultation with customers

Over the past two years, GAWB has been analysing customer MDQs. GAWB has met with customers to discuss MDQ pricing and has provided customers with 'shadow bills' illustrating how a change to MDQ pricing would affect each of the customer's connection points.

GAWB will continue to engage with customers to help them understand MDQ and specify an appropriate contract MDQ post 1 July 2015.

8.2.6 Customer protection during transition

GAWB intends to implement four mechanisms to protect customers during a five-year transition to MDQ-based tariffs:

- grandfathered annual quantity tariff;
- ability for customers to re-specify MDQs;
- no over-run charges for five years; and
- a revenue cap form of regulation.

Each of these customer protection mechanisms is discussed below.

Grandfathered annual quantity tariff

As discussed above, one of the primary reasons for adopting MDQ-based delivery charge is customer equity. However, notwithstanding that GAWB has signalled a change to flow-based pricing for a decade, it is not consistent with customer equity to impose large bill changes on customers overnight. Therefore, GAWB intends to retain the annual quantity delivery charge for the next five years.

Under the transition, GAWB will charge customers the lesser of the MDQ-based delivery charge and the grandfathered volume-based delivery charge. The intended transition process is that customers will be billed as set out in Table 29.

Table 29: Transition to MDQ-based delivery charges

Year	Charge
2016	Lesser of the MDQ-based charge and 110% of the volume-based charge
2017	Lesser of the MDQ-based charge and 120% of the volume-based charge
2018	Lesser of the MDQ-based charge and 140% of the volume-based charge
2019	Lesser of the MDQ-based charge and 160% of the volume-based charge
2020	Lesser of the MDQ-based charge and 180% of the volume-based charge

Under this transition arrangement customers with low cost demand profiles (customers that use water consistently throughout the month and year) will immediately receive lower bills. Customers with high cost demand profiles (customers with demand peaks) will transition to higher bills over time unless they can change their demand profiles.

Ability to modify contracted MDQ

The current ‘delivery access charge’ and planned ‘delivery MDQ charge’ (i.e. contract MDQ charge) are based on contract quantities. GAWB’s commercial framework is based on long-term contracts with customers. Customers have limited ability to change contract quantities over time. However, because MDQ-based pricing is new to customers, GAWB intends to allow customers to modify their contracted MDQ during the next regulatory period.

If a customer over-specifies its MDQ or makes operational changes to reduce its MDQ, GAWB will allow the customer to reduce its contracted MDQ.

Similarly, if a customer under-specifies its MDQ, GAWB will allow the customer to increase its contracted MDQ rather than pay the overrun charges that would normally be associated with overrunning contract quantities.

No overrun charges for five years

As discussed above, GAWB intends to allow customers to increase their contracted MDQ throughout the 2016–2020 regulatory period, rather than pay the overrun charges that would normally be associated with overrunning contract quantities.

A customer would remain liable for damages for a loss caused by an unauthorised overrun as set out in GAWB's Water Supply Agreements.

Revenue cap form of regulation

Adopting a new charging basis and providing transition arrangements create revenue recovery risk for GAWB. It will be difficult for GAWB to estimate the rate at which customers will change their behaviour to minimise MDQ-based delivery charges. GAWB therefore plans to apply a revenue cap for delivery access charges for existing customers (irrespective of its wider position on the hybrid revenue cap). A revenue cap on existing customers mirrors the effect of the current long-term volume contract quantities and does not affect GAWB's incentive to connect new customers.

GAWB's ability to provide the other customer protection arrangements (and indeed GAWB's ability to adopt MDQ pricing) is dependent on putting in place a revenue cap for delivery access charges for existing customers for the 2016–2020 period.

8.2.7 Other pricing policies

Small connections

Where the cost of installing flow-metering capability outweighs the benefits to the system of accurately recording flows (small connections with low flow capability), GAWB will estimate the MDQ for billing purposes based on actual consumption and typical demand profiles.

Catch-up demand

Where a customer has faced an outage caused by a GAWB network failure, the customer will be permitted to refill its storages at a rate exceeding its MDQ (if necessary) without penalty. That is, GAWB will charge the customer based on the average rate of water use over the time covering both the outage and refill period. Some coordination between customers may be required and GAWB will work with customers to manage the system after supply restoration.

Connections under GAWB control

The flow rate at some connections is under GAWB's control – not the customer's control. In these circumstances GAWB typically manages flows to deliver the customer's target reservoir storage levels while minimising GAWB's pumping costs.

Where flow rates are under GAWB's control, the price at that connection will be based on the maximum average three-day flow.

This is because GAWB can control the flow over one day, the average flow over multiple days is a function of the underlying demand characteristics. Put another way, using the maximum average three-day flow gives the same outcome as GAWB optimally managing daily flows (and therefore MDQ) with perfect foresight over the daily demands.

A three-day average was chosen to reflect typical operating capacities of reservoirs. It is unusual for customer reservoirs to have flexibility to store more than two days' supply (in addition to the desired risk storage capacity).

8.2.8 Charge names

Table 30 shows GAWB's current charge names and GAWB's revised charge names under MDQ-based delivery charging, noting that the current Delivery Volumetric Charge will be split into two charges as outlined above.

Table 30: Changes to charge names

	Current Charge Name	Revised Charge Name
Reservation and Storage	Storage Access Charge	Storage Access Charge
	Storage Volumetric Charge	Storage Volumetric Charge
	Overrun Charge	Storage Overrun Charge
Delivery	Delivery Access Charge	Delivery MDQ Charge (i.e. contract MDQ)
	Delivery Volumetric Charge	Delivery Metered MDQ Charge (i.e. metered monthly MDQ)
		Delivery Volumetric Charge
	Overrun Charge	Delivery Overrun Charge
Administration	Administration Charge	Administration Charge

8.3 Price differentiation for service quality

8.3.1 Current pricing principle and application

GAWB will differentiate prices to reflect service quality to the extent that this involves cost differentials. In relation to new water sources, the Authority recommended that GAWB should continue to monitor customer demand for the scope for water supply products to be differentiated on the basis or reliability, including an 'opt-in/opt-out' approach where additional supply can be provided from new sources.

GAWB did not support the approach taken by the Authority in relation to the 'opt-in/opt-out' approach in its submissions to the Authority.

8.3.2 Discussion

GAWB will consult with customers regarding provision of target levels of network risk storage. There may be scope for customers to 'opt-in' or 'opt-out' of a particular level of network risk storage, when all customers in a zone agree to a common approach.

However, GAWB continues to believe that an 'opt-in/opt-out' approach for water sources is not consistent with the commercial framework and not suitable for a network business where all connected customers have common source security.

8.3.3 GAWB approach

GAWB plans:

- no changes to the principle that GAWB can differentiate prices to reflect the costs of differentiated service quality; and
- pricing principles reflect that an 'opt-in/opt-out' approach for water sources is not consistent with the commercial framework and not suitable for a network business where all connected customers have common source security.

8.4 Price differentiation for contract length

8.4.1 Current pricing principle and application

At the 2010 price review, GAWB successfully argued for the introduction of price differentiation for customers with short-duration contracts. A short-duration contract is a contract with an original term of less than 20 years.

GAWB has identified two ambiguities with the Authority's 2010 recommendation. In the interests of transparency GAWB highlights these matters and outlines the revisions that it will make.

8.4.2 Discussion

The Authority's 2010 recommendation states:

The Authority recommends that a premium of 25% be applied to contracts of two years or less, 20% for contracts of two to five years, 10% for contracts of five to 10 years, 5% for contracts of 10 to 15 years, and 3% for contracts of 15 to 20 years be applied.

Additional revenues from surcharges should be used to offset charges for contracts of 20 years or more, subject to charges to any customer at least covering GAWB's operating cost of servicing that customer.

For the current regulatory period, GAWB has applied these pricing principles to each customer, A more defined interpretation would see the principle 'applied to contracts' to mean the contract for supply at a particular connection. That is, if a long-term customer requests a short-term connection at a new location, the price at that connection will include the short-duration contract surcharge.

The Authority's recommendation requires GAWB to use surcharge revenue to "offset charges for contracts of 20 years or more". GAWB will include the sum of short-duration contract surcharges (net of GAWB costs, if any) from one regulatory period as an Awoonga zone building block in the price calculation for the next period. This approach will reduce the Reservation and Storage Contract Volume Charge to all customers (including customers on short-duration contracts). However, because short-duration contracts amount to less than 1% of revenue, more than 99% of short-duration contract revenue is returned to long-term customers. The price differentiation surcharge amount to be returned to customers (and taken into account in the indicative prices for the next regulatory period) is in the order of $0.678 million.

8.4.3 Conclusion

GAWB requests that the Authority endorse two clarifications to the short-duration contract surcharge arrangements:

- that surcharges should apply on a per connection basis (that is, if a long-term customer requests a short-term connection at a new location, the price at that connection would include the short-duration contract surcharge); and
- that the sum of short-duration contract surcharges (net of GAWB costs, if any) from one regulatory period be included as a building block in the price calculation for the next period.

8.4.4 GAWB's pricing principles

GAWB's standard terms and conditions for the supply of water services include provisions that oblige GAWB to comply with the outcome of the prior investigation by the Authority into its pricing practices. These provisions are summarised in a schedule to the water supply agreements entitled 'Pricing Principles' and are intended to be updated from time to time.

Attached as Appendix B to this document is a mark-up showing the changes that GAWB plans to make to these Pricing Principles with effect from 1 July 2015.

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9 Planned changes to regulatory framework

This section sets out GAWB's planned changes to its regulatory framework. The 'Pricing Principles' schedule to the water supply agreements will be amended to reflect these changes (refer Appendix B).

GAWB plans to employ:

- **a hybrid price/revenue cap for the reservation and storage service; and**
- **a revenue cap for the delivery network for *this regulatory period only* to facilitate the transition to MDQ-based delivery pricing.**

9.1 Form of regulation

9.1.1 Current pricing principle and application

GAWB currently operates under a price cap form of regulation. Under this form of regulation, prices are set for five years. Under the price cap:

- GAWB benefits from any additional demand (through receiving higher-than-expected revenue) over the forecast demand used to determine customer prices for a regulatory period; and
- GAWB is disadvantaged if forecast demand used to determine customer prices does not materialise (through receiving lower-than-expected revenue).

The aim of the price cap is to provide:

- incentives for GAWB to efficiently mitigate volume risk through tariff structures and contractual arrangements;
- incentives for GAWB to seek additional demand and facilitate new connections and retain existing customers (because additional demand results in additional revenue – and profit – for the business); and
- price stability for customers over the five-year regulatory period.

By way of comparison, under a revenue cap form of regulation, a regulated business is guaranteed a particular level of revenue. Prices are charged (either annually or at each price review) to ensure that the business recovers a target level of revenue (in NPV terms). The business is therefore indifferent to growth in demand. In some cases the business's profit may be higher when customers leave the system (or do not join at the rate forecast).

During the 2006–2010 regulatory period demand was significantly lower than forecast and GAWB under-recovered its target revenue. During the 2011–2015 regulatory period, GAWB will over-recover target revenue as a result of demand being higher than forecast.

9.1.2 Previous submissions

GAWB had previously made submissions to the Authority at the 2005 and 2010 Price Reviews that a revenue cap is a more appropriate form of regulation.

GAWB cannot mitigate the risk of future forecast demand not materialising. As this is a risk that GAWB cannot control, GAWB contends it is one that it should not bear.

9.1.3 Background

While GAWB has benefited in the current regulatory period from the price cap form of regulation, GAWB remains of the view that a pure price cap is not an appropriate form of regulation for GAWB.

GAWB acknowledges that its previous submissions on a revenue cap form of regulation have been unsuccessful. In its Final Report for the 2010 Price Review the Authority noted that the price cap form of regulation applied to other Australian water business. However, there has been a significant shift away from pure price caps both for water businesses and other regulated entities. Relevant decisions are discussed below.

In 2008 ICRC adopted a hybrid price/revenue cap, with individual price caps developed for water and sewerage services. This mechanism applies if revenues are more than 3% different from the forecast across the first four years of the regulatory period. That is, if the deviation between the actual and forecast demand exceeds 3%, then an adjustment is made at the commencement of the next regulatory period allowing recovery of the present value of over or under-recovery in excess of the threshold. The ICRC considered that a wider dead band of 10% would mean an excessive level of risk being faced by ACTEW Corporation.

In 2012 IPART adopted a hybrid price/revenue cap, with individual price caps developed for water services and a demand volatility adjustment mechanism used to provide Sydney Water with protection against significant deviations between actual and forecast demand. Under this mechanism, if the deviation between the actual and forecast demand exceeds 10%, then an adjustment may[68] be made at the commencement of the next regulatory period, for any over-recovery or under-recovery in excess of the threshold.

In 2013 the ESC allowed the metropolitan water businesses to choose whether to adopt a price or revenue cap. Yarra Valley Water chose a revenue cap. The ESC also made provision for the price cap businesses to apply for an amendment to their determinations if there is a material difference between forecast demand and actual demand in one or more regulatory years. Under this re-opener mechanism, the ESC can decide whether to allow the amendment in the period or in the next regulatory period.

Also in 2013 ESCOSA adopted a hybrid average revenue/revenue cap for SA Water. Under this mechanism, if the deviation between the actual and forecast revenue exceeds 1% (in aggregate over the regulatory period), then an adjustment will be made at the commencement of the next regulatory period, for 30% of any over-recovery or under-recovery in excess of the threshold.

In the National Electricity Market, the AER must apply revenue caps for electricity transmission businesses. The AER can choose the form of regulation for electricity distribution businesses. A mix of price and revenue caps is currently in place but the AER has expressed a preference to move to a revenue cap form of regulation for all businesses.[69]

In 2010, the Authority stated that it would work with GAWB to develop a mutually acceptable form of regulation. Based on the Authority's responses to GAWB's previous submissions, GAWB believes that a mutually acceptable form of regulation for GAWB would be one where:

- GAWB is incentivised to facilitate connection of new customers (which is a key aspect of the price cap form of regulation); and
- GAWB can limit down-side revenue exposure if forecast demand does not materialise; and
- customers retain five-year price certainty.

[68] The term 'may' is used because IPART considers that it is unable to bind its future decisions.

[69] See AER response to Productivity Commission further information request, 23 February 2013

A hybrid price/revenue cap form of regulation would meet these requirements. A move away from a pure price cap form of regulation now has significant regulatory precedent in both the water industry and regulated utilities generally.

9.1.4 Hybrid approach

GAWB plans to employ a hybrid price/revenue cap similar to that approved by ICRC for ACTEW and IPART for Sydney Water. In particular GAWB intends to:

- implement a symmetrical 5% threshold for triggering the revenue cap; and
- roll-forward differences between actual and forecast revenue in excess of the 5% threshold (with balances earning/paying interest at the WACC for that year) to the beginning of the next regulatory period.

Under this approach:

- GAWB retains revenue from additional demand up to 5% over that forecast – meeting Authority's requirement for an incentive to facilitate retention of demand and connection of additional demand;
- customers bear the risk of demand outcomes being more than 5% below that forecast – meeting GAWB's requirement to effectively cap the down-side exposure to demand; and
- no changes are made to prices within period other than CPI indexing (unless a review trigger is reached) – meeting the Authority's requirement for price stability.

9.1.5 Temporary delivery network revenue cap

Whilst GAWB considers that a hybrid price/revenue cap is a candidate for the long-term form of regulation for GAWB, the transition to MDQ-based delivery pricing requires the adoption of a revenue cap for the delivery network for existing customers and for **this regulatory period only**.

As discussed in section 8.2, GAWB plans to introduce MDQ-based delivery pricing from 1 July 2015. GAWB will implement a transition arrangement for customers that would be worse off under MDQ-based delivery pricing whereby those customers can remain on a grandfathered volume-based tariff until 2020. GAWB also intends to allow customers to change their MDQ reservations within the regulatory period as they gain experience with the new pricing arrangements. Finally, GAWB undertakes not to charge customers overrun charges where a customer's MDQ exceeds its reservation (except to the extent that the customer's unauthorised overrun causes damages).

GAWB considers that there is significant uncertainty regarding the revenue that will be recovered via MDQ-based delivery charges. This uncertainty arises from:

- some customers will modify their operations to be significantly less peaky (decreasing their contracted MDQ); and
- some customers will find that their MDQ requirements are greater than has been observed over the past two years and increase their contracted MDQ.

Moreover, GAWB currently estimates that the transition provisions will be triggered at approximately 25 of GAWB's 50 connections in 2016, falling to around 15 connections in 2020. However, there is uncertainty over the rate and extent to which affected customers will respond to the incentives inherent in GAWB's planned transition arrangements.

To protect both GAWB and customers from windfall gains/losses associated with the transition to MDQ-based delivery pricing, GAWB will implement a revenue cap for the delivery network for existing customers and for **the 2016–2020 regulatory period only**.

Under this mechanism, differences between actual and forecast delivery network revenue are rolled-forward (with balances earning/paying interest at the WACC for that year) to the beginning of the next regulatory period. No changes will be made to prices within period, other than CPI indexing.

A revenue cap on existing customers mirrors the effect of the current long-term volume contract quantities and does not affect GAWB's incentive to connect new customers.

For the avoidance of doubt, GAWB currently expects that this revenue cap would fall away in the next regulatory period. GAWB intends that all revenues would be regulated under hybrid price/revenue cap from 1 July 2020.

10 Contingent Supply Strategy

Achieving and maintaining the capability of responding to drought (and demand) triggers within two years and nine months of a defined trigger event is efficient. GAWB is entitled to recover its efficient costs.

This section details GAWB's expenditure on the CSS from 2010 to 2015 and GAWB's forecast expenditure from 2015.

This section also sets out GAWB's intention to add $22.3 million ($14 million plus capitalisation) of previously excluded CSS expenditure (including time value of money) to the RAB from 1 July 2015.

The price impact of the planned roll-in is approximately $30/ML for all customers. This corresponds to about 3% for raw water customers and 1% for treated water customers.

10.1 Introduction

Recognising that circumstances will arise in the future whereby GAWB will need to augment its water supply, it is critical that GAWB maintains the capability to respond to these circumstances and augment supply in a manner that is effective, efficient and meets the needs of customers.

Implementation of a water source augmentation takes a significant period of time. The lead-time to full operation of the second source can be up to 6 years (and under a drought triggered augmentation is required to commence up to 8 years before Awoonga Dam is projected to reach Dead Storage).[70] In some circumstances where the lead-time is 8 years it is unlikely to be possible for GAWB to implement an appropriate augmentation solution within the timeframe needed.

GAWB maintains a CSS, to enable GAWB to supply from a second high-reliability water source within a certain period from the occurrence of a defined trigger event. The application of the CSS requires GAWB to undertake preparatory works in relation to its preferred augmentation option so that it can access an additional supply of highly reliable water within a two-year construction timeframe.

Attaining a level of capability (and then maintaining that capability) to be able to implement a second water source in this timeframe requires GAWB to undertake preparatory works. These preparatory works necessitate GAWB undertaking some expenditure on planning and regulatory approvals to gain this capability such that it can defer the triggering of a source augmentation until 'as late as is safe'. The additional time afforded by the completion of the preliminary work creates the opportunity to identify efficiencies.

Attaining and then maintaining a state of preparedness can significantly reduce the lead-time to implementation of the relevant source augmentation. This reduction in lead-time has real value – reduction in/avoidance of unnecessary expenditure (unnecessary augmentations) and by deferring significant expenditure until as late as it is prudent and safe to do so.

[70] Under a drought-triggered augmentation, GAWB's Drought Management Plan (DMP) mandates that the second water source is implemented and supplying water whilst Awoonga Dam still has 2 years water supply remaining (i.e. 2 years supply above Dead Storage). Therefore, assuming an implementation timeframe of 6 years, drought-triggered augmentation activity would need to commence when Awoonga Dam has 8 years supply remaining in order to be completed in time and comply with the DMP. Under a demand-triggered augmentation, augmentation activity would need to commence 6 years before the second source supply is required.

10.2 Modelled value of the CSS

The Authority recommended that CSS expenditure incurred after April 2008 to be excluded from the RAB. The Authority argued that GAWB ought to have abandoned preparatory works when the then drought initially broke. Approximately $14 million of expenditure was excluded from the RAB. GAWB does not recover a 'return on investment' for the $14 million expenditure.

In response, GAWB developed a model and analysis to assess the costs and benefits of retaining the CSS. The analysis is discussed in detail in Appendix C.

The analysis demonstrates that maintaining the CSS strategy is the lowest cost option in 90% of cases. The expected value of retaining the CSS (considering only the drought trigger benefits) is approximately $30 million.

The analysis also demonstrated that, maintaining the preparatory works is the lower risk strategy. The benefit of having a fully prepared drought and demand response is valuable. The CSS is extremely valuable in times of multiple short-duration droughts, as frequent triggering and abandonment of early works would occur in the absence of the CSS.

The CSS is essential as:

- the CSS is the lowest cost strategy for managing supply augmentations;
- the CSS is insurance against drought and unforeseen demand increments; and
- failure to maintain CSS expenditure may result in higher costs for future preparatory works.

For these reasons, as discussed below, GAWB plans to roll-in the entire 2006–2015 CSS expenditure and future expenditure required to maintain the capability to respond efficiently to drought and demand increments. As this decision is inconsistent with the determination of the Authority in 2010, GAWB seeks to highlight both its intention and the associated reasoning.

10.3 2011–2015 capital expenditure

GAWB maintains its preparedness for augmentation through completion of its annual work program. The aim of the annual work program is to ensure that GAWB maintains its ability to commence early works activities (i.e. pre-construction) on emergence of a water supply augmentation trigger.

This level of preparedness means that further preparatory work can be delayed until supply falls to below 4 years and 9 months from failure. If any of the above outcomes were not achieved, then GAWB cannot have reasonable certainty that a supply could be developed within a defined time period.

During the 2011–2015 regulatory period, GAWB spent $5.60 million, comprised of:

- $3.40 million on preparatory work for obtaining access to a water supply from the lower Fitzroy River;
- $1.96 million obtaining required easements for the Gladstone to Fitzroy pipeline; and
- $0.24 million on improving the cost estimates for desalination and Awoonga Dam raising options.

The Authority did not support the inclusion of this expenditure in the RAB and recommended that GAWB spend $1.33 million over the 2011–2015 period, comprising $0.40 million for 'mothballing' the CSS, $0.40 million to further investigate desalination and other supply options, and $0.53 million to maintain a minimum approvals status until 2015.

GAWB's options were to spend an additional $5.60 million to capture the CSS capability or abandon the CSS and destroy approximately $30 million of value. GAWB concluded that the $5.60 million spent this regulatory period to capture and maintain the CSS capability was prudent.

10.3.1 Lower Fitzroy River Infrastructure

GAWB's analysis demonstrates that retaining the CSS is least cost for customers and that a supply from the Lower Fitzroy River is the least cost contingent supply source. Acting prudently, GAWB has continued to undertake preparatory works necessary to ensure that a supply from the Fitzroy River can be obtained within the timeframe required by the CSS.

The obtaining of environmental approvals for a water source is a fundamental component of the CSS. Without obtaining environmental approvals, GAWB cannot be certain that a supply will be available within the required timeframe. Therefore GAWB has continued to progress development of an EIS for the LFRIP (as joint proponent with SunWater).

The total spent by GAWB over the 2011–2015 period is $3.40 million.

10.3.2 Desalination plant and Awoonga Dam raising options

The Authority recommended further investigation of desalination options to spend of $0.40 million. GAWB spent $0.24 million improving the cost estimates for desalination supply and Awoonga Dam raising options.

Analysis concluded that a desalination option is not the least cost option in terms of a drought response where a large supply volume (circa. 30 GL p.a.) is required. A desalination option demonstrates value in a very limited range of circumstances (less than 5 GL p.a.) as the cost advantage over a 5 GL p.a. supply from the Fitzroy River is negligible. As set out in GAWB's Strategic Water Plan,[71] updated analysis of options for a second source of supply continues to recommend a supply from the Fitzroy River.

Therefore GAWB has not progressed further preparatory works for desalination sources.

10.4 Forecast 2016–2020 capital expenditure

Under the CSS, GAWB has invested in preparatory works that enable GAWB to commission a new 30 GL p.a. water source within 2 years, 9 months of a trigger. Retaining this response capability requires on-going investment. GAWB must determine whether maintaining the capability is appropriate, given the holding costs.

As discussed above, GAWB's analysis compares two strategies:

- retaining CSS preparatory works (drought-triggered second source work must commence when storage level falls to 4 years and 9 months from failure); and
- abandon CSS works (drought-triggered second source work must recommence when storage level falls to 8 years from failure).

Monte Carlo analysis comprising thousand simulations of 20-year future storage sequences was undertaken comparing GAWB with CSS holding costs against GAWB without CSS holding costs.

At the current level of contracted demand (63 GL p.a.), the value of retaining CSS preparatory works is approximately $30 million. At 78 GL p.a. of contracted demand, GAWB would need to immediately commence preparatory works to comply with its Drought Management Plan and the demand trigger policy. At 78 GL p.a. of contracted demand, the value of retaining the CSS preparatory works is the full present value of doing the work: approximately $50 million.

From another perspective, the expected cost of abandoning the CSS preparatory works is more than $30 million. The analysis demonstrates that in 10% of climate simulations the 'without CSS' case has lower costs than the 'with CSS' case however that

[71] GAWB, *Strategic Water Plan*, November 2013.

benefit is limited to a maximum of $3.5 million. In approximately 90% of modelled storage scenarios the inclusion of the CSS strategy is favourable. The expected benefit of including the CSS strategy is approximately $30 million.

This analysis considers only a drought response value of the CSS preparatory works. The analysis does not consider the value of the works in the case of a demand trigger.

GAWB is forecasting expenditure of an average of $0.36 million per annum over the next regulatory period. This level of maintenance expenditure is prudent and efficient. The analysis set out in Appendix C shows that the expected long-term cost to customers is lower when GAWB spends an average of $0.36 million per annum holding costs than it would be if GAWB abandoned the CSS.

The Storage Price (Awoonga zone) will be affected by this capital expenditure project.

10.5 Forecast 2021–2035 CSS capital expenditure

The underlying assumption for expenditures in this submission is that no storage augmentation will be required within the planning horizon.

10.6 Roll-in of previously excluded CSS expenditure

In 2010, the Authority recommended that CSS expenditure incurred after April 2008 should not be included in the RAB. The Authority argued that GAWB ought to have abandoned preparatory works when the 2004–2007 drought initially broke. Approximately $14 million of expenditure was excluded from the RAB (which means that customers' prices do not recover a 'return on investment' or 'return of investment' for that expenditure).

Allowing for GAWB's holding costs (at the 2010 regulatory period WACC) the value of the excluded expenditure is currently $22.31 million.

10.6.1 GAWB's actions in 2008 were prudent and efficient

As discussed above, as part of the work undertaken in 2012 to confirm that the forecast on-going capital expenditure is prudent and efficient, GAWB developed a model to assess the costs and benefits of retaining the CSS or of abandoning the works, considering only the drought response benefits. This model demonstrates that GAWB's decision to proceed with CSS expenditure after the 2008 inflows was prudent and efficient, showing that proceeding with CSS minimises the long-run cost of water to customers. The analysis is discussed further in Appendix C.

There are two important conclusions with respect to GAWB obtaining and retaining the CSS capability:

- firstly, 'retain CSS' is much lower cost than the 'abandon CSS';
- secondly, if drought conditions persist for longer than 22 weeks after construction is triggered, the lowest cost strategy is then to complete the project. (At this point, $25 million will have been spent).

Whereas the Authority's 2010 determination was made on the basis of a qualitative assessment, the analysis leading to GAWB's conclusions quantifies the benefit of retaining the CSS, providing clear rationale for rolling-into the RAB:

- the previously excluded expenditure of $22.31 million;
- GAWB's 2011–2015 CSS capital expenditure; and
- on-going capability maintenance.

Even if the 'abandon preparatory work' were the expected least cost option, other considerations suggest that it might not be the prudent approach. 'Maintaining the preparatory works' is the lower risk strategy – there will be some futures when the benefit of

having a fully prepared drought and demand response is extremely valuable. These futures include times when multiple short-duration droughts occur, requiring frequent triggering and abandonment of early works if the triggers are applied mechanically.

Because:

- the CSS is the lowest cost strategy for managing supply augmentations; and
- the CSS is essentially free insurance against drought and unforeseen demand increments,

GAWB has rolled the entire 2006–2010 CSS expenditure into the RAB contained in this submission.

GAWB's quantitative assessment of the value of the CSS expenditure is available to the Authority and its consultants.

10.6.2 Price impact of roll-in of CSS

The base case prices in Table 3 include the roll-in of previously excluded CSS expenditure of $22.31 million. This increases prices to all customers by approximately $30/ML. Table 31 shows the zone price effect of the roll-in of previously excluded CSS costs.

Table 31: Sensitivity of zone price to roll-in of previously excluded CSS costs

Pricing zone	Price impact of excluding CSS roll-in
Awoonga	–6%
Boyne Raw	–3%
Central/Mt Miller Pipeline/Hanson Rd Pipeline	–3%
QAL	–3%
Fisherman's Landing Raw	–2%
Gladstone City	–2%
GWTP to South Gladstone	–2%
Calliope	–1%
South Gladstone to Toolooa	–2%
Boyne Potable	–1%
Benaraby	–1%
North Industrial Potable	–1%
Fisherman's Landing Potable	–1%
Boat Creek to East End	–1%

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11 Other issues

11.1 Revenue carryover from 2011–2015 regulatory period

In the 2005 review, the Authority recognised that, by recommending a price-smoothing period longer than the regulatory period, prices in a regulatory period will generate revenues that are different from the target (building block) revenues for that regulatory period.

To ensure that GAWB recovers its efficient costs over time, the Authority proposed that smoothed prices in future regulatory periods should incorporate an adjustment to reflect the effects of past price smoothing. This adjustment is achieved by a carryover of the present value of differences between forecast (smoothed) revenues and target (building block) from one regulatory period into the next regulatory period.

In 2010, the Authority stated:

> The adjustment should be based on the difference between the smoothed price revenue and the annual revenue that would result from the use of the building block approach, with annual differences capitalised to the commencement of the next pricing period using the WACC applicable for the previous assessment. The sum of the capitalised amounts carried forward from the previous assessment should be subject to price smoothing on a forward-looking basis, in a similar manner to the other elements of the revenue requirement.

This adjustment methodology does not reflect changes in revenue resulting from a difference between actual and expected revenues. Rather, the adjustment reflects the difference between building blocks and smoothed revenues, given the same set of assumptions. For this reason, the revenue carryover from 2011–2015 regulatory period is calculated using the 2010 pricing model.

The calculated price smoothing carryover for the 2016–2020 regulatory period is $94.3 million (in 2016 dollars).

The 2010 pricing model was previously provided to the Authority. GAWB is happy to provide another copy (as a confidential submission[72]) so that the Authority can independently verify GAWB's calculation.

GAWB has also provided its 2015 pricing model to the Authority (as a confidential submission) so that the Authority can verify that the revenue carryover is smoothed across future prices as recommended.

11.2 Pricing in drought circumstances

11.2.1 Current pricing principle and application

When supply restrictions are triggered, GAWB is permitted to adjust the volumetric charge for storage and delivery services to maintain revenues for GAWB and recover any efficient drought-related costs not already incorporated into prices.

11.2.2 Discussion

At current price levels (and, in particular, access/volumetric price split), GAWB has very low direct revenue risk in times of drought-triggered supply restrictions:

[72] GAWB must keep its pricing model confidential because it contains confidential information regarding customer reservations and capital contribution rebates. Because GAWB uses a zonal pricing system and there are few customer connections in each zone it would be possible to back-solve for customer quantities even if an 'anonymous' version model were published.

- volumetric prices represent largely GAWB's variable costs, therefore when customers reduce consumption GAWB's costs should fall at approximately the same rate as volumetric revenue;[73] and
- access charges are charged on contract quantities (not actual or restricted quantities), so access charge revenue is unaffected by supply restrictions.

However, to the extent that at the time of a drought GAWB's prices included a significant component for LRMC of capacity or there are significant drought-related costs not already incorporated into prices, then GAWB would under-recover its target revenue when supply restrictions are triggered.

It is in GAWB's interest to retain a regulatory mechanism to compensate GAWB for lost revenue (and additional costs) in times of drought. However, any attempt to increase prices at the same time as requiring customers to restrict consumption is unlikely to be supported by customers or the wider community (to the point where it may be practically impossible to raise prices).

A more palatable approach (and one more likely to enable GAWB to eventually recover costs) would be that lost revenue (corrected for avoided costs and drought-related costs) as a result of restrictions be 'rolled-forward' and recovered in prices after consumption restrictions have been lifted.

This approach would also facilitate recovery of costs over a 20-year period, which is fairer for the community.

In drafting the existing recommendation in 2010, the Authority possibly intended that a rising price during drought would assist the restrictions regime to efficiently reduce demand for water. However, GAWB's commercial framework allows customers to trade capacity. In times of restriction GAWB expects that this secondary market for capacity will set an effective high marginal cost of consumption. Trading will facilitate an efficient allocation of restricted capacity between customers. Therefore a dynamic pricing response from GAWB is not required.

11.2.3 Revised pricing principle

GAWB intends to amend the pricing principle for recovery of efficient drought-related costs to state:

> GAWB is entitled to recover revenue lost as the result of supply restrictions and any efficient drought related costs not already incorporated into prices. Recovery of costs would occur following the first price review after restrictions are lifted.

The process for recovery of costs is likely to include:

- at the time that supply restrictions are triggered, GAWB would record lost revenue and efficient drought-related costs not already incorporated into prices;
- at the subsequent price review, the calculation of lost revenue would be reviewed by Authority; and
- the net present value of lost revenue (and efficient drought-related costs not already incorporated into prices) would be rolled-forward to the start of the regulatory period as a building block and included in the tariff calculation (i.e. treated in the same way as the current price smoothing carryover).

Whilst this approach carries risk that some costs will be disallowed by the Authority at their review, it avoids raising prices to customers at the same time that GAWB is imposing supply restrictions.

[73] This observation only holds while the LRMC of capacity is a small fraction of price.

11.3 Pricing practices for a multiple source network

11.3.1 Current pricing principle and application

In 2007, GAWB requested that the QCA Ministers refer GAWB's proposed CSS, so that GAWB could obtain regulatory certainty regarding recovery of costs of preparatory works for the GFP and associated LFRIP.

That investigation was conducted in three parts. Part A considered the CSS generally (whether the strategy was prudent, whether selection of a supply from the Fitzroy was appropriate, how the efficient costs of preparatory works should be included in prices).

Part B considered the second source construction triggers. That is, Part B considered the process for committing to construction of a second source (assuming preparatory works were already complete) under drought or emergent demand triggers.

Parts A and B of the investigation were completed before the 2010 price review.

GAWB's current pricing principles assume a single supply source (Awoonga Dam). Delivery prices increase with distance from the source. Part C of the Authority's investigation was intended to address the pricing principles that would apply in a multiple source system, where 'distance from the source' may be dynamic depending upon which source is supplying customers at the time.

GAWB lodged its Part C submission in June 2009. However, the Authority was not able to complete the investigation before the 2010 price review.

11.3.2 Discussion

GAWB considers that the multi-source pricing practices submitted in 2009 are a good basis for charging for use of system where flows may change over time. The approach is set out in the following extract from GAWB's 2009 submission:

> When a second source is connected to the trunk raw water delivery network, there is no change to the flows in raw water spurs or the potable water delivery network. For this reason GAWB proposes that pricing of raw water spurs and the potable water delivery network remains unchanged. That is, GAWB proposes that the current zonal pricing practice is retained.
>
> Consistent with economic efficiency and a principle that all customers should pay the same price for the same service, GAWB proposes that all customers pay the same water reservation and storage price, irrespective of the source from which their supply is normally physically derived.
>
> Other than a small amount of pipeline assigned to delivery system to achieve desired delivery price outcomes, GAWB proposes that the connection between the new source and existing delivery system is considered to be a source asset and its economic cost is recovered through the water reservation and storage price.
>
> Three options for pricing the trunk raw water delivery network are discussed:
> - postage stamped – as source asset;
> - postage stamped – as delivery system asset; and
> - zonal pricing based on normal flow.
>
> In network businesses, 'postage stamped' pricing means that prices are not related to location. Most electricity, gas and water distribution networks (especially for mass market customers) set prices on a postage stamp basis. Most electricity, gas and some water transmission networks set prices on a location-specific basis.
>
> GAWB proposes to retain the practice of zonal pricing with prices based on normal flows. Where location-specific pricing is relatively inexpensive to calculate (few off-takes, stable network configuration, etc), it is usually considered by regulators to have both efficiency and equity benefits over a geographically averaged approach.
>
> However, compared to the other arrangements, modelling of zonal prices is more complex (especially when flow characteristics change over the pricing horizon) and prices are more difficult to explain to customers.

GAWB also proposes that, after the specific location of demands at the time of augmentation trigger is known (so customer price impacts can be properly assessed), a single pricing zone for the trunk raw water delivery network should be considered in preference to zonal pricing if:

- there is a reasonable amount of spare capacity throughout the trunk raw water delivery network or if the marginal cost of capacity is similar throughout the trunk raw water delivery network; and
- average price changes can be equitably managed (through a revenue neutral transition or similar arrangement).

Postage stamp pricing of the sources and trunk raw water delivery network as a single source zone would result in inefficient and inequitable outcomes and is not supported by GAWB.

11.3.3 GAWB's plan

The current pricing practices have been developed for a single source system. GAWB plans to develop pricing practices for a multi-source system when a source augmentation is imminent.

11.4 Financeability test

GAWB has included a financeability test in its 2015 price model.

GAWB has considered IPART's 2013 final decision in relation to financeability tests in price regulation and also NERA's 2013 report to the ESC on financeability tests for regulated water service providers.

NERA recommended that ESC adopt the following metrics for financeability test:

- Funds from operations (FFO) interest cover;
- Net debt to RAB;
- FFO to net debt; and
- Retained cash flow to CAPEX.

NERA includes an internal financing metric (retained cash flow to capital expenditure) but notes that:

the internal financing metric is not definitive in determining the financeability because a service provider with strong leverage ratios and a poor internal financing position is still likely to attract investors.

IPART concludes that the internal financing metric is rarely cited as a driver for potential downgrades or upgrades to credit ratings and will therefore not include this metric in its formal financeability assessment.

GAWB has adopted the four metrics set out above for its financeability test but notes that the internal financing metric is likely to be viewed as less important than the first three metrics.

To calculate the metrics IPART intends to adopt a simplified, notional set of financial statements constructed from its building block model. Both IPART and NERA support adjustments to these notional statements for operating leases and pensions in accordance with the methodology used by Moody's, and will forecast actual interest expenses and debt levels. GAWB has adopted the IPART approach.

Table 32 shows the GAWB's assessed financeability based on the indicative prices. Target ranges for each metric are from the IPART paper, except for the internal financing metric for which the range is taken from the NERA paper and is for a Moody's 'Baa' rating.

GAWB does not meet the target level for the internal financing metric. However, because GAWB has low gearing and significant retained earnings and for reasons noted above, GAWB does not consider that any modification to prices is required to ensure financeability.

Table 32: GAWB financeability based on indicative charges

Metric	Range for BBB rating	Indicative GAWB value			
		2016	2017	2018	2019
FFO interest cover	1.7–2.5x	2.8x	2.8x	2.9x	3.0x
Net debt to RAB	60–91%	39%	29%	37%	36%
FFO to net debt	6–10%	10%	14%	11%	12%
Retained cash flow to CAPEX	1–1.5x	0.6x	0.4x	3.3x	1.4x

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Gladstone Area
Water Board