QUEENSLAND COMPETITION AUTHORITY

Draft Report

Gladstone Area Water Board: 2007 Investigation of Contingent Water Supply Strategy Pricing Practices

Stage A

October 2007

Level 19, 12 Creek Street Brisbane Queensland 4000
GPO Box 2257 Brisbane Qld 4001
Telephone (07) 3222 0555
Facsimile (07) 3222 0599

general.enquiries@qca.org.au
www.qca.org.au

SUBMISSIONS

This report is a draft only and is subject to revision. Public involvement is an important element of the decision-making processes of the Queensland Competition Authority (the Authority). Therefore submissions are invited from interested parties concerning its assessment of Gladstone Area Water Board: 2007 Investigation of Contingent Water Supply Strategy Pricing Practices. The Authority will take account of all submissions received.

Written submissions should be sent to the address below. While the Authority does not necessarily require submissions in any particular format, it would be appreciated if two printed copies are provided together with an electronic version on disk (Microsoft Word format) or by e-mail. Submissions, comments or inquiries regarding this paper should be directed to:

Queensland Competition Authority
GPO Box 2257
Brisbane QLD 4001
Telephone: (07) 3222 0555
Fax: (07) 3222 0599
Email: gawb.investigation@qca.org.au

The **closing date** for submissions is 2 November 2007.

Confidentiality

In the interests of transparency and to promote informed discussion, the Authority would prefer submissions to be made publicly available wherever this is reasonable. However, if a person making a submission does not want that submission to be public, that person should claim confidentiality in respect of the document (or any part of the document). Claims for confidentiality should be clearly noted on the front page of the submission and the relevant sections of the submission should be marked as confidential, so that the remainder of the document can be made publicly available. It would also be appreciated if two copies of each version of these submissions (ie the complete version and another excising confidential information) could be provided. Again, it would be appreciated if each version could be provided on disk. Where it is unclear why a submission has been marked "confidential", the status of the submission will be discussed with the person making the submission.

While the Authority will endeavour to identify and protect material claimed as confidential as well as exempt documents (within the meaning of the *Freedom of Information (FOI) Act 1989*), it cannot guarantee that submissions will not be made publicly available. As stated in s187 of the *Queensland Competition Authority Act 1997* (the QCA Act), the Authority must take all reasonable steps to ensure the information is not disclosed without the person's consent, provided the Authority is satisfied that the person's belief is justified and that the disclosure of the information would not be in the public interest. Notwithstanding this, there is a possibility that the Authority may be required to reveal confidential information as a result of an FOI request.

Public access to submissions

Subject to any confidentiality constraints, submissions will be available for public inspection at the Brisbane office of the Authority, or on its website at www.qca.org.au. If you experience any difficulty gaining access to documents please contact the office (07) 3222 0555.

Information about the role and current activities of the Authority, including copies of reports, papers and submissions can also be found on the Authority's website.

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GLOSSARY

ACCC	Australian Competition and Consumer Commission
AHD	Australian Height Datum
Capex	Capital Expenditure
CAPM	Capital Asset Pricing Model
COAG	Council of Australian Governments
CPI	Consumer Price Index
CPM	Callide Power Management
CQWRSS	Central Queensland Regional Water Supply Strategy
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CSO	Community Service Obligation
CSC	Calliope Shire Council
DBCT	Dalrymple Bay Coal Terminal
DORC	Depreciated Optimised Replacement Cost
DMP	Drought Management Plan
DNRW	Department of Natural Resources and Water
EIS	Environmental Impact Study
ERA	Economic Regulation Authority
FOI	Freedom of Information
FRP	Fitzroy River Pipeline
GAWB	Gladstone Area Water Board
GEIDB	Gladstone Economic and Industry Development Board
GCC	Gladstone City Council
GL	Gigalitre
GPN	Gladstone Pacific Nickel
HNFY	Historic No Fail Yield
IPART	Independent Pricing and Regulatory Tribunal (NSW)
LRMC	Long run marginal cost
MCA	Multi-Criteria Analysis
MJA	Marsden Jacob Associates
ML	Megalitre
MRR	Maximum Revenue Requirement
NPV	Net Present Value

Ofwat	Office of Water Services, UK
QAL	Queensland Alumina Limited
QCA Act	Queensland Competition Authority Act (1997)
QWC	Queensland Water Commission
ROP	Resources Operations Plan
RTA	Rio Tinto Aluminium
SGTIC	Stanwell- Gladstone Transport Infrastructure Corridor
SMEC	Snowy Mountains Engineering Corporation
SWP	Strategic Water Plan
the Authority	The Queensland Competition Authority
WACC	Weighted Average Cost of Capital
WRP	Water Resources Plan

EXECUTIVE SUMMARY

Ministerial Direction

The Authority was directed by the Ministers to investigate GAWB's proposed contingent supply strategy, in three distinct stages:

(a) GAWB's proposed recovery of preparatory expenditure for the Fitzroy Pipeline, including the prudence of the pipeline as the appropriate contingent source strategy, the level of efficient costs, the timing of expenditures and the means for including costs in prices in future years;

(b) the proposed criteria for triggering the implementation of the strategy in the event of drought or unexpected increases in demand; and

(c) the changes proposed by GAWB to its pricing practices once the augmentation is completed.

This draft report responds to GAWB's proposals regarding part (a) of the Ministers' Direction. GAWB has yet to make a submission in response to parts (b) and (c) of the Direction.

GAWB's Proposal

GAWB identified as its key prospective risks: projected new demand growth; the effect of changes in hydrology on supply; and the potential for continuing drought to reduce short term supply.

In response to these risks, GAWB proposed a contingent supply strategy based on the construction of a pipeline to link the Lower Fitzroy River and the proposed Aldoga Reservoir. The water is to be sourced from the raising of the existing Eden Bann Weir and/or a new weir at Rookwood Crossing.

To ensure water is available within two years of a decision to construct the pipeline, GAWB proposed completing preparatory works totalling $23.8 million by mid 2008. In addition, GAWB considered that expenditure of $1 million is warranted to assess the feasibility of a local desalination plant.

GAWB proposed that the costs of its contingent source strategy be capitalised to 1 July 2010, by which time it expected that the Authority would have reviewed the expenditure incurred and built it into prices. GAWB also proposed that preparatory costs be incorporated into prices in a manner which ensured that all users share the cost.

Authority's Assessment

The Risks Confronting GAWB

The Authority notes that:

- historically, demand for water from new projects has generally been overestimated. Nevertheless, the Authority has considered low and high demand scenarios in conjunction with supply scenarios in determining the prudence of the various response strategies;

- hydrology is a long-term risk. Until such time as the historic no failure yield (HNFY) is formally re-assessed, it remains the appropriate measure for long-term planning; and

- drought is the key imminent risk. GAWB's proposed average three-year worst inflow scenario is reasonable for triggering the DMP. However, as noted by GAWB, there is a possibility of an unpredicted event, such as one or more years of even lower inflows or a failure in inflows in the coming wet season.

Key Conclusions

(a) A contingent supply strategy is a prudent response to the demand and supply risks facing GAWB.

(b) The assessment and threshold criteria applied by GAWB were generally reasonable given imminent risks.

(c) Under the worst case scenario postulated by GAWB (the average of the three worst consecutive inflows), there is sufficient time to undertake further investigations of options before finally committing to a preferred contingent supply source. The Authority has concerns that GAWB's preference for the Fitzroy Pipeline may be biased by the relative level of effort directed to it as opposed to other options – particularly desalination.

(d) It is prudent for GAWB to continue working towards implementing the Fitzroy Pipeline option as there is a possibility of an unexpected event, such as one or more years of even lower inflows or a failure in inflows in the coming wet season. Under this scenario, the Fitzroy Pipeline would be the prudent option.

(e) GAWB should ensure that arrangements are in place for a right of access to supplies of water from the Fitzroy River by mid-2012 should they be required.

(f) Preparatory expenditures on items such as project management, approvals, consultation and communication, engineering and investigations and land acquisition are appropriate if there is a high probability of commencing the Fitzroy Pipeline in the next few years.

(g) Asset creation should be deferred until the preferred contingent supply source is finally settled. Any items purchased in advance of construction will be at GAWB's own risk.

(h) GAWB should continue to conduct and promote work on other options such as desalination, air and sea water cooling and alternative supply restrictions.

(i) The demand/supply situation should be kept under active review and the level and timing of preparatory expenditure on the Fitzroy Pipeline should be reconsidered if circumstances allow more time to review other options.

(j) Preparatory expenditures should be subject to an ex-post review before being considered for incorporation in the asset base, as proposed by GAWB.

(k) Prudent preparatory costs should be treated as work in progress, with the capitalised cost included in the asset base upon commissioning of the infrastructure. The appropriate WACC rate for capitalising preparatory costs is the WACC rate that is applicable in the relevant regulatory period.

(l) In accord with the Authority's current general practice, prudent preparatory costs should not be optimised out of the asset base without compensation other than under certain limited circumstances.

(m) It is inappropriate to consider the recovery of preparatory costs independent of considering GAWB's submission in regard to the recovery of the costs of the new infrastructure to which the preparatory costs relate. This is a matter to be considered in part (c) of the Ministers' Direction.

(n) Although the Authority does not propose to consider the treatment of preparatory costs for pricing purposes separately from the treatment of the remainder of the costs of the related assets, it reviewed GAWB's estimates for the purpose of providing greater

information to customers. This review indicated that the preparatory costs would add between $18 and $27/ML to prices.

(o) Of more relevance to customers is the impact on prices of the construction of the contingent supply. On the basis of the limited available information, the Authority estimates that, based on a 30,000ML per year Fitzroy Pipeline, prices would need to increase by around $410/ML on average under a low demand scenario, and by around $310/ML under a high demand scenario.

(p) GAWB should demonstrate that there is a significant level of customer support for its preferred contingent strategy option. It should provide indicative pricing implications for the alternative options based on alternative demand scenarios. This would provide the information to enable all parties to compare the financial risks of the alternative contingent supply strategies. It is possible that, once the pricing implications of the Fitzroy Pipeline are known, customers may find by-pass opportunities or demand management strategies which reduce their water requirements of GAWB.

The analysis supporting these conclusions is set out in the body of the Draft Report.

1. BACKGROUND

The Authority has been directed by the Ministers to review the appropriateness of GAWB's proposed contingent supply strategy and associated pricing practices, in three stages. The stages relate to the recovery of proposed preparatory expenditure, the triggers for construction and the recovery of the efficient costs for augmentation.

This Draft Report investigates the appropriateness of GAWB's proposed recovery of preparatory expenditures for its preferred contingent supply strategy of sourcing water from the Fitzroy River. The investigation encompasses the prudence of the proposed contingent supply strategy, the level and timing of proposed preparatory expenditures, and the implications for pricing.

1.1 Introduction

As part of its strategic water planning, GAWB has developed a contingent supply strategy which entails the sourcing of water from the Fitzroy River near Rockhampton as the preferred option.

In the context of this strategy, GAWB proposes to undertake preparatory expenditure to attain reasonable certainty that water can be sourced from the Fitzroy River within 24 months of agreed events (either drought or demand-led) that might trigger a supply augmentation. In addition, GAWB proposes to incur some expenditure on alternative potential supply strategies such as desalination.

1.2 The Scope of the Current Investigation

The Ministerial Direction

On 23 February 2007, the Premier and the Treasurer (the Ministers), pursuant to section 23 of the *Queensland Competition Authority Act 1997* (*QCA Act 1997*), referred the declared government monopoly business activities of GAWB to the Authority for investigations regarding the appropriateness of the following pricing practices:

(a) GAWB's recovery of proposed preparatory expenditure from existing and future customers, specifically having regard to:

  (i) the prudence of GAWB's contingent source strategy, including selection of a supply from the Fitzroy River as the appropriate contingent source;

  (ii) the level of efficient costs associated with the development of GAWB's contingent supply strategy that should be included in prices;

  (iii) the timing of expenditures which are related to the implementation of the contingent supply strategy;

  (iv) the means by which efficient costs of the contingent supply strategy should be included in prices for subsequent years;

(b) GAWB's proposed criteria for triggering construction of the appropriate augmentation in the event of drought or unexpected additional demand; and

(c) GAWB's proposed changes to pricing practices related to declared activities required to enable GAWB to recover its efficient costs of the system as appropriately augmented.

In addition, under section 24 of the *QCA Act 1997*, the Authority was also directed to:

- consult with GAWB, GAWB's customers and other relevant stakeholders;
- with respect to matter (a) in the referral, provide a Draft Report on the investigation within 120 days of receipt of this notice, with the Final Report to be provided within 60 days of the Draft Report;
- with respect to matter (b) in the referral, provide a Draft Report on the investigation within 120 days of receiving notification of GAWB's proposed criteria for triggering implementation, with the Final Report to be provided within 60 days of the Draft Report;
- with respect to matter (c) in the referral, provide a Draft Report on the investigation within 120 days of receiving notification of GAWB's proposed pricing practices, with the Final Report to be provided within 60 days of the Draft Report; and
- consult with the Queensland Water Commission in regard to any implications the findings of its investigations may have for pricing practices in South East Queensland.

The required timelines are subject to the receipt of information acceptable to the Authority and its consultants, any subsequent changes agreed to between the Authority and GAWB, and exclude nominated consultation periods.

Scope of Current Investigation

This Draft Report relates solely to part (a) of the Ministerial Direction.

The remaining two stages of the Ministerial Direction will be investigated later, upon receipt of the relevant proposals and documentation from GAWB.

1.3 GAWB

Charter

GAWB is responsible for the supply of raw and treated water to industrial and local government customers in the Gladstone area. It operates as a commercialised statutory authority and, under the *Water Act*, is required to be commercially successful in its business activities and efficient and effective in providing goods and services, including CSOs.

Recent History

In 1996, GAWB developed a Strategic Water Development Plan, which was further redefined in 1998. This plan led to the raising of Awoonga Dam to 40m which was completed in 2002.

In September 2000, the Ministers directed the Authority to undertake an investigation of GAWB's pricing practices. In its 2002 Final Report, *Gladstone Area Water Board: Investigation of Pricing Practices*, the Authority recommended pricing practices for GAWB which were accepted by the Ministers.

Between 1996 and 2003, Gladstone experienced its then worst drought on record. During this time, water restrictions were introduced for the first time. In response, water users implemented more stringent controls over their water use and a number of industrial water users undertook capital investment to improve their water-use efficiency.

In mid 2003, GAWB revisited its Strategic Water Development Plan and initiated a Strategic Water Planning Project. This project was developed in response to changes in expectations and circumstances that emerged following the drought, and GAWB's view that the region is increasing in importance as a strategic industrial centre.

In April 2004, the Ministers directed the Authority to again investigate GAWB's pricing practices, particularly in response to changes in hydrology, demand and drought management arrangements.

In November 2004, GAWB released its Final Report on the Strategic Water Planning Project. The report became known as GAWB's Strategic Water Plan (SWP). The SWP investigated various supply options and concluded that GAWB's preferred supplementary source of supply was the lower Fitzroy River Pipeline.

In March 2005, the Authority recommended revised pricing practices for GAWB and an appropriate framework for monitoring pricing practices (2005 Final Report *Gladstone Area Water Board: Investigation of Pricing Practices*.). The Ministers broadly accepted the Authority's recommendations.

GAWB is currently implementing the approved pricing practices and contractual framework recommended in the Authority's 2005 Final Report.

In its 2005 Final Report, the Authority noted that GAWB had (then) yet to prepare a Drought Management Plan (DMP), estimate system losses or fully assess all the risks associated with the business activity. Further, while GAWB provided a forward capital plan including augmentation, this plan did not cover any elements of its SWP. Therefore, the Authority incorporated future capital requirements in its 2005 Final Report which were consistent with the advice of its consultant, the Snowy Mountains Engineering Corporation (SMEC).

In September 2006, GAWB released its DMP which detailed the level of supply restrictions which would be imposed should drought conditions emerge. A focus of GAWB's DMP is to provide for the timely least cost augmentation of supply to mitigate the effects of drought, and thus substantially reduce the likelihood of circumstances arising that would require the imposition of water supply restrictions.

GAWB has recently reviewed its inflow assumptions following the 2006/07 wet season and has amended its current DMP. GAWB's change to a more conservative inflow assumption based on the worst consecutive three-year sequence on record rather than the worst 10 year sequence has significant implications for the DMP. GAWB's revised DMP has been provided to customers for consultation, and has been subsequently been accepted (that is registered) by the Department of Natural Resources and Water (DNR&W) as complying with the requirements of the *Water Act 2000*.

1.4 Approach to the Investigation

In undertaking the current investigation, the Authority has:

- released GAWB's Proposal for preparatory expenses in relation to part (a) of the investigation for comment;
- taken into consideration all customer and stakeholder submissions, including further submissions from GAWB in response to stakeholder submissions;
- commissioned advice from independent consultants on relevant technical issues;

- consulted with GAWB, GAWB's customers and all other relevant stakeholders to gain further understanding of matters relevant to the investigation; and

- consulted with the Queensland Water Commission (QWC) in regard to any findings in this investigation that had potential implications for pricing practices in South East Queensland.

1.5 GAWB's Proposal

On 27 March 2007, the Authority received GAWB's submission *Gladstone Area Water Board: Submission to the Queensland Competition Authority, Fitzroy River Contingency Infrastructure*. The Submission identifies the preferred next water source, and the preferred contingent supply strategy, as a pipeline between the Lower Fitzroy River and the proposed Aldoga Reservoir (the Fitzroy Pipeline).

The Fitzroy Pipeline option involves a 105km pipeline, originating upstream from the Fitzroy River Barrage. GAWB in its submissions has focussed upon evaluating a pipeline with a capacity of 30,000ML per year. It includes associated pump stations, water treatment plant (at the Fitzroy end), a terminal reservoir at Aldoga and costs associated with future storage infrastructure on the lower Fitzroy River. The proposed pipeline and associated infrastructure are shown in Figure 1.1.

GAWB has submitted that, under the Central Queensland Regional Water Supply Strategy (CQRWSS), it has a reserved volume of 30,000ML from the lower Fitzroy, to be sourced from the raising of the existing Eden Bann weir and/or a new weir at Rookwood Crossing, with construction scheduled for completion by 2011. In the event water is required before these weirs are completed, GAWB expects to be able to source water from the Fitzroy River. Alternatively, GAWB has indicated that it may be possible to fast-track the construction of the weirs for completion by mid to late 2010.

GAWB has proposed, under its Drought Management Plan, a low supply alert would be triggered 5 years before anticipated supply failure, based on the assumption that average inflows over the 5-year period would be equivalent to the average of the worst 3 consecutive years of rainfall. A low supply alert would be in place for 1 year, and if inflows have subsequently not recovered, restrictions of 10% of contracted demand would then apply to all customers.

GAWB's proposal is for the construction of the contingent supply strategy to be triggered when these restrictions commence (mid-2008 under current drought circumstances). Under this scenario, the pipeline would be completed in 2 years and be in operation at the end of year 3 after the commencement of the DMP (by mid-2010).

GAWB has already incurred some preparatory costs, and proposes to complete preparatory works before mid-2008.

GAWB has proposed not to modify prices to take account of the preparatory costs of its contingent supply strategy until 1 July 2010 by which time it expects that the Authority will have completed its next review of GAWB's pricing practices.

In the submission, GAWB requests that the Authority endorse the following principles for the 2010 price review:

- that the contingent supply strategy is appropriate and prudent;

- that preparatory expenditure is prudent;

- that certain specific types of expenditure should be included in GAWB's asset base used to calculate tariffs from 1 July 2010; and

- that preparatory expenditure will not subsequently be optimised out of the asset base without compensation to GAWB.

1.6 Structure of the Report

The Draft Report is structured as follows:

- Chapter 1 – Background;

- Chapter 2 – Overview of GAWB's Business;

- Chapter 3 – Prudence of the Proposed Contingent Supply Strategy;

- Chapter 4 – Preparatory Expenditure; and

- Chapter 5 – Impacts on Pricing in Subsequent Years.

1.7 Other Issues

Under section 26 of the *QCA Act* (1997), the Authority must have regard for a variety of matters including consumer protection, the costs of services, demand management and social welfare considerations to name a few. Any of these matters deemed relevant to the Authority's decision have been taken into account throughout the Authority's deliberations.

FIGURE 1.1


Gladstone - Fitzroy Pipeline
Project Concept as at August 2007
N
0 5 10 15 20 Km
Eden Bann Weir
Proposed Water Treatment Plant
Proposed River Intake
Fitzroy Barrage
ROCKHAMPTON
Stanwell Power Station
Proposed Rookwood Weir
Proposed Fitzroy Pipeline
Proposed Raglan Pumping Station
Proposed Aldoga Reservoir
Mt Miller
GLADSTONE
Toolooa Reservoir
Awoonga Dam
O C E A N
GREAT BARRIER REEF MARINE PARK
CORAL SEA
CURTIS ISLAND
YEPPOON
MOUNT MURIAN

2. OVERVIEW OF GAWB'S BUSINESS

GAWB is a commercialised statutory authority which has responsibility for providing water storage and delivery services to industrial, electricity generation and local government customers in the Gladstone area.

GAWB's pricing practices have changed over time and contracts largely reflect the arrangements prevailing at the time of their negotiation.

GAWB is currently in the process of implementing the pricing principles and contractual framework recommended in the Authority's 2005 Final Report.

2.1 Nature and Scope

As a commercialised government owned entity, GAWB is required to adopt pricing practices consistent with the Council of Australian Governments (COAG) principles of full cost recovery and consumption-based pricing. The COAG principles also require the implementation of two-part tariffs for urban water services where cost effective.

Consistent with the requirements of the *Water Act 2000,* GAWB is required to:

- commercially manage its affairs. This includes managing contracts with suppliers and customers, regulatory arrangements with the Authority, debt management and opportunities to improve its financial performance;
- plan and deliver future water supply capacity, reliability and quality. This involves identifying likely demand scenarios and evaluating water supply and demand management options, including responses to future material reductions in supply;
- develop the treated and untreated water delivery system. This involves assessing the network's existing capacity and condition, and identifying emerging planning issues and appropriate capital or operating responses;
- manage water quality. GAWB is required to maintain acceptable water quality for customers and for discharge; and
- manage the water distribution system. GAWB must operate and maintain a water distribution network of pump stations, pipelines and reservoirs.

2.2 Assets

GAWB owns and operates:

- the Awoonga Dam on the Boyne River in Calliope Shire;
- delivery pipelines, being 147 km for delivery of untreated water to treatment plants and industrial customers and 58 km for delivery of treated water to the Gladstone City Council (GCC) and Calliope Shire Council (CSC) water reticulation systems and to other industrial consumers;
- water treatment plants in Gladstone City and at Yarwun in Calliope Shire;
- untreated water pumping stations at Awoonga and Boat Creek, and treated water pumping stations at Benaraby, Calliope, Glen Eden and Boat Creek;

- Gladstone Water Treatment Plant (High Lift & Low Lift) and Yarwun Water Treatment Plant;
- untreated water reservoirs at Boat Creek, Gladstone (Fitzsimmons Street) and Toolooa, and treated water reservoirs at Boyne Island, East End, Golegumma and South Gladstone;
- the Lake Awoonga Recreation Area adjacent to Awoonga Dam; and
- a fish hatchery in Gladstone City.

2.3 Customers

GAWB currently supplies approximately 55,000ML per year to existing customers. Supplies to power stations in the Callide Valley comprise approximately 40% of total demand. Rio Tinto Alumina (RTA), Gladstone Power Station, Orica, QAL and Boyne Smelters account for a further 40%. Residential and commercial customers within the Gladstone City and Calliope shires account for the remaining 20%.

2.4 Commercial Arrangements

Past Practices and Contractual Arrangements

GAWB's pricing policy has evolved since its inception, reflecting changes in funding requirements and Government policy over that period.

In 1976, the Queensland Government approved a pricing policy essentially based on cost recovery principles designed to recover the actual costs of GAWB's operations and maintenance, and actual interest and redemption associated with the proposed capital works program.

In the 1980s, the pricing policy was modified to explicitly include return of capital, with assets depreciated over 20 years. New customers were required to contribute to any augmentation. In 1991, the pricing policy was again refined for new customers.

GAWB's previous water supply agreements typically included a specified volume, referred to as a 'deemed quantity', and a price per megalitre which was indexed each year by the CPI. Customers were typically contracted to minimum 'take-or-pay' arrangements requiring them to pay for 75% to 85% of the deemed quantity.

The terms of existing contacts varied from 1 to 30 years or, in one case, in perpetuity. Their pricing policies and conditions differed depending on when the contacts were struck.

Since October 2000, when GAWB became a commercialised entity, it has sought to establish a new pricing framework which reflected COAG water pricing principles. The Authority was directed to investigate GAWB's pricing practices and provided final recommendations to Ministers in 2002.

The pricing framework has since been the subject of a further investigation by the Authority as part of the 2005 pricing investigation, which built on the Authority's 2002 recommendations. GAWB has commenced implementing the Authority's recommendations with the development of a new contractual framework.

Contractual Arrangements

GAWB has not yet completed the process of transitioning its customers from previous contractual arrangements to arrangements which reflect the Authority's most recent pricing recommendations.

GAWB has advised, however, that its current contractual framework has been established in line with the Authority's pricing principles. This consists of two forms of contract, a Storage Contract and a Transportation Contract.

The Storage Contract details the terms and conditions under which GAWB will provide agreed quantities of water. The Transportation Contract details the terms and conditions upon which GAWB will deliver water via its pipeline infrastructure to the point of supply to the customer.

Specific customer requirements are incorporated into the terms of the agreement through commercial negotiation. The key elements of GAWB's standard product offering (as reflected in the new contracts) include:

- while GAWB currently supplies its customers exclusively with water from Awoonga Dam, the contract provides that, at GAWB's discretion, one or more additional sources of water of comparable quality can be sourced;

- the Reservation Volume, which is the customer's best estimate of water it will consume in that financial year, is the contracted amount that forms the basis of fixed charges payable by customers. Customers can reduce or increase their Reservation Volume in accordance with mechanisms contained within the agreement;

- customers can trade water that is not required within their Reservation Volume (subject to the reasonable consent of GAWB);

- GAWB must act as a reasonable and prudent operator in providing services under its contracts; and

- customers ultimately bear the economic risk of supply shortage caused by falling levels of water storage arising from drought, and GAWB has certain obligations and rights both under the contract and the Act to manage supply availability in such events.

3. PRUDENCE OF THE PROPOSED CONTINGENT SUPPLY STRATEGY

The Ministerial Direction requires the Authority to investigate the appropriateness of GAWB's recovery of proposed preparatory expenditure from existing and future customers with specific regard to the prudence of GAWB's contingent supply strategy. The contingent supply strategy nominated by GAWB is the supply of water from the Fitzroy River. However, GAWB also considers that further expenditure is warranted to assess the feasibility of a local desalination plant.

GAWB has requested that the Authority endorse the principle that the contingent supply strategy and (associated) preparatory expenditure is appropriate and prudent for the 2010 price review.

GAWB has identified the key risks which warrant a strategic response and associated preparatory expenditure as being related to changes in demand, hydrology and drought. The Authority notes that historically, GAWB's estimates of prospective demand for water from new projects have generally proven excessive. A range of demand scenarios has therefore, been considered in assessing the prudence of response strategies.

The Authority has concerns that the preferred option may be biased by the relative level of effort directed to the Fitzroy option as opposed to other options – particularly desalination.

The Authority considers that, under the worst case scenario postulated by GAWB (the average of the 3 consecutive worst inflows), there is sufficient time to undertake further investigations of potentially available options.

However, as noted by GAWB, there is a possibility of an unpredicted event, such as one or more years of even lower inflows or, for example, a failure in inflows in the coming wet season. The range of options which could be implemented to avoid failure in supply in such circumstances is currently limited to the Fitzroy Pipeline. In this regard, if rains fail this summer, the period of time available to respond thereafter reduces significantly as options such as harsher DMP restrictions and air cooling may not buy sufficient time to allow supply augmentation to be implemented. Under this scenario, desalination as a first response is also problematic given the planning lead times, environmental issues and construction period (3 years).

As a result, the Authority considers that it is prudent to continue working towards implementing the Fitzroy Pipeline option to manage the risk of zero or minimal inflows over the coming wet season. In addition, effort should also be directed towards other options such as desalination, air and sea water cooling and alternative supply restrictions in the event that inflows are sufficient to provide the necessary window for more comprehensive analysis of these options.

At the same time the demand/supply situation should be kept under active review and the level of preparatory expenditure on the Fitzroy Pipeline should be reconsidered if circumstances allow for more time to review other options.

3.1 Background

The Ministerial Direction requires the Authority to investigate the appropriateness of GAWB's recovery of proposed preparatory expenditure, specifically having regard to the prudence of GAWB's contingent supply strategy. The contingent supply strategy nominated by GAWB is to access water from the Fitzroy River by pipeline. However, GAWB also considers that further expenditure is warranted to assess the feasibility of a local desalination plant.

GAWB has, in turn, requested that the Authority endorse the principle that GAWB's contingent supply strategy is appropriate and prudent for the Authority's 2010 price review.

While GAWB has not defined 'contingent' in the context of its proposal, its submission focuses on the need for a timely response to potential identified risks which did not previously feature in longer term planning. That is, the contingent supply strategy is effectively a response to prospective risks, and is contingent upon them being realised. The identified risks relate to demand spikes, hydrology changes and drought and, because of their potential imminence, imply the need for timeliness of response.

3.2 General Approach

The prudence of any strategic response by GAWB (be it related to demand management or supply augmentation) can be expected to be affected by a wide range of factors including:

- consideration of what constitutes prudence;
- the relevant risks and their probability;
- estimates of demand and supply; and
- the alternative responses available.

3.3 Prudence

GAWB submitted that the traditional approach to managing water supply systems involves:

- holding significant spare capacity to cope with inflow fluctuations and unexpected demand growth;
- defining source yields conservatively, based on worst case historic inflows; and
- imposing restrictions in unusually severe droughts or other emergencies.

GAWB considered that this traditional approach is inappropriate to meet the varied supply security standards of its urban and industrial customers.

GAWB submitted that the spare capacity that it would be required to hold is very large compared to other water businesses. In addition, the cost of holding such spare capacity is very significant as the cost of future supply far exceeds that of the existing supply.

GAWB also submitted that prudent preparatory expenditure can provide financial savings by avoiding the costs associated with fast-tracking project delivery and can reduce the risk of subsequent project delay. A contingent supply strategy with a 24-month construction timeframe is nominated by GAWB as having the capability to significantly reduce the risk of supply failure.

Other Jurisdictions

The issue of prudence has been variously approached:

- in the US, investment decisions of a utility are presumed to be prudent unless the contrary is substantively demonstrated. To establish imprudence it is necessary to show that the investment was unreasonable under circumstances that were known or knowable at the time the decision to invest was made;

- in the United Kingdom, the Office of Water Services (Ofwat), while not specifically defining prudence, requires providers to demonstrate the need for increased reliability (or service standard) and evidence of customer willingness to pay;

- in Australia:

  – to establish prudence under the National Electricity Code, an ex-ante assessment must be undertaken before an investment is made to determine whether it is necessary and/or desirable. An ex-post assessment is then made of the actual investment undertaken; and

  – the ACCC's Statement of Regulatory Principles states that expenditure is recognised provided it is incurred efficiently, in accordance with good industry practice and achieves the lowest sustainable cost of delivery (although the term prudent is not employed).

Stakeholder Submissions

Stakeholder submissions did not focus on what constituted a 'prudent' response but rather focused on GAWB's proposed response.

QCA Analysis

The Authority notes the various approaches to prudence and that there is no universally accepted regulatory definition of prudence. In a legal context, the Federal court[1] recently defined 'normal prudential requirement' by reference to standard Dictionary definitions. The Oxford Dictionary defined prudence to ascribe the characteristics of 'foresight and careful deliberation' while the Macquarie Dictionary added references to 'cautious, practical wisdom, good judgement and discretion, care in economy or frugality'.

Conclusion

In assessing the prudence of alternative responses to the perceived risks, the Authority proposes to consider, inter alia, whether the proposed response is reflective of the relevant risks and is cost effective.

In the context of a contingent supply strategy, the concept of prudence should also encompass the need for a response to be able to be delivered within a determined time period. In urgent or time limited circumstances, the range of prudent responses may be limited.

Adherence to such criteria should ensure that GAWB most effectively addresses its customers' demands. Any broader public interest matters can be addressed through relevant government policies and/or Ministerial Directions.

3.4 Assessment of Relevant Risks

GAWB has identified the following key risks confronting it:

- demand spikes associated with further industrial development in the region;

- changes in expectations of the supply capability of Awoonga Dam; and

[1] *Eden Construction Pty Ltd v State of New South Wales (No 2)* [2007] FCA 689

- potential drought risks.

Demand

GAWB's Submission

GAWB advised that it is currently obliged to supply some 55,000ML per year to existing customers. About 40% of this volume is supplied to power stations in the Callide Valley, a further 40% to industrial users (Rio Tinto Aluminium (RTA), Gladstone Power Station, Orica, Queensland Alumina Limited (QAL) and Boyne Smelters), and 20% to residential and commercial customers.

GAWB anticipated that it may be required to supply an estimated 20,000ML per year to projects considered to have a reasonable likelihood of proceeding, based on assessments received from the Gladstone Economic and Industry Development Board (GEIDB). These demands could emerge at or before 2011.

GAWB submitted that:

- growth in demand for its water has occurred in large increments based on major new industrial projects commencing operations in the region;

- the demand profile for GAWB is markedly different from that faced by metropolitan water suppliers servicing mostly residential and smaller-scale commercial demands; and

- Gladstone-based industrial customers require water as a key input on a continual basis, and have no tolerance to restrictions, while the Callide power stations have some lesser emphasis on reliability.

GAWB also noted that, given the lumpy nature of demand increases and the uncertainty of new industrial projects, it is not possible to forecast new demands with any certainty. GAWB thus did not provide detailed demand forecasts in its submission, but indicated that, although demand growth is certain, the timing and scale is not. Nevertheless, in response to a request from the Authority, GAWB has subsequently provided a range of such forecasts to the Authority for consideration.

Stakeholder Submissions

The GEIDB submitted that there is a diverse range of major industrial projects under study for the Gladstone area. Although the details of these projects were confidential, the GEIDB reiterated that there was a medium to high potential for additional demand of approximately 20,000ML per year to occur before the end of 2011.

In regard to specific customer demands, the key issues raised in submissions to the Authority were that:

- Gladstone Pacific Nickel (GPN) submitted that it was in the process of completing a feasibility study for a world-class nickel refinery in Gladstone; and

- QAL indicated that it required an uninterruptible supply of water for its production process and was concerned that the Fitzroy Pipeline would only benefit new customers.

Callide Power Management (CPM) submitted that it was concerned about GAWB's previous history of over-estimating demand to support its proposed capital investment programme.

QCA Analysis

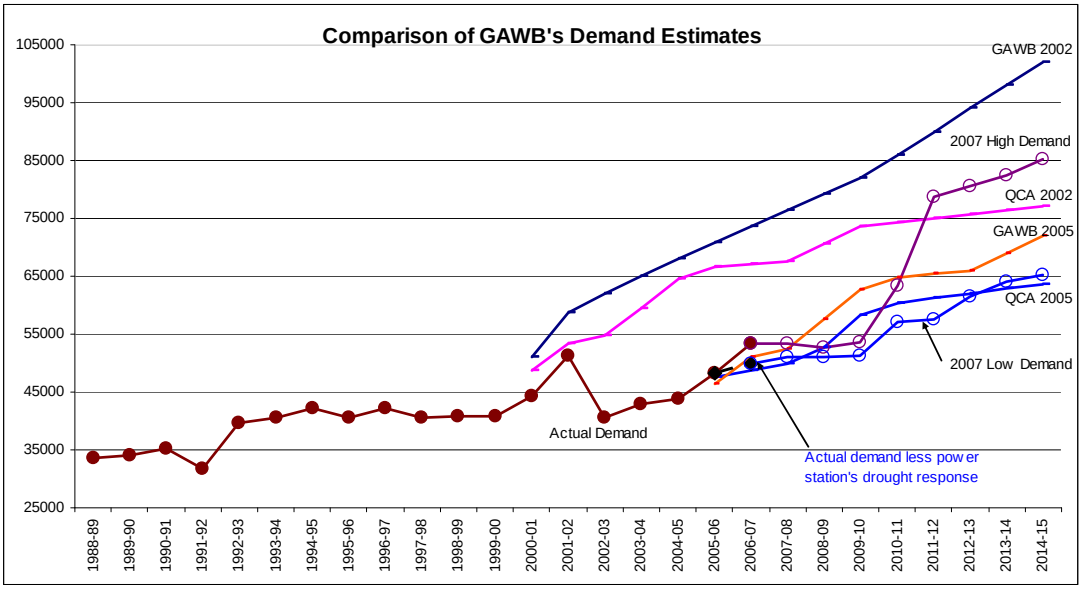
The Authority has sought to validate the immediacy of the prospect of new demand as well as the accuracy of past forecasts in seeking to verify whether an additional response is required to that offered by current infrastructure.

Previous Demand Forecasts

As noted by CPM, previous estimates of demand have traditionally exceeded actual demand. The Authority's 2001 Draft Report noted that, in 1990, water consumption was expected to grow to between 50,000ML per year and 80,0000ML by 2000 - however, the demand for water remained fairly constant at around 40,0000ML. More recent forecasts in 2002 by both GAWB and the Authority overestimated actual demand (Figure 3.1 below refers). It is recognised that, in respect of the 2002 forecasts, part of the over-estimation is due to the impact of permanent demand responses to the drought.

Demand in 2006-07 was slightly higher than forecast in the Authority's 2005 Preferred Planning Scenario due to higher than expected recent use by the Callide power stations as a result of an inability of SunWater to supply from Callide Dam due to drought.

Figure 3.1 Past Forecasts and Actual Demand



Current Demand Projections

A range of demand scenarios was considered by the Authority and, to assess their implications for the prudence of GAWB's proposed response, a high and low demand scenario was identified. These scenarios were generated on the basis of information provided to the Authority by GAWB and information from the Authority's consultants, Marsden Jacobs and Associates (MJA).

The high demand scenario incorporates an initial demand spike during 2010-11 and 2011-12 followed by long term average growth (of 3% compound growth per year for Councils and 3.5% compound growth for the industrial customers). The lower demand scenario reflects a preliminary assessment of new demands considered to have a high probability of proceeding.

The differences between the scenarios in the early years are not significant, as demand can be predicted with reasonable certainty over the next 3 to 4 years. Table 3.1 refers.

Table 3.1. Comparison of Demand Scenarios

Demand Scenario	*2007-08*	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2015-16*	*2020-21*
QCA Demand 2005	49,906	52,764	58,177	60,459	61,197	64,307	67,762
Low Demand 2007	50,966	51,024	51,208	57,143	57,448	65,535	72,644
High Demand 2007	53,337	52,775	53,682	63,260	78,654	88,036	104,079

Conclusion

The Authority accepts that GAWB's demand profile is different to other urban water supply entities, with potentially large and lumpy demand variations and with only about 20% of demand accounted for by the more predictable urban residential and commercial use.

The Authority has not sought to assign any level of probability to each of the demand scenarios identified but, on the basis of historical precedent considers that high demand scenarios are less likely. Such a conclusion is supported by preliminary consultations with customers. Furthermore, there is the possibility of demand responses by existing and prospective customers should the contingent supply strategy result in significant increases in the price of water.

The Authority's assessment of demand was not assisted by the fact that GAWB had not undertaken a detailed analysis of likely future demand from existing customers or sought independent assessment of likely future demand including a price sensitivity analysis. In this context, GEIDB should only be one source of information. This is an area to which GAWB needs to give greater attention in the future. In doing so, GAWB needs to take a balanced approach to demand assessment. While it is important to have water available to meet the needs of current and prospective customers, overestimation of demand leading to earlier than needed augmentation (and consequent price rises) can adversely impact on the attractiveness of Gladstone as an industrial destination.

Nevertheless, the Authority recognises that there is significant potential for demand forecasts to be inaccurate and it is appropriate that, in planning for the future, this uncertainty be taken into account.

Accordingly, the Authority has considered the low and high demand scenarios in conjunction with alternate supply scenarios in determining the prudence of the various response strategies further below.

Supply

(a) Current Supply

GAWB has advised that Awoonga Dam, which was raised to 40m AHD in June 2002, has a storage capacity of 770,000ML. The *Water Resource (Boyne River Basin) Plan (WRP) (2000)* which is based upon the Historic No Failure Yield (HNFY) of Awoonga Dam, permits a total yield of 78,000ML per year. However, until the dam overtops for the first time, GAWB's safe yield is limited to 70,000ML per year.

The HNFY is determined by modelling dam levels based on the available historical inflow data. The HNFY is the maximum amount of water that can be supplied annually without the dam

failing. The 'worst ten year' inflow is generally the 'critical' period in determining the HNFY and a new 'worst ten year' inflow is likely to lead to a reduction in HNFY.

(b) Hydrology Risk

GAWB's Submission

In its submission, GAWB advised that it had commissioned the Department of Natural Resources and Water (DNRW) to provide an analysis of issues relating to using past records for hydrological assessments. DNRW found that using HNFY to determine the appropriate yield has limitations for supply management. Particular issues were that:

- the methodology deals only with past rainfall sequences and provides little information regarding future supply performance, particularly if the climate is changing or fluctuations occur over long timescales;
- the historic record is quite short. Hence, there is always the possibility that a new record drought will occur within the short term;
- there is evidence to support that the climatic conditions used to calculate HNFY may be wetter than the average;
- the recently observed worse case sequence on record (1993-2003) is unlikely to represent neither the historical worse case nor the future worst case sequence. That is, if GAWB attempted to supply at the HNFY level it would expect a supply failure in the future; and
- any ongoing climate change associated with greenhouse gas emissions, stratospheric ozone depletion, increased sulphate aerosols over Asia and land-cover change may not be captured.

GAWB submitted that, since the early 1990s, the HNFY of Awoonga Dam has been revised downward on a number of occasions. If HNFY continues as the benchmark reliability standard, the volumes available from Awoonga Dam will reduce upon a new critical period occurring. GAWB proposed that inflows are uncertain, particularly for storages like Awoonga Dam, and there are hydrology risks associated with single-storage systems.

GAWB's SWP contained details of an analysis by SunWater of HNFY with failure defined as the level at which two years' demand remains in storage assuming minimum inflows. The revised HNFY under this scenario was 52,600ML, or about 67% of the current HNFY.

Stakeholder Submissions

CPM submitted that GAWB should be encouraged to deliver services which customers value in an efficient way. CPM further stated that customers are in the best position to judge their own expected costs from drought and their tolerance of supply risks.

GPN commended GAWB on its approach to fully accepting responsibility for water supply to the area.

QCA Analysis

The Authority notes that, since the last investigation, there has been no change to the Awoonga Dam's HNFY.

However, the Authority recognises that there is a risk that further downgrades of the HNFY could occur in the future. GAWB's submission indicated that there has been an apparent downward step-change in inflows in the Boyne River catchment since the late 1970's. However, it remains unresolved whether this is a result of random variability in the climate system, broad-scale fluctuations in the climate system or a more permanent trend or shift in the climate.

Research undertaken by CSIRO (2005) in relation to the adjacent Fitzroy Basin concluded that, between 1990 and 2030, the most likely change in mean annual inflows for the Fitzroy River due to climate change is -15% to +5%. The CSIRO (2005) study also indicated a propensity for more highly variable flows in the future, irrespective of changes in mean annual rainfall. Seven of the 12 models analysed by CSIRO (2005) indicated a future decline in rainfall for central coastal Queensland.

The Authority notes that the Awoonga Dam's HNFY has already been downgraded since the 2002-03 drought, from 87,900ML per year to 78,000ML per year. Hence, the 11% downgrade in HNFY may already reflect some of the changes anticipated by the CSIRO. Furthermore, a further reduction in HNFY is currently in effect in that the HNFY has been set at 70,000 until Awoonga Dam first overtops.

While there is some evidence of impending change, climate change science cannot at present predict future rainfall for specific catchments nor predict the severity of future drought events with high reliability. As such, it is not possible to determine the margin below HNFY (or a stochastically determined yield) that GAWB should adopt to reduce the probability of supply failure to some acceptable level.

Conclusion

Taking the emerging climate change evidence into account, and recognising that GAWB relies on a single storage source, the Authority accepts that a potential change to hydrology is a risk that GAWB faces, particularly if the current drought continues.

However, the magnitude or timing of any future adjustment (if any) is uncertain, particularly given the effective reduction in safe yield since the last drought of over 20%.

Until such time as the HNFY is formally re-assessed, it remains the appropriate measure for long term planning purposes. Furthermore, the Authority accepts GAWB's observation that the significance of HNFY reduces where GAWB has confidence that it can manage supply shortages.

(c) Drought Risk

GAWB's Submission

GAWB submitted that drought management is a central consideration, because the Awoonga catchment exhibits very large inter-year inflow variation. GAWB indicated that it supplies its customers under a contractual rights framework, and can therefore enter into specific arrangements for the management of drought events.

GAWB advised that, during the previous drought, leading up to February 2003, Level 2 restrictions were introduced requiring local governments to reduce water use by 50% and industrial customers by 25%. GAWB considered that the implications of this experience were that it:

- provided evidence of the uncertainty of inflows for storages relying on infrequent major flood events;

- highlighted risks associated with single-storage[2] systems. For example, water was available in neighbouring catchments such as the Fitzroy;

- resulted in revision of the reliability of supply, with the HNFY reduced from 87,900ML to 78,000ML per year;

- revealed the inadequacy of restrictions- based responses, which rely on the capacity of industry and local customers to curtail use; and

- supported a view that restrictions were applied too late and action should have been taken earlier to manage drought.

GAWB's submission indicated that, in March 2004, the Awoonga Dam storage peaked at 587,540ML equivalent to 36.94m AHD or 75% of its full capacity. GAWB advised that reserves as at March 2007 were 321,000ML or about 41% of total capacity of Awoonga Dam. GAWB noted that Awoonga Dam inflows in 2005 and 2006 were worse than any two-year sequence recorded.

According to GAWB's website, at 3 September, reserves were 278,687ML or about 36% of total capacity, and water levels were at 29.88m AHD.

Previously, GAWB's DMP of September 2006 determined drought response triggers on the basis of the average annual inflows in the worst ten-year sequence of inflows. At the time of the DMP (2006), the worst sequence was the period from 1993 to 2003.

The revised DMP (July 2007) adopts a trigger based on the average of the worst 3-year sequence of inflows rather than the worst 10-year sequence. GAWB has identified the worst 3-year sequence as being from May 2004 to April 2007 when inflows averaged 23,633ML per year. By comparison, the worst 10-year sequence, from 1993 to 2002, averaged 69,423ML per year.

The revised DMP trigger now assumes that inflows will be limited to the annual average of the worst 3 years (23,633ML per year) for the period that the DMP is enacted. However, GAWB was also mindful of the need to cater for an unpredicted event, such as one or more years of even lower (or zero) inflows.

Once the DMP is triggered, a regime of low supply alerts and restrictions applies over a five year period. The DMP provides for:

- Stage 1 - 5 years from supply failure[3], a low supply alert notice to customers, encouraging voluntary demand management strategies;

- Stage 2 – 4 years from supply failure, restrictions are applied at 10% of customers' reservation volumes; and

- Stage 3 – 6 months from failure date, municipal customers would be restricted to 50% of reservation volume, while industrial and other customers will cease to be supplied with water.

[2] While single-storage systems was the term used by GAWB, the context implied they were referring to single-catchment systems.

[3] Supply failure occurs when supplies fall below dead storage or levels below the lowest off-take.

Stakeholder Submissions

The key comments from stakeholders were that:

- CPM noted the critical value is future inflows which could be either lower or higher than the worst 10 year sequence of inflows on record; and

- CS Energy submitted that, based on data supplied by GAWB in its DMP, the existing storage is in a sound position, even when assessed against the worst 10-year sequence on record. CS Energy concluded that there is no apparent urgency to undertake the augmentation.

Other Jurisdictions

There is some variation in approaches used in other jurisdictions for determining response triggers:

- in Western Australia, the Water Corporation proposed to use an average of the worst 6 years of inflow data and a 1 in 200 year (0.5%) probability of imposing a total sprinkler ban. However, the Economic Regulation Authority (ERA) stated in it 2007 Final Report that it considered the Water Corporation's water source planning assumptions were overly conservative; and

- historically, the Victorian Government (DSE, 2007) used the average inflows from the past 100 and the worst 10 years to guide their water supply planning for Melbourne. However, in response to climate change and rainfall uncertainty, the Victorian Government developed a new scenario that envisages a repeat of the past 3 years' inflows. The Victorian Government claims that being risk adverse and prudent makes good sense and will adopt it as a basis for water supply planning for Melbourne.

QCA Analysis

Drought is an important risk facing GAWB, particularly given the reliance of the Awoonga Dam on low frequency major inflow events. The risk is exacerbated by its need to meet the continuous water supply demands of some of its industrial customers in the metals processing and electricity generation industries.

Drought risk can be addressed through supply restrictions under GAWB's DMP, supply augmentations or other strategies.

The Authority recognises the uncertainty regarding the most appropriate basis for estimating GAWB's future flows when considering responses to droughts. Such uncertainty is underlined by continuing drought conditions in Queensland and the inherent difficulty of weather forecasting.

In addition to the worst 3-year consecutive average inflow assumption adopted by GAWB, other options could include an unpredicted event, such as one or more years of even lower inflows, a 6-year average sequence of worst inflows (considered in WA) or a 10-year average (previously used by GAWB).

For the purpose of triggering GAWB's DMP, a short term focus seems appropriate as this will lead to an earlier imposition of restrictions. In this regard, it is noted that one of GAWB's conclusions from its last drought was that restrictions were applied too late and action should have been taken earlier to manage drought. Accordingly, the Authority considers the use of the worst 3-year consecutive average inflow to be prudent for the purpose of triggering the DMP.

However, the appropriate inflow assumptions for triggering supply responses are another matter. Supply increases are usually more costly than supply restrictions, particularly restrictions imposed on urban consumption. Furthermore, while supply restrictions can be removed at no cost, the same is not the case for supply increases. New supply still has to be paid for even if it is no longer needed.

Accordingly, the Authority also modelled six and 10-year flow scenarios when considering possible supply responses.

Conclusion

For the purposes of stage (a) of the investigation, the Authority considers that the prudence of the contingent supply option should be assessed by reference to a range of inflow assumptions. Other things being equal, the longer the period over which worst inflows are averaged, the less urgent the need for detailed planning of contingent responses.

At the same time, the Authority accepts that GAWB's proposed average 3-year worst inflow scenario represents a suitable worst case scenario but cannot discount the possibility of lower inflows (which would be of particular relevance should they occur over the next 12 months).

The trigger to be adopted for the contingent supply strategy is a matter for stage (b) of the investigation.

3.5 Demand-Supply Balance

GAWB's Submission

GAWB submitted that it can currently contract up to approximately 70,000ML per year based on its existing safe yield (that is, based on the current 10-year worst inflow assumption), compared to current contracted demand of around 55,000ML per year. Current spare capacity available for new customers is thus 15,000ML per year.

GAWB indicated that there is a possibility of supply failure early in 2011 due to one or both of drought (based on a 3 year worst consecutive inflow scenario) or demand spikes from new investment in the region.

Stakeholder Submissions

GEIDB submitted that a future increase in industrial demand, potentially reaching 20,000ML per year, may result in a water supply deficit of 6,000ML per year by 2011. GEIDB argued that a supply augmentation of 30,000ML per year by 2011 is required to ensure that a water supply deficit does not occur and that a reasonable reserve margin is maintained.

GEIDB stated that it believes that the investment attractiveness of Gladstone would suffer heavily if spare capacity falls to 7,000ML per year.

However, GEIDB notes that infrastructure supply augmentations need to be under study concurrently with the study of major industrial projects. Otherwise, the timing of the infrastructure augmentation runs a high risk of being misaligned with the needs of the industrial projects.

QCA Analysis

Current Water Allocation

The current water allocation, which is based on the worst consecutive 10-year inflow, is 78,000ML per year. However, the safe yield is capped at 70,000ML per year until Awoonga Dam is overtopped.

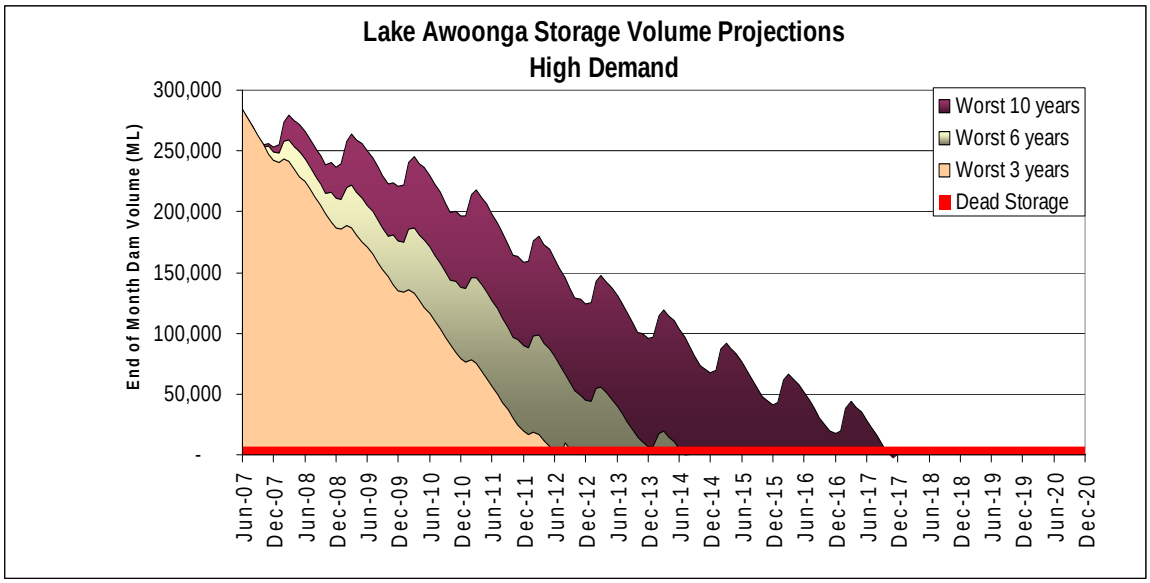
With current commitments at approximately 55,000ML per year, GAWB has some 15,000ML of available supply remaining in Awoonga Dam to service new customers until Awoonga Dam is overtopped, with another 8,000ML becoming available once that occurs. Historically, while demand increments have been lumpy, the maximum single step up in demand has been of the order of 11,000ML while the maximum growth in demand over a 5 year period has been of the order of 17,000ML. Furthermore, experience with new customers is that delays of up to 10 years can occur from when a project is first mooted to when demand commences. Furthermore, even after firm decisions are taken, a major new customer would normally have a lead-time of at least 3 years. Therefore, even if new customers emerge requiring all of the remaining capacity, the lead-time for the uptake of the new volumes, together with the existing supply buffer, should allow GAWB sufficient time to plan for an augmentation.

As such, no action is currently needed to increase supply to meet likely future demand per se. However, the current water allocations are based on the worst consecutive10 year inflows and there thus remains the potential need to increase supply to address the current drought.

Drought

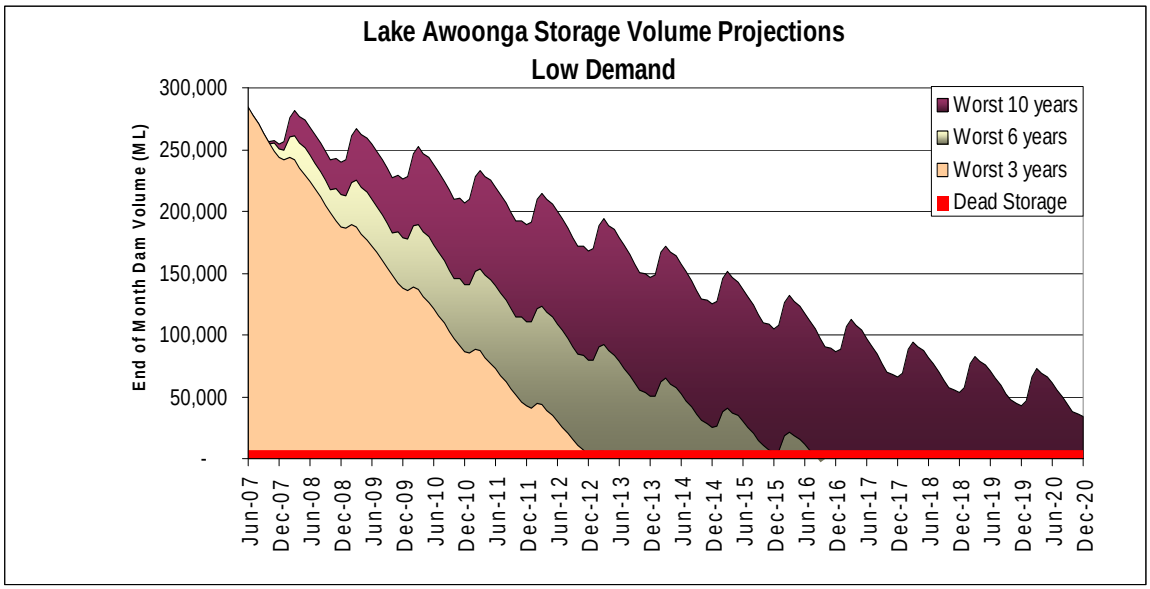
The assessment of the demand-supply balance with regard to immediate drought risks is based on current storage levels of Awoonga Dam. Based on the high demand scenario outlined earlier, GAWB's supplies of water could fail in 2012 if inflows consistent with the worst 3-year sequence prevail. These dates take into account supply restrictions under GAWB's current DMP. Figure 3.2 refers.

Figure 3.2 Projected Awoonga Dam Failure – High Demand Scenario and Various Inflow Scenarios



Should the lower demand scenario prevail, the timing of supply failure does not alter significantly if it is assumed that inflows are limited to the worst consecutive 3-years, as the differences between the demand scenarios are relatively minor in the early years. Figure 3.3 refers.

Figure 3.3 Projected Awoonga Dam Failure – Low Demand Scenario and Various Inflow Scenarios



The impact of the demand assumptions (high and low) is more significant for inflows corresponding to an average 6-year or 10-year worst inflow sequence. For example, as Figures 3.2 and 3.3 show, with inflows equal to the worst consecutive 6 years, supply failure occurs in late 2013 with the high demand scenario and mid 2016 with the low demand scenario.

Conclusions

Should normal conditions prevail, neither the high growth or the low growth scenarios imply an immediate need for supply augmentation.

However, continuing drought represents a risk that GAWB must actively manage. In this regard, a combination of the high demand scenario and inflows based on the worst 3 consecutive years provides a potential worst-case. Under this scenario, supply failure does not occur until 2012 and somewhat later if a more aggressive DMP is put in place.

However, given the vagaries of current climatic conditions, the possibility of a failure in inflows in the coming wet season cannot be entirely discounted and it would be imprudent not to keep such a possibility under active consideration.

At the same time, it should be clearly recognised that the continued assumption of inflows at the worst 3 consecutive years level would represent a paradigm shift in supply and would be inconsistent with current demand obligations, requiring action significantly in excess of the proposed contingent supply strategy.

3.6 Preferred Response

GAWB's Submission

GAWB has identified the range of possible responses including demand management or on-site supply initiatives (including air-cooling of power stations), volumetric charging, secondary trading, supply restrictions, development of an additional source or buffer supply (including desalination plants), and development of a contingent supply strategy (involving preparatory works in advance).

Demand Management

GAWB submitted that low cost demand management opportunities have already been pursued and that remaining demand management options are of limited scale and high cost. These included plant refinements to reduce water losses, early implementation of a treated effluent reuse scheme, several water re-use projects and refinement of cooling processes to increase the number of cooling cycles. GAWB considered that its industrial customers now have a limited capacity to achieve further reductions in water use, as improved water efficiency practices were implemented in response to the 2002-03 drought. However, this excludes large scale options such as air cooling or sea water cooling in power stations and some industrial plants.

GAWB's Strategic Water Plan (SWP) examined supply substitution options including seawater cooling and air cooling. In the case of the latter, GAWB concluded that air cooling on current technology involved high capital and operating costs relative to the volume of water saved and ranked close to the bottom of any list of future investments for GAWB.

In a supplementary submission to the Authority, GAWB indicated that demand-side measures, such as funding or contributing to converting power stations to air cooling, provide no diversification benefits such as can be achieved by sourcing additional water from a different catchment. GAWB also submitted that it was concerned that it could not control the outcomes of demand management strategies, and that there was uncertainty about the longevity of the benefits as the power stations are likely to have lives substantially less than the Fitzroy infrastructure.

GAWB also noted in its submission that all new water users have options to bypass GAWB's infrastructure and develop alternate solutions. However, GAWB also noted that these opportunities were usually local in nature and many opportunities, such as treated effluent re-use, have already been exhausted.

Volumetric Charging and Trading

GAWB indicated that it has already exploited strategies such as volumetric charging and secondary trading following the Authority's previous reviews.

Supply Restrictions

GAWB submitted that the Gladstone based industrial customers have little tolerance for restrictions of either volume or duration. By comparison, GAWB indicated that the Callide power stations have a lesser emphasis on reliability, and are able to scale down their activities in response to water restrictions.

Supply Buffer

GAWB submitted that the option of maintaining a supply buffer in Awoonga Dam does not provide benefits in terms of diversification of water supply.

Contingent Supply Strategy

GAWB indicated in its submission that greater emphasis is now being given in best practice water supply planning to:

- using a level of service approach to benchmark the reliability of supply to consumers and inform planning assessments of the need for new sources;
- clearly identifying the next water source to meet demand growth and sustain the required level of service;
- diversifying the sources of water to reduce supply risks (such as those caused by drought); and
- conducting preparatory works to reduce the lead times for development of these sources and improve the utilisation of existing sources.

GAWB considered that identifying the next source and reducing the lead-time for development provides the most cost effective approach. It enables better utilisation of existing sources, as potentially greater volumes can be supplied in the knowledge that a contingent supply strategy is available to meet customer needs in the event a severe drought emerges.

Other Jurisdictions

GAWB's submission noted a number of examples where water service providers have undertaken planning and preparatory expenditure for contingent supply strategies:

- Sydney's Metropolitan Water Plan (2006) incorporated preparatory expenditure for contingent sources that could be deployed in the event of a drought, including a desalination plant and groundwater drilling. The Authority notes that IPART (2005b) recently approved expenditure on initial costs for the Sydney Water desalination plant, but noted that actual expenditure would be reviewed as part of the next review;
- Perth's water source plan to address demand through to 2050, included planning, investigation and approvals to progress long-term options ahead of time if required. The ERA (2005b) reviewed the Water Corporation's proposals and concluded that they appeared sound with some provisos in relation to service standards;
- the Queensland Water Commission is developing a water supply grid for South East Queensland; and
- the Victorian Government's water supply strategy for Melbourne (2007) includes identifying options to address resource needs.

Short-term scarcity charges are in common use in the United States. For example, DenverWater (US) applies short-term surcharges to increase water prices during droughts to raise awareness of the value of water, to reduce water use and to penalise those who don't comply with drought restrictions. These surcharges are implemented as a temporary measure outside the cost-of-service rate structure, and are complemented by supply restrictions. Similar pricing arrangements apply in California and Nevada.

Stakeholder Submissions

Some stakeholders, including GEIDB, GPN, RTA, and CS Energy, generally supported GAWB's proposal to seek contingent supply strategy options. However, QAL submitted that GAWB's Fitzroy Pipeline proposal was foremost an augmentation to meet new demands and would provide only marginal indirect benefit for QAL in terms of supply security.

CS Energy indicated that it had, as part of its submission to GAWB on its DMP in September 2006, proposed that GAWB should undertake early works on supply augmentation options where warranted as a means of delaying the need to commit to augmentations as late as possible. This would involve undertaking long lead time but low cost planning efforts to reduce time required for reliability-based augmentations.

Alternative options to a contingent supply strategy were countenanced in some submissions:

- CS Energy's submission to the Authority proposed that trading of water allocations could yield considerable savings in years in which water is scarce. However, the trading option was considered by QAL as unlikely to be borne out in practice, as the contractual entitlements are inferior in title, negotiability and procedure to water allocations under the *Water Act 2000.* QAL noted that there could be enhanced trading opportunities if the Boyne and Fitzroy catchments were operated as a single system;

- while RTA was a strong supporter of the plan to develop a contingent supply strategy, it considered that it would be prudent for GAWB to have processes in place to continually review other options, including options for reducing water consumption or providing alternative sources;

- CSC noted that GAWB's DMP always recognised that domestic consumers have a greater ability to reduce consumption in times of drought than major industry which could be forced to shut down. During the last drought, industrial customers were required to reduce consumption by 25% while residential customers were required to reduce consumption by 50%. This was supported by Councils and residents at the time; and

- CPM and CS Energy submitted that GAWB should consider air cooling one or more of CPM's and/or CS Energy's generating units. They both argued that air cooling is cost-competitive with the Fitzroy Pipeline, with advantages in scalability. For approximately $50 million per unit or roughly double GAWB's proposed preparatory expenditure air cooling would reduce demand on GAWB's supplies by 5,000ML per year per unit. CPM suggests that this could be implemented within 12 months.

  Further, CPM submitted that air cooling would defer failure thereby increasing the probability of the occurrence of a significant rainfall event which would mitigate the need for a contingent supply strategy. It would also provide more time to consider other options such as desalination. CPM's view was that the Authority must demonstrate that the value of air cooling is inferior to the Fitzroy Pipeline preparatory expenditures.

RTA supported the principle of a water supply grid connecting water supply assets to mitigate supply risk.

QCA Analysis

Demand Management and On-site Supply Options

The Authority is unaware of any unexplored low cost demand management opportunities. However, high cost options such as air cooling of the Callide power stations and sea water cooling of other customers' industrial facilities have been identified as having the potential to reduce existing demand. Customers may be also encouraged to initiate strategies to reduce their own water costs, particularly if the alternative is for significantly higher charges for water. The Authority understands that some such options could be implemented relatively quickly and could provide sufficient capacity to defer significant capital expenditure. The Authority therefore considers that these options should be addressed by GAWB with its customers.

GAWB's concerns that it does not control its customers' investment decisions is not a sufficient reason to eliminate such large scale demand management options from further consideration, as any arrangements could forestall expensive augmentations and, if implemented unilaterally by customers, would impact on forecast demand. GAWB could negotiate contractual terms in regard to the operation of such arrangements. It is accepted that such strategies do not diversify sources. Nevertheless, they do reduce demand which reduces the need for new and diverse sources.

The potential for air cooling of power stations to defer dam failure and thus defer capital expenditure and increase the time available for further assessment is examined below.

Supply Restrictions, Volumetric Charging and Trading

GAWB's case against supply restrictions, volumetric charging and trading are that these are already in place, do not meet customers' needs or do not provide a diversity of supply.

The Authority accepts that GAWB has already exploited strategies such as supply restrictions through their DMP process. However, the current DMP is relatively relaxed, with only 10% restrictions until 6 months before failure. Calliope Shire Council (CSC) has indicated that it is prepared to accept a higher level of supply restrictions than currently proposed in the DMP. A higher level of restrictions introduced earlier could prolong Awoonga Dam supplies by up to 12 months. As with air or sea water cooling, deferring dam failure by this period would increase the probability of the occurrence of a significant rainfall event which would mitigate the need for a contingent supply strategy. It would also provide more time to consider other options such as desalination. Therefore, the Authority considers that GAWB should re-examine its DMP supply restriction regime.

The Authority is also aware that GAWB has initiated steps towards volumetric charging and secondary trading following the Authority's previous reviews. However, the Authority notes that GAWB has not implemented drought surcharges such as those applied in the US. Such scarcity-based charges may have relevance under drought circumstances and were suggested by the Authority in its previous investigation.

Further, the Authority notes that secondary trading has not occurred, potentially because customers do not hold separately transferable entitlements and trading must occur through GAWB. The Authority considers that GAWB could do more to encourage customers to consider trading, particularly to offset the costs of on-site demand management strategies. At the same time, the Authority notes that the small number of customers, with broadly similar water reliability requirements, is a constraint on trading.

Supply Buffer

A supply buffer could take the form of spare capacity in Awoonga Dam, or an additional water source (as distinct to a contingent supply strategy of initially investing in preparatory works only).

The Authority notes that GAWB already has a supply buffer in the form of spare capacity in Awoonga Dam. The Authority notes GAWB's view that maintaining a buffer in Awoonga Dam does not improve diversity of supply.

In other urban and industrial areas, there is a trend towards a combination of surface water, recycling and desalination sources, increasingly linked to a network or grid system.

While additional supplies are ultimately likely to be required, an important issue is the additional cost involved. Furthermore, there are no known sources of supply which could provide a supply buffer in the short term.

Contingent Supply Strategy

The Authority recognises that a contingent supply strategy which defers significant capital expenditure should be more cost-effective than maintaining a substantial buffer or capacity cushion. The objectives of such a strategy would be to minimise the lead time for construction of the infrastructure.

Such a strategy is consistent with strategies being adopted in other jurisdictions. The Authority also notes that, while customers generally supported a contingent response in principle, there is limited support for the Fitzroy Pipeline option among customers, largely because of customers' concerns centred around its cost implications. The impact on prices is reviewed in later sections.

Conclusions

In assessing the various options against the criteria for a prudent response, the Authority finds that most of the strategies can be further developed to improve the longer term demand-supply balance and provide at least short term relief from the need to incur potentially even higher costs associated with major supply augmentations.

The Authority considers that supply restrictions under the DMP which reduce consumption by only 10% over a 3.5 year period appear to be too conservative and that a progression to a higher level of restrictions would help to prolong supplies. This is particularly important as the demand-supply balance problem facing GAWB is predominantly drought driven and could quickly turn around. GAWB should investigate such matters in conjunction with its customers.

Demand management and on-site alternative supplies such as air cooling and sea water cooling can be implemented relatively quickly and may involve smaller incremental capital costs than supply buffers or contingent supplies. They could provide sufficient time to forestall expenditure which may become unnecessary should the drought conditions ease.

The Authority has analysed the expected impact on Awoonga Dam failure dates if air cooling of either 2 or 4 units of the power stations is in place from as early as July 2009, for various inflow and demand combinations. As with GAWB's analysis in its submissions, the Authority's focus is on a pipeline of 30,000ML per year. Table 3.2 refers.

If the worst sequence of 3 year inflows is assumed, the air cooling option with all 4 units in the Callide power stations can delay failure until August 2012 for the high demand case or August

2013 for the low demand estimates. This timing is not dissimilar to that which occurs with the Fitzroy Pipeline. Furthermore, air cooling appears capable of earlier implementation than the pipeline and, as such, seems to be an insurance against further deterioration of the drought while other alternative supply options, particularly desalination, are refined.

Table 3.2. Projected Awoonga Dam Failure – Alternative Scenarios

Demand Scenario	*Inflow Option*	*No Response*[1]	*Dry air cool 2 units*	*Dry air cool 4 units*	*Fitzroy Pipeline*
Deliverable by			July 2009	July 2009	July 2010
High Demand	Worst 3 year average inflows	Nov 2011	June 2012	Aug 2012	Dec 2012
	Worst 6 year average inflows	Aug 2013	Dec 2013	Oct 2014	Oct 2016
	Worst 10 year average inflow	Sept 2016	Oct 2017	Sept 2019	Aug 2023
Low Demand	Worst 3 year average inflows	Aug 2012	Dec 2012	Aug 2013	July 2015
	Worst 6 year average inflows	July 2015	Sept 2016	Aug 2018	Nov 2029
	Worst 10 year average inflow	Oct 2022	Dec 2029	No Fail	No Fail

1. The no response scenario assumes no supply restrictions under the DMP.

While demand management, supply restrictions, volumetric charging and trading can help manage drought risk by deferring demand, only measures such as a supply buffer or a contingent supply strategy would seem appropriate if climatic conditions do not improve and high demand occurs over the longer term.

Industry standards appear to be moving towards the concept of diversified sources and contingency responses in the face of drought and long term climate change risks. By comparison to supply buffers, the option of a contingent supply strategy should, by definition, be more cost effective.

The Authority therefore considers that a contingent supply strategy is appropriate as it enables GAWB to be prepared to implement a supply solution within a 2-year period, and before the Awoonga Dam would fail. By deferring the actual augmentation as late as practical, the contingent supply strategy should result in a more cost effective response.

3.7 The Proposed Contingent Supply Strategy

Evaluation Process and Criteria

GAWB's Submission

GAWB's analysis of different supply options draws on its original SWP which assessed a range of augmentation options in 2004.

GAWB's SWP evaluation criteria were developed in consultation with its customers to establish the preferred supply options, which were (weightings bracketed):

- the reliability of additional water provided (35%);
- quality of water (20%);
- environmental impacts (10%);
- social impacts (10%); and
- selling price (25%).

While GAWB's submission drew on the outcomes of the SWP, it also applied additional criteria to the options to determine the appropriate contingent supply strategy as distinct from a planned augmentation. GAWB applied a key threshold criterion requiring that the contingent supply strategy has the ability to provide water within two years of construction being commenced. The bases for this criterion were that:

- a two-year period is the likely procurement, construction and commissioning period for various options; and
- GAWB and its customers can be confident that the source can be delivered on time, with critical path items being resolved such as land acquisition and approvals.

The 2-year timeframe was also set to allow GAWB to respond to the likely lead-time for new (industrial) demands and to be consistent with the timeframe necessary to access emergency supply of water in the case of a severe drought.

GAWB further submitted that, without the introduction of an additional source, there is a possibility of supply failure in early 2011, due to one or both of drought and demand spikes from new investment in the region. A threshold criterion for evaluating options was therefore that water should be able to be supplied in 2010.

Further key threshold criteria were in regard to:

- GAWB's ability to maintain control over the inception and delivery of the contingent supply strategy;
- the ability of the contingent source to provide diversification in supply; and
- the ability to provide wider regional benefit.

Finally, GAWB applied further measures as part of its assessment of the options, which included:

- annualised cost over the life of the project, assuming full capacity;
- risk to cost, a qualitative measure taking into account a combination of the level of investigation and the potential for changes to cost assumptions; and
- environmental and social impacts.

The final ranking of surviving options was based on a subjective analysis against these criteria rather than any scoring methods as was used in the original SWP.

Stakeholder Submissions

CS Energy was generally supportive of GAWB's efforts to enhance water system reliability. However, CS Energy argued that such efforts must be economically justified and its view was that GAWB's proposal does not provide that justification. CS Energy submitted that GAWB's proposal was based on the outcomes of a 'coarse multi-criteria analysis', and does not provide a cost benefit analysis.

CPM also expressed concerns regarding GAWB's evaluation framework. According to CPM:

- GAWB's evaluation framework was not sufficiently robust, nor applied impartially, to justify the investment being considered;
- GAWB's evaluation criteria are duplicative and repetitive, and the relevance of some is dubious, such as 'wider regional benefit' criterion used in GAWB's updated evaluation. CPM considered that 'wider regional benefit' and 'social impact' may cover similar ground; and
- the use of annualised $/ML figures is misleading, as it assumes full operation immediately upon commissioning. This biases against more scaleable options such as air cooling of the power stations and desalination.

QCA Analysis

The Authority notes that there are potential issues and shortcomings with utilising Multi-Criteria Analysis (MCA), including:

- the selection of criteria (ensuring the criteria set is complete, that all criteria are necessary and that there is no double counting);
- choice of scores and weights;
- the need for sensitivity analysis;
- limitations of potentially subjective judgements; and
- the possibility that stakeholder preferences will be determined by a single decision-maker, without consultation.

In relation to these issues, the Authority considers that GAWB's evaluation framework was reasonable at the time of the SWP to narrow down the plausible range of options, with the criteria and weightings for the MCA established on the basis of a customer survey. GAWB also undertook sensitivity analysis and found that the ranking of options was sensitive to reliability. GAWB also concluded that large changes to cost assumptions would be required for the preferred options to be outscored.

In its submission to the Authority, GAWB has applied further threshold criteria which have a critical impact on GAWB's selection of a contingent supply strategy. In relation to these key criteria, the Authority's analysis indicates that:

- very few surface water supply options would be able to deliver water within 2 years of commencement, particularly allowing for filling time. The Authority notes that GAWB's revised DMP allows 4 years of supply restrictions, and supplementary measures could prolong the need for a response;

- the criterion that additional water be available in 2010 is not currently justified. The Authority's analysis of the worst case scenario involving a combination of drought and the high demand scenario, and allowing for supply restrictions under GAWB's DMP, indicated that supply failure could occur by mid 2012 (assuming the lowest 3-year average inflows);

- GAWB's ability to control the investment should not be regarded as a limiting factor. For example, an efficient option may entail a new supplier providing water to GAWB's customers from outside the region. GAWB can implement contractual arrangements to manage these matters; and

- the diversification criterion is considered to be relevant as a threshold criterion for supply options, as it specifically focuses on supply-side risks associated with hydrological changes or drought.

In relation to additional measures which were raised in GAWB's submission, the Authority notes that:

- while there is some duplication of assessment criteria, such as wider regional benefit and social impacts, these were not used as threshold criteria in GAWB's submission. The 'wider regional benefit' criterion refers to the potential for the new infrastructure to be integral to a regional water supply grid;

- the Authority accepts CPM's comment that the use of annualised cost estimates biases against scaleable options such as dry cooling (air cooling) and desalination. However, it is noted that GAWB has not used this measure as a threshold criterion but has used it only for comparison of the Fitzroy Pipeline with the desalination option which delivers the same volume of water. GAWB's annualised cost estimate was based on usage of full capacity of supply over the entire life of the assets; and

- the risk-to-cost variation measure means that GAWB considers that the risk of cost variation is greater for some options than others. However, each of the options includes allowance for cost over-runs.

GAWB's criteria do not include any assessment of the options in regard to their financial implications for GAWB. GAWB's submission does not review the effects on GAWB's cash flows, capital structure and interest cover, and any subsequent effects on GAWB's credit rating. While such matters may be encompassed in a subsequent submission by GAWB under Stage (c), they may have a bearing on the selection of the appropriate option.

Conclusion

The Authority generally finds GAWB's evaluation process, including the threshold criteria, to be reasonable in the context of assessing contingent supply strategies. However, the Authority considers that the ability of GAWB to control the investment should not be a threshold variable.

The Authority considers that, given the concerns of customers about cost, and the reduced number of available options as a result of the additional threshold criteria, GAWB's evaluation process should include a more detailed economic analysis of those supply options still considered to be eligible for consideration (see below discussion of the eligible options), as well as the impact of options which may defer more costly supply augmentations, is warranted.

An approach consistent with Treasury's *Cost Benefit Analysis Guidelines (2006)* would provide a clearer justification for the preferred option.

GAWB's evaluation should provide indicative pricing implications for the alternative options based on alternative demand scenarios. This would provide the relevant information to all parties to enable comparison of the financial risks of the alternative contingent supply strategies and confirmation of the preferred option.

The extent to which the financial implications for GAWB may differ under the alternative options may also be a significant factor warranting GAWB's further attention – the more time that is available for this purpose, the more detailed the analysis should be.

These investigations could be carried out in parallel to preparatory expenditures, to put in place one or a number of options that may be proven necessary.

There is also a need for GAWB to demonstrate that there is a significant level of customer support for its proposed contingent supply strategy, once customers have been made aware of the full pricing implications of the contingent supply strategy.

Selection of Contingent Supply Option

GAWB's Submission

GAWB's 2004 SWP examined 11 surface water options and two desalination options. Seven of the 11 surface water options were rejected at the first level of analysis. These included new dams on Diglum Creek, Calliope River (at Devils' Elbow), two sites on Raglan Creek and the Nathan dam site on the Dawson River. The reasons for rejection were various, including site limitations, impact on public infrastructure, high cost, and institutional constraints. As a separate exercise, GAWB examined the options of seawater cooling of coastal industrial facilities and air-cooling of the inland power stations, but dismissed these then on the basis of high capital and operating cost relative to the volume of water saved.

The remaining four surface water options were then expanded to 8 options to take account of different scheme scales, and the small-scale desalination option which provided only 7300ML per year was eliminated.

This resulted in nine options being ranked in GAWB's SWP as follows:

- the Fitzroy Pipeline connecting to a weir on the Fitzroy River supplying 20GL or 30GL (Options 1 and 2);
- a weir on Baffle Creek to 25m and connecting pipeline to Awoonga Dam;
- raising Awoonga Dam to 45m assuming no rail relocation costs are incurred;
- a weir on Baffle Creek to 20m;
- a large desalination plant;
- Castle Hope Dam on the Calliope River to 27m;
- Castle Hope Dam on the Calliope River to 35m; and
- raising Awoonga Dam to 45m, but with rail relocation costs being incurred.

Subsequent to the SWP, GAWB's evaluation, as outlined in its submission to the Authority, concentrated on the selection of an appropriate supply source which met the key threshold

criteria, that water be available within 2 years from construction, and that water be available from 2010-11. The options which met the new threshold criterion included:

- the Fitzroy Pipeline options, providing either 20,000 or 30,000ML per year;
- desalination using membrane technologies, providing 30,000ML per year;
- seawater cooling of the alumina refinery, providing 4500ML per year; and
- retro-fitting of air-cooling of the Callide power stations, providing up to 14,000ML per year.

The latter two options, which were eliminated in the original SWP, were reintroduced into the evaluation process in GAWB's submission. However, they were again eliminated on the basis that GAWB could not control their outcomes and they do not provide diversification benefits.

Therefore, under GAWB's revised criteria, only two options emerged as meeting the revised criteria as potential contingent supply strategy options – the Fitzroy Pipeline and desalination. GAWB indicated a preference for the Fitzroy Pipeline on the basis of slightly lower annualised cost and a lower risk that costs would be exceeded (the 'risk-to-cost' criterion).

GAWB also indicated in its submission that the raising of the Eden Bann Weir and/or the construction of the Rookwood Weir on the lower Fitzroy, which were necessary to provide storage volume to supply the Fitzroy Pipeline, would be completed by early 2011. Hence, there is a potential delay between the possible completion of the pipeline and the storages. In the interim, if water is required, GAWB needs to ensure that water is available from the Fitzroy River.

GAWB noted that the costs for the Fitzroy Pipeline have significantly increased under GAWB's revised plan, as compared to the SWP, from $93 million to $317 million (excluding the new weirs). The reasons as stated by GAWB for this increase included:

- allowances being made for water treatment and upfront contribution to augmenting the electricity network;
- a large increase in construction costs due to market conditions; and
- an increased allowance for contingent cost over-run (from 5% to 25% of capital costs).

In its supplementary submission, GAWB indicated that the increased estimate for the Fitzroy Pipeline is due largely to an increased understanding of the required parameters following more detailed investigation, more so than cost escalation, and that each of the other options hold the same risks given their lesser investigation.

GAWB also indicated that the weirs would add $28 million to the total cost (based on 2004 estimates) and a further $38 million could be incurred if the Fitzroy Pipeline was to be bi-directional.

The large desalination plant option has also escalated in cost, from $117 million to a mid-point estimate of $338 million, including a 25% contingent allowance. The reasons for this increase were:

- an increase in the capacity of the proposed plant to enable comparisons with the 30,000ML Fitzroy Pipeline option;

- a change in the assumed process from thermal to reverse osmosis; and

- updated construction costs benchmarked against new desalination projects.

GAWB noted that, in comparing the 2 remaining options, desalination involves greater operating and energy costs, and there is potentially greater scope for error in estimating the total cost of the desalination option. This was a key factor in favouring the Fitzroy Pipeline.

GAWB's submission identified the following benefits of the Fitzroy Pipeline option:

- it diversifies GAWB's drought risk between two catchments – the Boyne and the Fitzroy. The Lower Fitzroy is at the end of a very large catchment and receives steady inflows into relatively small storages, contrasting with Awoonga Dam which relies on less frequent, but major, inflow events;

- there is potential for bi-directional flow of the Fitzroy Pipeline to provide regional benefits by managing the Awoonga and the Lower Fitzroy storages as a single system. This would be at an additional cost, as it is not currently incorporated in expected capital costs;

- the pipeline can be scaled up to provide higher capacity by providing additional booster pumps and treatment capacity; and

- GAWB has the existing skills required to operate and manage the infrastructure.

In relation to the Fitzroy, GAWB submitted that the State Government has confirmed the need and timing for new storage infrastructure, including building Rookwood Weir and raising Eden Bann Weir, which will generate approximately 80,000ML of high priority water allocations. These weirs are planned to be in place by 2011. GAWB also separately advised that the Eden Bann Weir could be completed as early as July 2010, and the Rookwood Weir as early as December 2010, in the event of drought circumstances.

In the SWP, GAWB indicated that the mean annual diversion which remains unallocated in the Fitzroy River is capable of providing significantly in excess of 30,000ML per year of highly reliable water (better than 99% reliability). GAWB further noted that, given the Fitzroy River's very large streamflows, a future drought that led to streamflows being 20% lower than previously experienced would not reduce the Rookwood Weir's yield to less than 30,000ML per year. The Fitzroy River Weirs were expected to have a filling time of 0.8 years.

The pipeline from the Fitzroy River Barrage to Gladstone, and the raising of Eden Bann Weir and the construction of the Rookwood Weir were identified as key water infrastructure, that would form part of a state wide water grid, in the Government's 2006 Central Queensland Regional Water Supply Strategy (CQRWSS).

The CQRWSS was a coordinated regional approach to the sustainable and equitable allocation and best use of water to urban, industrial/mining and agricultural users in the Central Queensland region. The strategy was established in June 2004 in response to recent droughts to develop a whole-of-government approach to water supply challenges. A draft strategy was prepared in December 2005, with a final strategy released in December 2006 through a partnership process including state government agencies, local government, industry and community organisations.

The strategy, in relation to the Gladstone region, was heavily influenced by GAWB's 2004 SWP which itself was commenced eighteen months earlier in March 2003.

According to the CQRWSS, the conjunctive operation of the Lower Fitzroy and Awoonga Dam systems are expected to improve the overall performance of the region's water supplies and forms part of a whole of government response to the prolonged drought in Central Queensland. The CQRWSS also included a high priority allocation of 30,000ML per year of reliable water from the Lower Fitzroy to be reserved for GAWB.

According to GAWB, should inflows continue beyond 2010 consistent with the last three years, an additional augmentation may be required to supplement the Fitzroy Pipeline. GAWB proposes the trigger point of 48 months from failure to also govern any second augmentation to ensure security of supply to all customers. GAWB submitted that desalination represents its second planned augmentation and a decision may be required by as early as April 2009.

Therefore, GAWB considers it prudent to continue to gather further technical information on the desalination option, as part of preparatory expenditure on the contingent supply strategy. GAWB states that the scalability and potential for advantages in co-location with industry will be a particular focus of the investigation. This is to enable more fully informed future decision making.

Stakeholder Submissions

The GEIDB, GPN and RTA support GAWB's proposal to develop a contingent supply strategy from the Fitzroy River, including the need for preparatory expenditure.

GPN additionally recommended that an updated cost review of the desalination plant should identify capital and operating costs.

However, RTA also expressed concerns regarding the escalation in costs for the Fitzroy Pipeline, commenting that:

- it would be prudent for GAWB to have processes in place for continuing to review other options to ensure that the Fitzroy Pipeline remains the preferred option. GAWB and its key industrial customers should continue to review and discuss alternative options so that the prudence of the Fitzroy Pipeline option is continually challenged; and

- GAWB had not provided any indication, other than the capital cost, of the likely impact of the Fitzroy Pipeline on the long term cost of water in Gladstone. Without such information, RTA was not able to assess the value of its own options for drought proofing its assets as alternatives to the GAWB proposal.

Other customers, CSE, CPM and QAL also raised concerns over the escalation in costs of the Fitzroy Pipeline, the need to examine other options further and the degree of benefit to existing customers.

CS Energy noted that the significant increase in capital cost for the Fitzroy Pipeline may substantially change the economic rationale for the pipeline, including its ranking against alternatives and whether it is justified on a cost-benefit basis. CS Energy considered that the Authority should require GAWB to undertake a full cost-benefit analysis, including demand side options, before considering the matter further.

CPM raised issues about the application of some of the criteria to the alternatives, indicating that:

- there are only anecdotal claims that sourcing supply from an adjacent surface water catchment would boost reliability for GAWB's customer base. In addition, CPM argued that diversification does not imply a reliability improvement;

- desalination and dry-cooling were both rated worse on the 'risk to cost' criterion in GAWB's updated evaluation, with no clear justification for this and despite the preferred Fitzroy Pipeline's capital cost nearly trebling since GAWB's 2004 SWP; and

- the SWP's rating of desalination as less reliable than the Fitzroy Pipeline is debateable given that a desalination project can be designed to be sufficiently reliable to deliver drought mitigating water supply.

CPM also considered it misleading to emphasise the hydrological risks of the Awoonga catchment as justification for proceeding with a contingent supply option, without acknowledging that the same risks must now or in the future affect an adjacent surface water catchment.

QAL indicated that any benefit in security of supply to it would be extremely marginal. They further raised the issue of water quality. As water from either the Boyne or Fitzroy systems are more turbid, compared to water from Awoonga Dam, QAL would be required to modify its production processes to remove impurities in order to maintain its required minimum standards of quality of water. This would involve an additional cost to QAL.

CSC was concerned that the Fitzroy Pipeline will have a significant impact on prices, particularly if the pipeline is built for drought mitigation reasons before it is needed to meet long term demand growth.

QCA Analysis

Assessment Against the Threshold Criteria

GAWB's application of threshold criteria effectively requiring provision of water within 2 years after detailed planning had been finalised, and requiring diversification of supply, severely limits the available options for the purposes of a contingent supply as opposed to a long term supply augmentation. On GAWB's analysis, surface water options such as Castle Hope Dam, Baffle Creek weir and the raising of Awoonga Dam were rejected as they take between 7.5 and 12 years to deliver water.

There are other institutional constraints that eliminate or add to the risk of some of the options. For example:

- the recently completed Consultation Report (2007) regarding the Calliope River Water Resource Plan (WRP) (2006) states that the WRP does not make a water allocation for the proposed Castle Hope Dam. The WRP was done in parallel with the CQRWSS, which recognised that the Calliope River Basin was not a suitable future water-supply option for Gladstone's urban or industrial purposes; and

- the WRP for Baffle Creek is currently under preparation and due for release in late 2007. There is potential that, as Baffle Creek is a relatively pristine river system, the WRP will not make provision for a water allocation for the proposed Baffle Creek weir. In the interim, there is uncertainty surrounding the outcome of the WRP.

GAWB's concerns as stated in the SWP that further development of the Awoonga Dam on the Boyne River catchment would not provide the required diversification would also seem valid, at least for addressing current drought circumstances.

In practical terms, these circumstances effectively reduce the range of supply options available for current consideration as a contingent supply strategy to the Fitzroy Pipeline and desalination. The Authority considers that desalination may have greater advantages in terms of

diversification, as it does not rely on surface water hydrology at all, and may offer a higher degree of modular scalability than the Fitzroy Pipeline.

The Authority also considers that the other surface water options should be monitored in the long term. In particular, GAWB should consider its strategic options in securing an allocation under the Baffle Creek WRP.

There is also the need to continue the evaluation of air and sea water cooling. These are options which appear to be capable of early implementation and could provide sufficient breathing space and/or insurance should conditions deteriorate while other options are being refined.

In regard to the other matters raised by CPM in relation to the application of criteria to the respective options:

- the Authority notes that, in its supplementary submission, GAWB acknowledges that adjacent water catchments may be subject to similar hydrological risks as the Awoonga catchments. However, the Authority notes that the Fitzroy catchment benefits from frequent regular inflows to fill small storages on a continual basis, while the Awoonga Dam relies on less frequent major inflows. While the Authority accepts that there is some degree of diversification achievable by sourcing water from the Fitzroy, the risks of changes in hydrology (ie HNFY) would seem to be broadly similar in the adjacent catchments. While GAWB has highlighted the risk of minimal inflows to Awoonga Dam as a threshold criterion, this risk would also seem relevant for the Fitzroy. The Authority considers that GAWB should further investigate the hydrological risks of the Fitzroy, particularly in regard to the impacts of climate change;

- the Authority concurs that the scoring of desalination against the 'risk-to-cost' criterion in GAWB's updated assessment requires further explanation. For example, capital and operating costs associated with desalination should be available from the experience of plants in operation or under construction elsewhere in Australia. Different scoring against the risk-to-cost criterion is simply a reflection of the different level of effort currently applied in costing these options. It is also noted that some unresolved cost risks apply to the Fitzroy Pipeline, including the cost of the weirs and access to water from the Fitzroy River;

- the cost of bi-directional flows in the pipeline is not relevant for this analysis. Indeed, should bi-directional flow be introduced, it is highly likely that both the cost of that option and some portion of the cost of the pipeline itself should be allocated to the recipients of the bi-directional flow; and

- the rating of desalination as being less reliable than the Fitzroy Pipeline is debateable. Both options entail management and engineering risk, but the Fitzroy Pipeline also incurs hydrology risks.

Water Sources

The Authority notes that a volume of 30,000ML per year of reliable water from the Lower Fitzroy is expressly provided for urban and industrial requirements for GAWB under the amended Fitzroy Resources Operations Plan and that the Fitzroy Pipeline has been announced as a key element of the Government's CQWRSS and the *Statewide Water Plan*. However, this commitment is subject to further investigation. GAWB should ensure that the 30,000ML allocation from the proposed new weirs is firmly secured and based on appropriate hydrological information.

Further, although the available information is that construction of the Eden Bann and/or Rookwood weirs remains on track for 2011, there remains a risk that these weirs could be delayed. Additionally, there is a period of filling time required of 0.8 years (noted in GAWB's SWP), and the weirs themselves may be subject to worst-case inflows under regional drought and climate change scenarios. Therefore, GAWB should ensure that it can access alternative supplies on an interim basis should they be required.

Costs of the Alternative Options

The Authority considers that stakeholder comments regarding the escalating costs of the Fitzroy Pipeline are relevant. The Authority notes that GAWB prepared more detailed updates of the cost estimates for the Fitzroy Pipeline compared to the other options including desalination and air-cooling of power stations. The significance of the changes in costs and project specification warrant a more comprehensive re-visiting of the economic analysis than that provided by GAWB.

A more detailed economic analysis of the various options using updated capital cost information of similar quality to that developed for the Fitzroy Pipeline option should enable a more balanced comparison, taking into account differences in relevant risks.

A detailed analysis of the costs and benefits of air and sea water cooling also seems warranted as the resulting delay in dam failure may be sufficient to provide a better assessment of appropriate supply options – or even allow for more time for alleviating rains.

Further, the Authority considers that GAWB should also provide more detailed information to its customers in regard to the eventual pricing impacts of the alternative options, and seek clarification from its customers as to whether there would be any significant short-term or long-term demand responses. The pricing impacts on a per ML basis will vary depending on the demand projections used.

This information will be important to GAWB in determining whether customer demand responses, combined with other smaller scale contingency options, defers the need for a large scale contingent source response. Similarly, with respect to drought, customers may indicate a preference to manage their own drought risk through restrictions, demand management and alternative supplementary supplies.

Conclusions

The Authority has concerns that the preferred option may be biased by the relative level of effort directed to the Fitzroy option as opposed to other options – particularly desalination.

The Authority considers that, under the worst case scenario postulated by GAWB (the average of the 3 consecutive worst inflows), there is sufficient time to undertake further investigations of potentially available options.

However, as noted by GAWB, there is a possibility of an unpredicted event, such as one or more years of even lower inflows or, for example, a failure in inflows in the coming wet season. The range of options which could be implemented to avoid failure in supply in such circumstances is currently limited to the Fitzroy Pipeline. In this regard, if rains fail this summer, the period of time available to respond thereafter reduces significantly as options such as harsher DMP restrictions and air-cooling may not buy sufficient time to allow a supply augmentation to be implemented. Under this scenario, desalination as a first response is also problematic given the planning lead times, environmental issues and construction period (3 years) required.

As a result, the Authority considers that it is prudent to continue working towards implementing the Fitzroy Pipeline option, to manage the risk of zero or minimal inflows over the coming wet season. In addition, effort should also be directed towards other options such as desalination, air and sea water cooling and alternative supply restrictions in the event that inflows are sufficient to provide the necessary window for more comprehensive analysis of these options. At the same time, the demand/supply situation should be kept under active review and the level of preparatory expenditure on the Fitzroy Pipeline should be reconsidered if circumstances allow for more time.

As part of its consideration of the Fitzroy Pipeline option, GAWB should ensure that:

- there is a firm commitment for supplies to be available from Eden Bann and/or Rookwood Weirs; and

- arrangements are in place to access alternative supplies of water from the Fitzroy River by mid-2012 should they be required on an interim basis.

The Authority also notes that, once the pricing implications of the Fitzroy Pipeline are known, customers may find by-pass opportunities or demand management strategies which reduce their water requirements of GAWB. The potential cost of the contingent supply strategy may lead some customers to investigate such options and therefore price estimates should be made public. This will require a more thorough analysis of long term demand projections than has currently been undertaken by GAWB.

4. PREPARATORY EXPENDITURE

GAWB sought the Authority's endorsement of certain specific types of preparatory expenditure as being prudent to be incorporated into GAWB's asset base from July 2010. The preparatory expenditures included project management, approvals, land acquisition, consultation and communication, engineering and investigations and asset creation. GAWB provided an indicative total cost estimate of $23.8 million for these costs, and an additional $1 million for investigations for the feasibility and siting of a desalination plant.

GAWB has not requested approval for specific expenditures but rather for the Authority to approve the categories of expenditures.

The Authority considers that:

- *preparatory expenditures on items such as project management, approvals, consultation and communication, engineering and investigations and land acquisition are appropriate if there is a high probability of project commencement in the next few years. Given the need to continue working towards implementing the Fitzroy Pipeline option, to manage the risk of minimal inflows over the coming wet season, it is considered prudent to incur such expenditures on this option;*

- *expenditures on the feasibility of air and sea water cooling and desalination are also appropriate;*

- *asset creation expenditure should be deferred until the preferred contingent supply strategy is finally settled. Any items purchased in advance of construction would need to be at GAWB's own risk;*

- *the demand/supply situation should be kept under active review and the level of preparatory expenditure on the Fitzroy Pipeline should be reconsidered if circumstances allow for more time to review other options; and*

- *specific expenditures should be subject to an ex-post review before being considered for incorporation in prices (as proposed by GAWB).*

The Authority also considers that:

- *the timing of preparatory expenditures should take into account the period of time required for completion of preparatory expenditure and the likely elapsed time before construction is triggered; and*

- *GAWB should inform and seek input from customers in regard to its proposed schedule for works.*

4.1 Background

The Ministerial Direction requires the Authority to consider:

- the level of efficient costs associated with the development of GAWB's contingent supply strategy that should be included in prices; and

- the timing of expenditures which are related to the implementation of the contingent supply strategy.

In Chapter 3, the Authority indicated that it was prudent to continue working towards implementing the Fitzroy Pipeline option to manage the risk of zero or minimal inflows over the coming wet season. However, under more likely rainfall scenarios, sufficient time should be available to investigate more comprehensively other options.

GAWB's submission outlines forecast preparatory expenditure of $23.8 million in respect of the Fitzroy Pipeline and $1 million in respect to a desalination plant.

GAWB sought confirmation that certain types of expenditure were appropriate to incur as part of its contingent supply strategy. GAWB has not sought approval at this time of the actual level of expenditure of the type outlined that it will undertake and has instead suggested that an ex post review before the 2010 price reset to confirm that expenditure levels were appropriate. In the absence of detailed submissions from GAWB relating to the merits of the proposed costs, the Authority has sought to respond to the Ministerial Direction in the manner requested by GAWB.

4.2 Efficient Preparatory Expenditure

Types of Expenditure

GAWB's Submission

GAWB's submission outlined the types of expenditure that form the forecast preparatory expenditure for the Fitzroy Pipeline, as follows:

- project management, including coordination, reporting and information and workflow management. GAWB indicated that this element does not include any overhead costs already incorporated in customer prices ($3.5 million);
- approvals, mainly relating to environmental impact studies (EIS) and contributory studies ($1.9 million);
- land acquisition including, in part, actual land or easement purchases or payment of licence fees to the State for easements ($5.1 million);
- consultation and communication, associated with the EIS and other approvals ($1.5 million);
- engineering and investigations, including design. GAWB indicated that this cost is based on a percentage of capital cost typically incurred in infrastructure design ($6.9 million); and
- asset creation, specifically acquisition of certain assets types with long procurement times such as electricity facilities, pipes and pump motors $5 million).

GAWB also proposed to spend about $1 million to assess the feasibility of a desalination plant, the major costs relating to a plant siting study.

GAWB submitted that making these types of preparatory expenditures could avoid costs associated with fast-tracking project delivery. These could include savings in freight costs for delivery of long lead-time items, benefits from more thorough geotechnical investigations, reduced potential for contract variations, and reduced risks from hastened procurement processes. GAWB submitted that prudent preparatory works could, all other things being equal, lead to lower construction and materials costs than would occur under a fast-tracked project.

Other Jurisdictions

IPART's determination for metropolitan water businesses (2005b) identified preliminary work for contingent supply strategy options to be considered within the capital expenditure allowance. For example, IPART has allowed $94 million capital expenditure on preliminary work over the regulatory period. Types of expenditure within the preliminary work included site acquisition, project development, detailed design and testing and project management.

ESC (2005) assessed proposed capital expenditure forecasts set out in the capital program of each water businesses' Water Plan. In this process, the ESC's price review (2005) did not accept Melbourne Water's proposed expenditure on a desalination plant at the Western Treatment Plant to improve the quality of treated wastewater. The ESC excluded this on the basis of independent advice that significant analysis and investigations were required, and that revenue and price impacts were immaterial within the regulatory period. The ESC noted that any capital expenditure undertaken during the regulatory period will be rolled into the regulatory asset base at the end of the period subject to it being prudent and efficient.

Ofwat's price review (2004a; 2004b; 2006) approved expenditure on investigative and developmental work for new reservoirs and a desalination plant.

Stakeholder Submissions

There was some support in principle for GAWB to incur certain types of expenditure, and in particular:

- RTA recognised the prudence of continuing engineering investigations and acquisition of land and approvals for the project so that schedule risk for delivery of the project can be mitigated; and

- CPM submitted that it supported well-founded spending on project planning and other preparatory works, where this spending offers a clear benefit to users.

At the same time, stakeholders expressed concerns about the types of expenditure. For example:

- RTA stated that, based on its own project management and financial control systems, it does not understand why it should be necessary to purchase long lead time equipment ahead of a decision to trigger the augmentation;

- CPM expressed concern that GAWB may end up paying for a significant share of the State's costs in acquiring and developing the proposed Stanwell-Gladstone Transport Infrastructure Corridor, in which the proposed Fitzroy Pipeline will be located. CPM considered that, because of the evident 'spare capacity' in the corridor, there was very little risk of access to the corridor being lost in the medium term; and

- CS Energy submitted that, as the urgency for supply augmentation does not exist, it is unclear why GAWB needs to commit significant engineering design, project management and land acquisition costs in 2007-08. In CS Energy's view, some modest pre-feasibility design and route selection work may be justified.

QCA Analysis

In view of the identified uncertainties, the Authority proposes to accept GAWB's submission that the levels of expenditures be subject to an ex-post review before being incorporated in

prices from 2010. This would allow the Authority to take specific market circumstances for individual components, such as land valuations, into account.

The Authority proposes that the types of expenditures which will be accepted in any subsequent review are those that are:

- necessary to be incurred to allow the relevant contingent supply strategy to be implemented cost-effectively within the required time; and
- not already covered as part of GAWB's current overhead and operational costs.

The Authority notes that GAWB's customers have variously raised concerns about whether certain cost items are legitimate preparatory expenditures, including the purchase of engineering equipment, the cost of the land corridor and costs of project management.

GAWB's submission only provided broad descriptions of the types of expenditures proposed to be incurred. For example, the $2.9 million expended prior to June 2007 includes GAWB's costs for the preparation of the submission to the Authority, GAWB's business case for the pipeline and costs associated with the declaration of the Stanwell-Gladstone Transport Infrastructure Corridor (SGTIC).

The Authority engaged Cardno to assess the appropriateness of GAWB's proposed preparatory cost categories. Their conclusions were that it would be reasonable and appropriate for preparatory works to be completed for a project with a high probability of commencement in the next few years (emphasis added), the key components being:

- sources and timing of project funding;
- selection of routes and sites;
- investigations and surveys for approvals and design, including environmental, indigenous heritage, topographical and geotechnical surveys;
- consultation with stakeholders;
- acquisitions of land and easements. Cardno considered that land acquisition should be completed as land is unlikely to lose its value or become a stranded investment;
- other utilities contacted about supplying infrastructure, eg power telecommunications roads;
- completion of detailed design;
- preparation of procurement documentation for long lead time items, and possible expressions of interest; and
- construction contract documentation.

Based on the Draft Construction Programme and informal discussions with key suppliers Cardno did not consider that asset creation expenditure on long lead time equipment and materials would be required.

In relation to desalination, Cardno considered that GAWB should select, acquire and re-zone a suitable site close to the coast as soon as possible.

On the basis of the advice from Cardno, and the above criteria, additional operational expenditures such as project management, approvals, consultation and communication, engineering and investigations and land acquisition incurred either before or after June 2007 are considered appropriate where they relate to the relevant contingent supply strategy.

In addition, Cardno also consider that other types of expenditure may subsequently prove to be justified and suggests that the Authority should be open to approving these if GAWB provides sufficient justification ex post. These include any asset creation costs required to be expended to deliver the construction program.

The Authority notes that GAWB perceives financial benefits from procuring certain items to avoid fast-tracking of the subsequent construction process. The Authority supports such an approach provided that the purchase meets the above criteria.

In regard to CPM's comments about access to the Stanwell-Gladstone Infrastructure Corridor, and whether there is a need to secure a share of the corridor in the preparatory stages, it is for GAWB to satisfy the Authority that its approach is consistent with the proposed criteria prior to the 2010 reset.

In summary, therefore, apart from asset creation expenditure, the nominated generic types of expenditure are considered appropriate once there is a high degree of probability that a particular contingent supply strategy will proceed. Expenditure on highly specific assets which it is not possible to resell at or near purchase price would remain at GAWB's risk until a decision is made on the preferred contingent supply strategy.

In addition, the Authority considers that the demand/supply situation should be kept under active review and the level of preparatory expenditure on the Fitzroy Pipeline should be reconsidered if circumstances allow for more time to review other options.

As suggested by GAWB, the admissibility of specific expenditures will be considered as part of the 2010 price reset, using the Authority's usual eligibility criteria.

Level of Efficient Preparatory Costs

GAWB's Submission

GAWB's submission provided forecast preparatory expenditure for each type of expenditure over 2 years, 2006-07 and 2007-08, as detailed in Table 4.1.

Table 4.1: GAWB's Forecast Expenditure by Type for the Lower Fitzroy Option

Forecast Capital Expenditure ($m)	*2006/07*	*2007/08*	*Total*	*Percentage of Total (%)*
Project Management	0.9	2.6	3.5	14.7
Approvals	0.9	1.0	1.9	8.0
Land Acquisition	0.0	5.1	5.1	21.4
Consultation / Communication	0.3	1.3	1.5	6.3
Engineering and Investigation	0.9	6.0	6.9	29.0
Asset Creation	0.0	5.0	5.0	21.0
Total	**2.9**	**20.9**	**23.8**	**100.0**

Source: GAWB Submission
Note: Totals may not add due to rounding.

GAWB also proposed to spend a further $1 million on a feasibility study for desalination, bringing the total expenditure to $24.8 million. As noted above, GAWB did not seek current approval of the proposed level of expenditure, and suggested that an ex post review before the 2010 price reset could be used to confirm that:

- the standard of the works is appropriate in that the proposed works do not involve any unnecessary works and are not over-designed; and
- the cost of the works is reasonable [within that context, efficient].

GAWB submitted that it, not customers, should bear the risk of inefficient expenditure, noting that 'GAWB should not be able to automatically pass on to customers the cost of land purchases where the price paid is significantly higher than valuation.' GAWB submitted that necessary land purchases *per se* should be accepted as prudent with roll-in optimisation limited to the efficiency of the amount paid.

GAWB referred to the Authority's previous access undertakings for Dalrymple Bay Coal Terminal (DBCT) and QR with provisions of ex ante principles and guidance in regards to regulatory approval of capital expenditure. GAWB noted that the Authority has recently agreed to guarantee roll-in of certain DBCT and QR investments provided certain criteria are met.

Other Jurisdictions

IPART (2005b) recognised desalination as a Government initiative, but noted there was uncertainty regarding the magnitude of costs and timing of a desalination plant. Consequently, Sydney Water is required to report on these items separately and IPART will conduct an ex post review of expenditures at the next determination.

ESC (2005), in considering whether a desalination plant was necessary, determined that cost recovery for expenditure on a desalination plant would be subject to tests of prudence and efficiency at the next price review.

Stakeholder Submissions

CS Energy considered that the proposed preparatory work program is excessive and unnecessarily pre-emptive as it considers that the urgency for supply augmentation does not exist. CS Energy submitted that it was unclear at this point in time that a commitment to the pipeline will be justified in the foreseeable future.

GEIDB commended GAWB efforts to progress a contingent supply strategy. GEIDB submitted that, because of the nationwide mining boom, Queensland infrastructure programmes have caused a substantial tightening in supply chains which has led to cost escalation and elevated the timing risk. GEIDB considered that this pressure on supply chains may intensify in coming years as new projects compete for skills and equipment.

QCA Analysis

The Authority notes that, although GAWB has not requested ex ante endorsement of the level of preparatory costs, the Ministers' Direction requires the Authority to have regard to the level of efficient preparatory costs associated with the development of the contingent supply strategy.

The Authority notes that GAWB's cost estimates are based on a percentage of construction cost that reflects broad industry experience, rather than an itemised and specifically costed work program.

There is insufficient information to confirm or reject proposed costs with certainty and indeed the Authority is aware that estimates can be subject to wide variation under current industry conditions. Nevertheless, the Authority sought advice from Cardno on the appropriateness of GAWB's costing approach and an estimate of an indicative range of preparatory costs.

Cardno indicated that, excluding expenditure on tangible assets such as land and equipment, GAWB's forecast expenditure on approvals, consultation, engineering, investigations and project management was $13.8 million. Cardno suggested that a likely range for such a project should be 3 to 4% of total project cost, or $10 to $14 million, taking into account that the project includes a complex water treatment plant. Cardno considered that more detail was required to determine whether $3.5 million for project management was reasonable in the preparatory stages.

While GAWB's forecast expenditure of $13.8 million on these items was at the upper end of the range suggested by Cardno, it does not seem unduly excessive.

In combination with the criteria previously stated for defining eligibility as preparatory costs (ie the scope of the works), the Authority proposes to accept GAWB's proposal that ex post approval of the level of costs be subject to tests that the:

- standard of the works is appropriate, in that the proposed works do not involve any unnecessary works and are not over-designed; and

- cost of the works is reasonable, that is, it is economically efficient.

The issue of subsequent optimisation of preparatory expenditures is considered in Chapter 5.

4.3 Timing of Preparatory Expenditure

GAWB's Submission

GAWB proposed to incur preparatory costs from 2007 to enable it to trigger supply augmentation, if needed, no later than April 2008. In this regard, GAWB has already incurred $2.9 million (2006-07 dollars) on initial project management, approvals, consultation and engineering investigations. The remaining preparatory expenditure of $20.9 million, on the various items identified above, and a further $1 million on a desalination feasibility study, is proposed to be spent in 2007-08.

GAWB's submission indicated that targeted preparatory expenditure should reduce the risk of project delay by generating better information to identify critical path items to enable them to be addressed in advance. In the preparatory costs stage, the critical path is defined by the approval of the EIS, which may trigger the *Commonwealth Environmental Protection and Biodiversity Conservation Act*. The approvals could not be completed before mid-2008, and are a pre-requisite for construction.

GAWB submitted that the fastest reasonable implementation of the Fitzroy Pipeline is by mid to late 2010. Construction of the water treatment plant will provide the critical path, and is unlikely to be constructed in significantly less than 2 years.

The timing for delivering the desalination option was considered by GAWB to be slightly longer, with commissioning possible in early 2011.

The critical factor in the timing of the contingent strategy infrastructure development, and therefore the preparatory costs, was GAWB's concern that Awoonga Dam supplies could fail by early 2011.

Stakeholder Submissions

GEIDB considered GAWB's approach to be a prudent recognition of contemporary major industrial lead times and the need for concomitant infrastructure to be under study on a concurrent basis rather than a sequential basis.

RTA submitted that a detailed execution strategy for the Fitzroy Pipeline project, including key risks and uncertainties, should be developed. This should be shared with customers to provide further clarity regarding the issue of timing and expenditure. Consequently, future implementation expenditure could be well understood and broadly supported when required.

CPM and CSE linked the need for preparatory expenditure to the timing of supply augmentation. In particular:

- CPM questioned the need to spend significant sums now, in 2007 or 2008, for a project that quite probably will not be needed for another decade and a half, if at all; and

- CSE supported previously developing augmentation options for a speedier completion path, including undertaking long lead time but low cost planning items. The benefit of which was to delaying commitments to augmentations which may not be required for many years in the future or not at all.

Consequently, CPM and CSE questioned the need for all preparatory items to be spent now:

- CPM called on the Authority to critically review the expenditures and activities proposed by GAWB to determine which are absolutely essential now, and which might be deferred; and

- CSE considered the preparatory expenditure excessive and unnecessarily pre-emptive. CSE submitted that as the urgency for supply augmentation does not exist, it is unclear why GAWB needs to commit to significant engineering design, project management and land acquisition costs in 2007-08. CS Energy considered that, while modest pre-feasibility design and route feasibility work is justified, expending a further $20.9 million at this stage has not been justified.

QCA Analysis

The Authority considers that the appropriate timing of preparatory expenditures essentially depends on the time required to complete the preparatory tasks and the shelf-life or currency of the preparatory works.

As a general principle, preparatory expenditures should be completed in sufficient time to eliminate the risk of not being able to commence the contingent supply response when required. Some preparatory cost items may be deferrable, while other items will define the critical time path.

While the Authority considers that it is premature to conclude that the Fitzroy Pipeline should be the preferred contingent supply option, the Authority is also aware that should current drought conditions continue, there may be little or no time between the completion of the preparatory expenditure phase and the triggering of construction.

The Authority engaged Cardno to assess the proposed preparatory expenditures in regard to timing. Their conclusions were that:

- preparatory works can take up to 3 years to complete, but can be expedited for critical or emergency projects, such as drought relief projects declared by the government. Cardno considered that 2 years may be required for preliminary design, approvals, consultation, investigations and procurement assessment; and

- a 'natural hold-point' (where previous assessments and plans remain current) exists after these preparatory works are completed, and most well-managed water construction projects can be completed within about 2 years of achieving this hold-point, even when the construction market is tight.

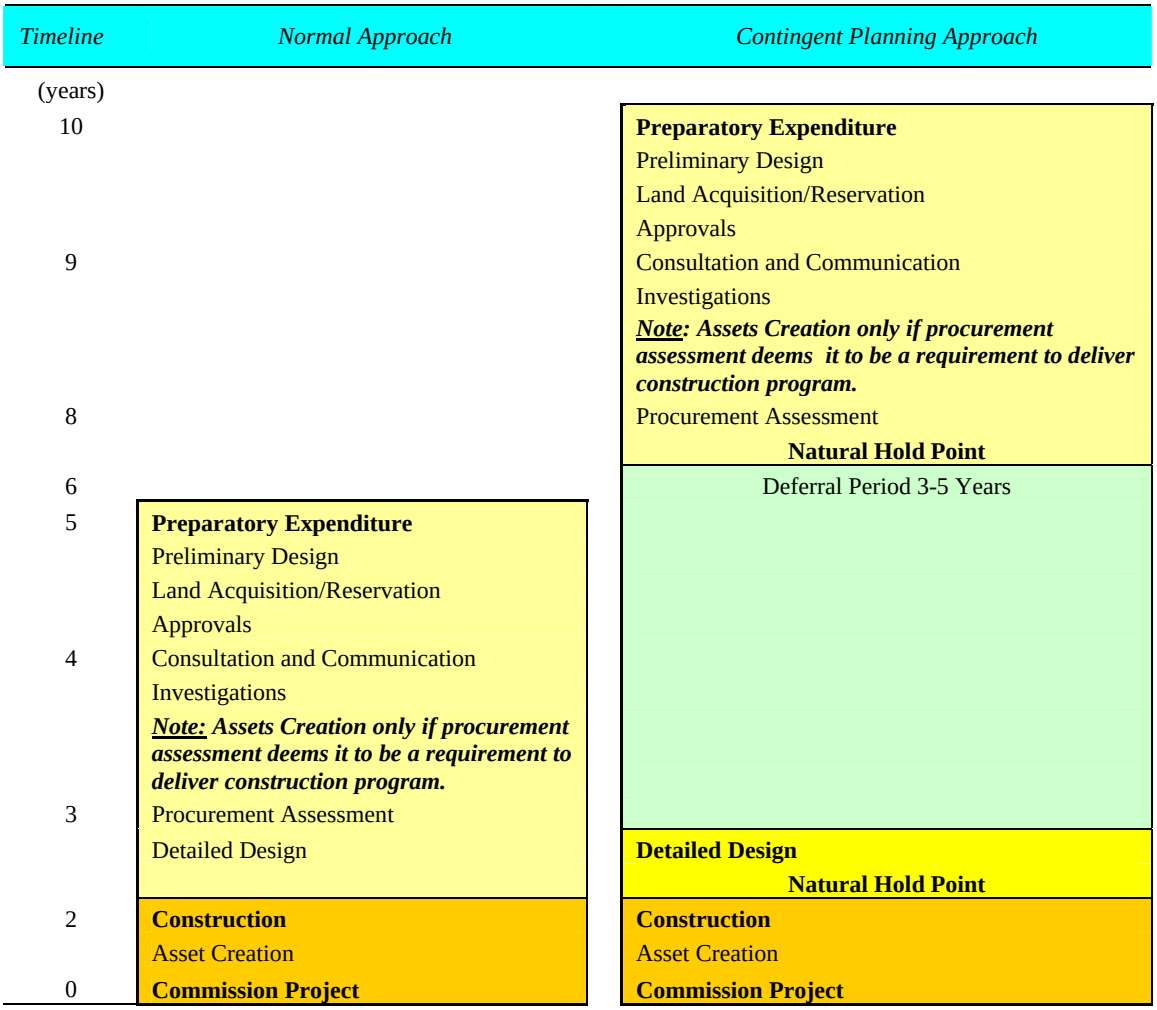
This scenario is generally consistent with GAWB's proposals, in that GAWB has a 2-year timeframe for preparatory works.

Cardno suggested that, in the absence of urgent circumstances, if the trigger for construction is 3 to 5 years beyond the natural hold point, then a lesser state of preparedness may be appropriate, although this would be considered on a case-by-case basis. More detailed design work could be deferred until about a year before the trigger for construction. Hence, Cardno suggests that, where there is a longer time frame, there may be a sequence of triggers to progressively undertake the required works.

Cardno provided a recommended sequence of the key expenditure components and the appropriate timing, as shown in Figure 4.1 for preparatory expenditures incurred up to 10 years before commissioning, compared to a normal development programme over 5 years. In the

absence of urgent circumstances, Cardno suggested that a trigger could be set for detailed design to be done 3 years before, with a further trigger for construction 2 years before.

Figure 4.1. Timing of Preparatory Expenditure



The Authority also considers that some elements of the preparatory works may devalue or become redundant. There is therefore a risk that such costs will need to be re-incurred if the actual construction is deferred into the future. Hence, there is an optimal time to incur preparatory expenditure – if too early, some costs may depreciate; if too late, there may not be sufficient time to build the infrastructure. Cardno identified the following potential issues for relevant preparatory expenditures:

- the currency of intangible assets such as approvals, agreements, design drawings, specifications, contract documents, procurement lists, management plans and quotations developed as part of preparatory works is probably less than 10 years. The value of these may gradually decline over a period or may incur step-change in line with expiry dates. Decisions would be required on when to re-work these intangible assets so that they remain current; and

- if a major inflow into Awoonga Dam occurs, GAWB may defer the project. However, only if deferral is for longer than 5 to 7 years would it be worth halting environmental and other surveys, investigations and approvals once they have been initiated.

The Authority notes general concern among customers including CS Energy and CPM that costs should be deferred as much as possible. In this respect, the approach recommended by Cardno allows for two trigger points rather than one as suggested by GAWB, although in urgent circumstances, the timeline may be compressed.

In the context of the Authority's concerns about the need to consider available options more fully before determining the preferred contingent supply option, expenditure beyond the first natural hold point should not be incurred until that decision is taken.

It should be noted that GAWB has since indicated in its supplementary submission to the Authority that it will include a detailed execution schedule within its scope of work, as per RTA's suggestion. The Authority considers that customers should be given an opportunity to respond to the proposed execution schedule.

5. IMPACTS ON PRICING IN SUBSEQUENT YEARS

GAWB's submission proposed that efficient preparatory costs for the contingent supply strategy be considered as work in progress and capitalised using the appropriate WACC and included in pricing from 1 July 2010. GAWB also proposed that the preparatory expenditure not be optimised out of the asset base without compensation to GAWB.

In GAWB's view, the benefits of the preparatory expenditure extend to all customers and should be incorporated in the volumetric component of the water reservation and storage charge for all customers.

The Authority considers that prudent preparatory costs be treated as work in progress and capitalised forward for inclusion in the asset base upon commissioning of the infrastructure. The appropriate WACC rate for capitalising the preparatory costs should be that applicable in each regulatory period.

The Authority accepts that, in accord with its current general practice, prudent preparatory costs will not be optimised out of the asset base without compensation other than under certain limited circumstances.

The Authority considers it inappropriate to consider the basis for recovering preparatory costs independent of a consideration of GAWB's submission in regard to the recovery of the costs of the new infrastructure to which the preparatory costs relate.

Although the Authority does not propose to consider the treatment of preparatory costs for pricing purposes separately from the treatment of the remainder of the costs of the related assets, it reviewed GAWB's estimates for the purpose of providing greater information to customers. This review indicated that the preparatory costs proposed by GAWB would add $24 to $27/ML to prices and those recommended by Cardno would add $18-20/ML.

Of more relevance to customers is the impact on prices of the construction of the contingent supply. On the basis of the limited available information, the Authority estimates that prices would need to increase by around $410/ML on average under a low demand scenario, and by around $310/ML under a high demand scenario.

5.1 Background

The Ministerial Direction requires the Authority to determine the means by which efficient costs of the contingent supply strategy, that is, the costs of undertaking preparatory works, should be included in prices for subsequent years.

GAWB's proposal addressed the following key issues:

- the treatment of preparatory expenditure – as work in progress to be rolled forward into prices from July 2010;
- subsequent optimisation of the preparatory expenditures;
- the allocation of preparatory costs between customers and customer groups for pricing purposes; and
- the pricing implications of preparatory expenditures.

5.2 Treatment of Preparatory Expenditure

GAWB's Submission

GAWB proposed that the contingent supply strategy expenditure be treated as work in progress, and that the balance be rolled forward each year using the WACC used for striking prices for the current period. GAWB proposed that, from 1 July 2010, the preparatory expenditure should be rolled into the regulatory asset base and depreciated over its expected economic life. GAWB further noted that the expenditure should not be depreciated until it is included in the asset base.

GAWB considered this approach is consistent with what would have resulted if this expenditure had been forecast as part of the 2005 pricing practices investigation.

Other Jurisdictions

In general, the typical approach is to incorporate efficient forecast expenditure and prudent past expenditure into the regulated asset base and roll it forward to establish its value at the start of each year in the determination period (IPART 2005a, 2005b, 2006, ERA 2005a, 2005b, ESC 2005).

Stakeholder Submissions

None of the stakeholder submissions specifically focused on the treatment of preparatory expenditure for pricing purposes, other than to comment on the magnitude and timing of the expenditures.

QCA Analysis

Treatment of Preparatory Costs

The Authority's position arising from its 2005 investigation of GAWB's pricing practices was that work in progress should be capitalised at the relevant WACC and be recognised in the asset base for pricing purposes once it was fully completed and able to contribute productive capacity to the system. Similar approaches were used by the Authority in other investigations, including for the DBCT undertaking (QCA, 2006b) and for the QR undertaking (QCA, 2006c).

Therefore, the Authority proposes that GAWB's preparatory costs should be treated as work in progress and capitalised until the asset is commissioned, or a decision is made not to proceed with the investment.

However, as previously noted, the asset valuations rolled into the asset base would be subject to the usual tests that the scope, standard and cost of the works is reasonable. This is consistent with GAWB's proposals.

WACC

The WACC rate proposed by GAWB to capitalise the preparatory expenditures is the WACC set at July 2005 by GAWB consistent with the Authority's recommended pricing practices for the current regulatory period.

This is consistent with the outcome that would have occurred had the preparatory costs been considered at the time of the 2005 review. Accordingly, the Authority considers that GAWB's proposal is reasonable.

A revised WACC will of course apply for the next review period.

Return of Capital

The Authority agrees with GAWB's proposal that the work in progress not be depreciated until it is rolled into the asset base for pricing purposes. However, unlike GAWB, the Authority proposes that WIP not be rolled in to the asset base until the works are commissioned.

Once the relevant assets are commissioned, the related preparatory costs included in WIP should be included as part of the capital costs of the infrastructure and be subject to normal return on and return of capital.

5.3 Optimisation

GAWB's Submission

GAWB indicated that it expects that the preparatory costs would be subject to a test that the standard of works is appropriate, that there are no unnecessary works, and that they are not over-designed.

GAWB proposed that the Authority confirm that, if the preparatory expenditure for the proposed Fitzroy Pipeline subsequently becomes redundant (for example, if desalination becomes the preferred supply), then GAWB would be compensated for the optimisation of the work in progress. GAWB noted the normal regulatory caveat that the regulator has not been misled. GAWB proposed that any write-off is treated as a depreciation expense (over an unspecified period) recoverable through tariffs.

GAWB considered that it would not promote investment or provide regulatory certainty if the Authority were to conclude that preparatory expenditure was prudent in 2007, but then optimise out investment during a subsequent review without compensation to the service provider.

GAWB considered that its proposed approach is consistent with brownfields optimisations as previously endorsed by the Authority.

Stakeholder Submissions

GPN supported GAWB in its proposal that, if the Fitzroy Pipeline option becomes redundant, that GAWB will be compensated for the costs incurred as appropriate.

QCA Analysis

As previously noted, the Authority accepts GAWB's proposal that the Authority would subject GAWB's actual preparatory expenditure to tests that the standard of works is appropriate, that there are no unnecessary works, and that they are not over-designed and based on a least-cost procurement basis. In addition, the scope of the works will need to be consistent with the Authority's comments in Chapter 4 regarding the scope of preparatory works prior to a decision being made on a preferred contingent supply strategy.

In relation to subsequent optimisation, the Authority's general approach, as stated in the Final Report of the GAWB investigation (2005) and in other draft access undertakings, (eg. QCA 2005b; QR 2006c), is not to optimise investments that were considered prudent at the time of the investment without some form of compensation to the service provider.

However, the Authority also proposed that optimisation without compensation may be appropriate under certain circumstances. Such circumstances include:

- where the regulator had previously been misled in some way;
- if there are actual bypass options;
- where there are issues in relation to customers' capacity to pay; or
- where there is a need to promote outcomes in downstream or upstream markets that are consistent with those of properly functioning competitive markets.

In keeping with its previously defined approach, the Authority proposes that the preparatory costs assessed as being efficient, prudent and appropriate at that time would not be subject to future optimisation without compensation to GAWB, subject to the above provisos.

Furthermore, should some, or all, of the preparatory expenditure become outdated or redundant, or if the contingent supply strategy is not triggered, any prudent expenditure that is "lost" would be able to be recovered in full by GAWB. However, the nature of these arrangements is a matter appropriately considered at the time they would apply.

5.4 Cost Allocation

The Ministers' Direction requires the Authority to investigate GAWB's recovery of proposed preparatory expenditure from existing and future customers.

GAWB's Submission

GAWB proposed that, in the case of drought, all customers benefit from the timely supply from an alternative source that reduces the risk of supply failure. GAWB also submitted that similarly, all customers benefit from the preparatory expenditure which enables a shorter lead time.

GAWB recognised the cost of common infrastructure in the case of demand-led augmentation. GAWB cites the Authority's recommendations from the 2005 pricing practices investigation, which established that, in principle, the cost of common infrastructure should be allocated to all existing and expected new customers, provided the cost represents the least cost option to meet projected demand.

In its SWP, GAWB indicated that it would investigate methods by which products with different levels of reliability could be offered, following direct negotiations with customers. However, GAWB also indicated that a number of different products offering different levels of reliability would add to the complexity of GAWB's pricing methodology and its DMP.

GAWB indicated in its submission that pricing arrangements for the multi-source system that would exist after construction of the next source would be discussed in a future submission.

Stakeholder Submissions

GPN supported GAWB in its proposal for preparatory costs to be recoverable from all of its customers through prices charged for water from 1 July 2010.

However, submissions from existing customers, expressed concerns about the proposed attribution of benefits between existing and new users:

- CSC submitted that, if the Fitzroy Pipeline is built for drought mitigation reasons, then those industries which are reliant on this safety net should be the customers who pay for the costs of bringing forward the construction of the Pipeline until such time as the water from the Fitzroy River is permanently required to meet increased demand above the yield available from Lake Awoonga;

- CSC further considered that as future increases in demand will predominantly come from new industry located in the northern limits of GAWB's delivery network, within the State Development Area, these industries should be supplied with Fitzroy River water and accordingly pay the full cost of this water; and

- QAL argued that existing users that derive no direct benefit should not have to contribute to the capital cost of the Fitzroy Pipeline through increased water charges as proposed. QAL could see some argument for existing users to contribute to ongoing maintenance and operating costs of the pipeline, where reinforcement of supply security can be demonstrated.

In regard to system reliability:

- CPM proposed that customers are best placed to judge their tolerance of supply risks. CPM suggested that GAWB should match customer security preferences with supply reliability. Customers could opt-in to meet the costs of premium level water supply security, while those opting out would rely on the existing lower level of supply reliability. CPM noted that there is a point where the value of reliability to the user is not sufficient to cover its cost;

- CPM submitted that the proposed preparatory works do not deliver any additional water into the catchment in the near term, and hence have no impact whatsoever on supply reliability; and

- according to QAL, the additional supply will not directly reinforce the security of QAL's supply and indirect reinforcement would be extremely marginal.

Although GAWB's submission indicated that the issue of multi-source cost allocation would be reviewed in the next stages of the investigation, some customers raised concerns, including:

- QAL submitted that the connection of the Fitzroy and Boyne catchments creates a single system;

- RTA considered that any additional costs that GAWB customers are asked to bear should reflect the fact that water may be directed away from Gladstone at some point in the future;

- CPM submitted that it had no direct access to Fitzroy Pipeline water and that should Awoonga run dry, CPM would not be able to access water. CPM's position was therefore that it benefited less than customers with direct access to the Fitzroy Pipeline. CPM noted that the distribution of benefits across customers is not equal, and nor is the value of increased supply reliability uniform across the customer base; and

- CSC expressed a view that, if the Fitzroy Pipeline is built and a postage stamp price introduced in place of the Authority's previously recommended nodal pricing, CSC will have been potentially overcharged in the past and should be entitled to a refund.

Some stakeholders considered that costs should be met by government and, in particular:

- RTA believed that the proposed Fitzroy Pipeline should attract State Government support on the basis that it is key common infrastructure for the Gladstone area; and

- QAL expressed the view that, until the new customer demand is fully realised, the Queensland Government as the promoter of the Gladstone State Development Area should underwrite the cost of providing a secure water supply and supporting infrastructure in advance of demand.

QCA Analysis

While the Authority notes the views of GAWB and the various stakeholders on this matter, the Authority considers it inappropriate to consider the issue of the appropriate recovery of preparatory costs independent of the consideration of GAWB's submission in regard to the recovery of the costs of the new asset.

Preparatory costs form part of the final asset and, for this reason, the Authority has indicated that such costs should be capitalised as WIP until the asset is commissioned. Furthermore, they should be treated in the same manner as the assets to which they relate.

The Authority notes the concerns of stakeholders, such as CSC, CPM and QAL, that they might not directly benefit from a drought mitigation response or from supply augmentation. The option of 'opt-in and opt-out' provisions for a contingent supply strategy as suggested by CPM is a form of reliability product pricing and should be considered in the context of overall pricing considerations.

The issue of Government support for a drought response, augmentation of supply and provision of common infrastructure to encourage state economic development is a matter for Government. The Government support may be in the form of an annual subsidy or as capital with a prescribed rate of return. However, the Authority notes that, under the Community Service Obligation (CSO) policy framework, to qualify as a CSO, an activity must involve a non-commercial product or service and be purchased by government on behalf of the community.

5.5 Pricing Impacts

GAWB's Submission

GAWB proposed to recover project costs through water reservation and storage charges with additional costs included in the volumetric component of the tariff.

Since GAWB considered that all customers benefit from the Fitzroy Pipeline option, GAWB chose to implement the costs on the reservation and storage charge rather than the delivery change. This is because the reservation and storage charge is payable by all customers. Since the costs are 'capacity enhancing', GAWB considered that the additional costs will increase long run marginal cost (LRMC), that is, the volumetric component of the reservation and storage charge.

GAWB estimated the effect of preparatory expenditure on prices from 2010-11 using the 2005 investigation with minor modifications. GAWB's original submission indicated that there would be an increase in the water reservation and storage change of $51/ML in 2010/11. However, in its supplementary submission, GAWB indicated that it had further developed its modelling to better estimate the pricing impacts, and provided a lower increase of $35/ML (2010-11 dollars). This change mainly reflected a change in the asset life for depreciation purposes.

GAWB's revised estimate represented about an 11% increase on the equivalent storage price at Awoonga Dam, and a lesser percentage increase in final prices for most customers once delivery charges are considered.

GAWB has not publicly released any estimates of the impact on prices of the updated cost of the full investment in the Fitzroy Pipeline. In its submission, GAWB indicated that, if pipeline construction is triggered, a significant additional price increase will be required.

Stakeholder Submissions

GPN supported GAWB's pricing philosophy.

However, other stakeholders expressed concern about the pricing impact of GAWB's proposals, specifically that:

- RTA stated that, in its submission, GAWB has not provided any indication, other than the capital cost, of the likely impact of the additional Fitzroy Pipeline on the long-term cost of water in Gladstone. There is no commercial pressure on GAWB to ensure effective management of the capital cost of the contingent supply strategy;

- RTA's view is that the higher the capital cost of the Fitzroy Pipeline, the more impact it will have on water prices. RTA is concerned about the magnitude of these costs but also that the current pricing mechanism is such that, if the industry as a whole reduces its water usage, this reduces the revenue pool for GAWB, which results in an even higher unit charge to its customers;

- QAL was concerned about the projected increase in water charges given that this is only for preparatory expenditures of $24.8 million; and

- QAL submitted that, from a customer perspective, GAWB's actual pricing lacks transparency and certainty. QAL stated it would prefer the Authority to become a fully empowered economic regulator and act as it does, for example, in setting access prices for a defined period and service standards.

QAL was also concerned that efforts to reduce demand have not resulted in any apparent pricing benefit. QAL considered that GAWB has recouped its lost revenue from QAL's reduction in consumption from the whole of the customer base, including QAL itself.

QCA Analysis

The Authority notes the concerns of customers such as RTA and QAL in regard to the impact of GAWB's strategy on prices and considers that GAWB should provide more guidance on possible pricing consequences.

Therefore, although the Authority does not propose to consider preparatory costs separately from the remainder of the costs of the related assets, it has reviewed GAWB's estimates for the purpose of providing greater information to customers

Indicative Pricing Impact of Preparatory Costs

To test GAWB's preliminary estimated pricing impacts, the Authority analysed the impact on prices based on GAWB's proposed total $24.8 million of preparatory costs, using the alternative demand scenarios as described in Chapter 3, over a 20 year time period commencing in 2010.

The Authority also incorporated a depreciation charge equivalent to the assets' useful lives rather than the 14 -year life used by GAWB.

On this basis, if the Fitzroy Pipeline was to be commissioned in 2010-11, and the preparatory costs included in customer charges thereafter, the component of charges for the preparatory costs is estimated to be $27/ML from 2010/11 under the low demand scenario and $24/ML under the high demand scenario.

Cardno's investigations indicated that asset creation costs could be deferred until after construction of the pipeline is commenced. Exclusion of these costs from preparatory expenditures would reduce the surcharge to $20/ML under the low demand scenario and $18/ML under the high demand scenario.

Indicative Pricing Impact of the Fitzroy Pipeline

Customers' submissions indicate that there is concern about the impact on prices if the Fitzroy Pipeline is actually developed and incorporated into GAWB's asset base.

To assess the impact on prices of the proposed contingent supply strategy, the Authority undertook further analysis to identify the potential indicative impact on prices to customers in 2010 of supply augmentation based on the alternative demand scenarios and a pipeline with the 30,000 ML per year capacity proposed in GAWB's submissions.

The pricing impacts were derived as the difference in the NPV of capital and related costs incurred in 2010 as compared to the timing of a normal demand augmentation under the alternative demand scenarios.

Under the low demand scenario, the augmentation would not be required until after 2030, that is, outside the 20-year timeframe. Hence, all costs associated with bringing forward the augmentation to 2010-11 would therefore be attributable to drought mitigation. By bringing forward the augmentation to 2010-11, rather than 2030, prices would need to increase by around $410/ML on average. On the high demand scenario, the price increase is of the order of $310/ML [although this estimate excludes the cost of another augmentation required before 2030]. These are significant increases which could have implications for customer demand and the attractiveness of the Fitzroy Pipeline.

The Authority stresses that this is an indicative estimate only, and is not intended to provide an indication of the increase in prices for individual customers. This is a matter for Stage (c) of the investigation.

Conclusions

Although the Authority does not propose to consider preparatory costs separately from the remainder of the costs of the related assets, it reviewed GAWB's estimates for the purpose of providing greater information to customers.

This review indicated that the preparatory costs proposed by GAWB would add $24 to $27/ML and those recommended by Cardno would add $18-20/ML

Of more relevance to customers is the impact on prices of the construction of the contingent supply. On the basis of the limited available information, the Authority estimates that under a low demand scenario, prices would need to increase by around $410/ML on average or under a high demand scenario by around $310/ML.

In response to QAL's view that the Authority should have more powers as an economic regulator, this is a matter of government policy. In this regard, however, the Authority notes that the Ministers accepted the Authority's recommendations, with minor qualifications, following the 2005 investigation of GAWB's pricing practices.

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