



Final Report

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

Stage A

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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
CSC	Calliope Shire Council
CSE	CS Energy
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CSO	Community Service Obligation
DBCT	Dalrymple Bay Coal Terminal
DMP	Drought Management Plan
DNRW	Department of Natural Resources and Water
DORC	Depreciated Optimised Replacement Cost
EIS	Environmental Impact Study
ERA	Economic Regulation Authority (WA)
ESC	Essential Services Commission (VIC)
FOI	Freedom of Information
FRP	Fitzroy River Pipeline
GAWB	Gladstone Area Water Board
GCC	Gladstone City Council
GEIDB	Gladstone Economic and Industry Development Board
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
MVS	Miriam Vale Shire
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 Final 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

In its initial submission regarding part (a), 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 to late 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

Based on comments provided by stakeholders in response to GAWB's proposals, the Authority released a Draft Report for comment. Responses to the Draft Report have been taken into consideration in this Final Report

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

With regard to the prudence of GAWB's contingent source strategy, the Authority concludes that:

- (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; and
- (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 reflect the relative level of effort applied to date to the evaluation of other available options, rather than the result of the evaluation of those options.

Following consideration of the relevant issues and taking account of stakeholder submissions, the Authority considers that:

- (a) 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;
- (b) GAWB should ensure that the necessary arrangements have been entered into to ensure a right of access to supplies of water from the Fitzroy River from mid-2012 should they be required;
- (c) GAWB should continue to work on options such as desalination, air and sea water cooling and alternative supply restrictions; and
- (d) GAWB should ensure that there is a significant level of customer support for its preferred contingent strategy option before proceeding with significant asset creation expenditure. 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.

In relation to the level and timing of efficient costs associated with the development of GAWB's contingent supply strategy that should be included in prices, the Authority considers that:

- (a) 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;

- (b) Asset creation should be deferred until the preferred contingent supply source is settled. Any items purchased in advance of construction will be at GAWB's own risk;
- (c) 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; and
- (d) Preparatory expenditures should be subject to an ex-post review before being considered for incorporation in the asset base, as proposed by GAWB.

In relation to the means by which the efficient costs of the contingent supply strategy should be included in prices in subsequent years, the Authority considers that:

- (a) Consistent with its general approach to regulatory pricing, efficient preparatory costs should be taken into account when determining prices at the next regulatory reset. In other words, prices determined at the next regulatory reset should include a return on capital in respect of efficient preparatory expenditure;
- (b) In general, efficient preparatory costs should not be incorporated into GAWB's regulated asset base until the assets related thereto are commissioned. Correspondingly, in general, depreciation of efficient preparatory costs should not commence until the assets related to the preparatory expenditure are commissioned or, if it is certain that the assets will not be commissioned because of changing circumstances, when that decision is taken. In the latter instance, the time period over which the efficient preparatory expenditures would be recovered would require particular consideration. To the extent that efficient preparatory expenditures diminish in value prior to commissioning of the assets to which they relate, the extent of any diminution in value should however be taken to account in pricing as should the costs of maintaining the currency of preparatory expenditure;
- (c) The appropriate WACC rate for capitalising preparatory costs is the WACC rate that applies from time to time to GAWB's regulated assets;
- (d) In accord with the Authority's current general practice, efficient preparatory costs should not be optimised out of the asset base without compensation other than under certain limited circumstances; and
- (e) It is inappropriate to consider the basis for recovering 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 matter should be considered in part (c) of the Ministers' Direction.

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. The Authority's conclusions are that:

- (a) The preparatory costs would add between \$18 and \$27/ML to prices; and
- (b) The impact on prices of the construction of the contingent supply is likely to be substantial. 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.

The analysis supporting these conclusions is set out in the body of the Final 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 Final 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 Final 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

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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;
- released a Draft Report 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 identified 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 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 indicated that it may be possible to fast-track the construction of the weirs for completion by mid to late 2010.

Under its Drought Management Plan, a low supply alert is triggered five years before anticipated supply failure, based on the assumption that average inflows over the five-year period are equivalent to the average of the worst three consecutive years of rainfall. A low supply alert is to be in place for one year, and if inflows have subsequently not recovered, restrictions of 10% of contracted demand are then to 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 two years and be in operation at the end of year three after the commencement of the DMP (by mid 2010).

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

GAWB 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 requested 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 Final 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 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.



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 Shire Councils 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 *Water Act 2000* 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 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 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 GAWB's preference for the Fitzroy Pipeline may reflect the relative level of effort directed to date to the Fitzroy option as opposed to other options.

The Authority considers that, under the worst case scenario postulated by GAWB (the average of the three 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 (three years).

As a result, the Authority considers that it is prudent for GAWB to continue working towards implementing the Fitzroy Pipeline option. Consistent with this, GAWB should ensure that arrangements are entered into to ensure a right of access to supplies of water from the Fitzroy River from mid-2012 should they be required.

In addition, the Authority considers that GAWB should continue to work on other options such as desalination, air and sea water cooling and alternative supply restrictions.

Finally, it is recommended that GAWB should ensure that there is a significant level of customer support for its preferred contingent strategy option before proceeding with significant asset creation expenditure. 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.

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 initial proposal focused 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

Draft Report

In its initial proposal, 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 was 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 was very large compared to other water businesses. In addition, the cost of holding such spare capacity was 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.

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; and
- 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 in response to GAWB's proposals did not focus on what constituted a 'prudent' response but rather focused on GAWB's proposed strategy.

In responding to GAWB's proposals, the Authority noted the various approaches to prudence and that there was no universally accepted regulatory definition of prudence. The Authority observed that, in a legal context, the Federal court¹ 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'.

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

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

The Authority concluded that adherence to such criteria should ensure that GAWB most effectively addresses its customers' demands, while any broader public interest matters can be addressed through relevant government policies and/or Ministerial Directions.

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

Stakeholder Submissions on Draft Report

No submissions dealt with the issue of prudence.

3.4 Assessment of Relevant Risks

In its initial proposal, GAWB 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
- potential drought risks.

Demand

Draft Report

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 subsequently provided a range of such forecasts to the Authority for consideration.

In responding to GAWB's submission, the GEIDB submitted that there was 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 in response to GAWB's proposals 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.

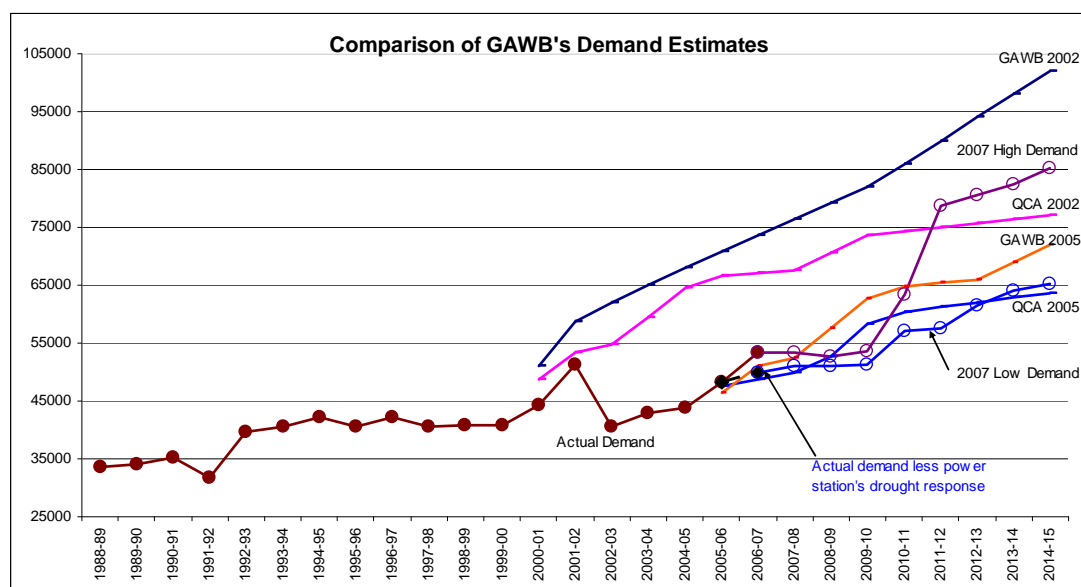
Callide Power Management (CPM) submitted that it was concerned about GAWB's previous history of over-estimating demand to support its proposed capital investment programme.

In the Draft Report, the Authority sought to validate the immediacy of the prospective new demand as well as the accuracy of past forecasts in seeking to verify whether an additional response was required to that offered by current infrastructure.

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

The Authority noted that 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



In the Authority's Draft Report, a range of demand scenarios was considered 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 incorporated 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 reflected a preliminary assessment of new demands considered to have a high probability of proceeding.

The differences between the scenarios in the early years were not significant, as demand could be predicted with reasonable certainty over the next three to four years. Table 3.1 refers.

Table 3.1 Comparison of Demand Scenarios

<i>Demand Scenario</i>	<i>2007-08</i>	<i>2008-09</i>	<i>2009-10</i>	<i>2010-11</i>	<i>2011-12</i>	<i>2015-16</i>	<i>2020-21</i>
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

In the Draft Report, the Authority accepted 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 sought not to assign any level of probability to each of the demand scenarios identified but, on the basis of historical precedent, considered that high demand scenarios were less likely. Such a conclusion was supported by preliminary consultations with customers. Furthermore, the Authority noted 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, the Authority concluded that the GEIDB should only be one source of information and that GAWB needed to take a balanced approach to demand assessment. The Authority considered that, 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 recognised 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's Draft Report considered the low and high demand scenarios in conjunction with alternate supply scenarios in determining the prudence of the various response strategies further below.

Stakeholder Submissions on the Draft Report

In responding to the Draft Report, GAWB considered that its interpretation of the Stage (a) investigation did not require it to undertake a detailed analysis of likely future demand. GAWB

emphasised its view that the upper bound demand scenario should be interpreted not as likely or forecast demand but as a possible demand scenario.

GEIDB questioned whether the Authority should use historical record as a reliable guide to future demand. While GEIDB acknowledged that over-estimation of future demand had previously occurred, it identified a discontinuity between the economic conditions prevailing from 1980 to 2005 and those from 2006 to 2030. GEIDB cited a World Bank publication which forecasts that world economic growth will be faster from 2006 to 2030 than it was from 1980 to 2005. GEIDB postulated that Gladstone's globally oriented mineral and energy driven economy will be influenced by this enhanced growth.

GEIDB maintained that demand increase is an important factor for the contingent water supply strategy and that the Authority did not attribute enough significance to demand.

The Authority's Analysis

In the Draft Report, the Authority concluded that demand risk was not an imminent concern for GAWB. However, it was a relevant risk for GAWB to monitor and manage.

Notwithstanding submissions from GAWB, the Authority considers that a range of plausible demand scenarios needs to be considered to establish the circumstances under which GAWB's contingent supply strategy, including selection of supply from the Fitzroy River as the appropriate contingent source, is prudent (as required under the Ministerial Direction).

The Authority also acknowledges the World Bank forecasts cited by GEIDB for world economic growth to escalate. However, the impact for Gladstone will depend on Gladstone's world competitiveness as an industrial site, taking into account availability of transport and port services, the impact of currency exchange rates and environmental factors.

The Authority's range of forecasts took into account scenarios developed by GAWB and those developed by independent consultants in consultation with customers. Some scenarios reflect historical trends, while others reflect the view of customers with access to detailed information on their market prospects.

The Authority proposes no change to the Draft Report's conclusions.

Supply

Draft Report

In its initial proposal, GAWB 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 indicated that its 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.

GAWB submitted 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 continued as the benchmark reliability standard, the volumes available from Awoonga Dam would 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.

In responding to GAWB's proposals:

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

In its Draft Report, the Authority noted that, since the last investigation, there has been no change to the Awoonga Dam's HNFY.

However, the Authority recognised the risk of further downgrades of the HNFY occurring in the future, citing GAWB's submission which indicated that there has been an apparent downward step-change in inflows in the Boyne River catchment since the late 1970's. However, it remained unresolved whether this was 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.

The Authority noted research undertaken by CSIRO (2005) in relation to the adjacent Fitzroy Basin which 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 noted 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 70,000ML until Awoonga Dam first overtops.

The Authority concluded that, while there was 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 was 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.

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

However, the Authority considered the magnitude or timing of any future adjustment, if any, to be 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 was considered to be the appropriate measure for long term planning purposes. Furthermore, the Authority accepted GAWB's observation that the significance of HNFY reduces where GAWB has confidence that it can manage supply shortages.

Stakeholder Submissions on Draft Report

No submissions were received in regard to supply risk.

The Authority's Analysis

In the Draft Report, the Authority concluded that a potential change to hydrology is a risk that GAWB faces, particularly if the current drought continues, although the magnitude or timing of any future adjustment (if any) to HNFY remains uncertain.

The Authority proposes no change to the Draft Report conclusions.

Drought Risk

Draft Report

In its initial proposal, 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-storage² 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 initial proposal 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 three-year sequence of inflows rather than the worst 10-year sequence. GAWB has identified the worst three 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 three 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 - five years from supply failure³, a low supply alert notice to customers, encouraging voluntary demand management strategies;
- Stage 2 – four years from supply failure, restrictions are applied at 10% of customers' reservation volumes; and
- Stage 3 – six 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.

The key comments from stakeholders in relation to GAWB's initial proposal 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

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.

- 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.

In its Draft Report, the Authority noted that there was some variation in the 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 its 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 three 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.

The Authority recognised that drought was an important risk facing GAWB, particularly given the reliance of the Awoonga Dam on low frequency major inflow events. The risk was 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.

The Authority noted that drought risk can be addressed through supply restrictions under GAWB's DMP, supply augmentations or other strategies.

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

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

For the purpose of triggering GAWB's DMP, a short term focus seemed appropriate as this would lead to an earlier imposition of restrictions. In this regard, it was 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 considered 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 were another matter. The Authority observed that 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 ten year flow scenarios when considering possible supply responses.

At the same time, the Authority accepted that GAWB's proposed average three year worst inflow scenario represented a suitable worst case scenario but at the same time did not 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 was considered to be a matter for stage (b) of the investigation.

Stakeholder Submissions on the Draft Report

CS Energy submitted that the triggering of the DMP based on the average three-year worst inflow was overly conservative.

The Authority's Analysis

In the Draft Report, the Authority concluded that drought risk was the key imminent risk confronting GAWB.

In response to CS Energy's submission, the Authority considers that, for the purpose of triggering GAWB's DMP, a short term focus seems appropriate, particularly given the continuing absence of rain. The Authority therefore considers that the three-year average inflow assumption is reasonable and that the possibility of even lower inflows (which would be of particular relevance should they occur over the next 12 months) cannot be discounted.

However, it is noted that the trigger to be adopted for the contingent supply strategy remains a matter for stage (b) of the investigation.

The Authority proposes no change to the Draft Report conclusions.

3.5 Demand-Supply Balance

Draft Report

GAWB's initial proposal indicated that GAWB can currently contract up to approximately 70,000ML per year based on its existing safe yield (that is, based on the current ten 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 three year worst consecutive inflow scenario) or demand spikes from new investment in the region.

In response to GAWB's initial proposals, 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 believed that the investment attractiveness of Gladstone would suffer heavily if spare capacity falls to 7,000ML per year.

However, GEIDB noted 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.

In the Draft Report, the Authority noted that 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 first overtopped.

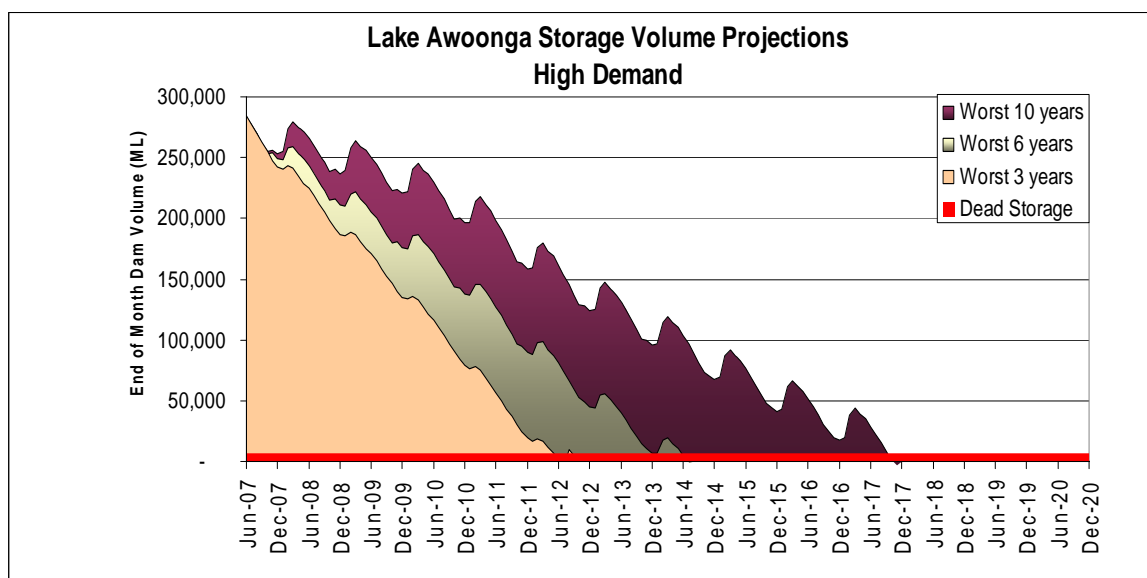
With current commitments at approximately 55,000ML per year, the Authority noted that GAWB has some 15,000ML of available supply remaining in Awoonga Dam to service new customers until Awoonga Dam is overtopped, with another 8,000ML becoming available once that occurs.

The Authority’s analysis indicated that, 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 five year period has been of the order of 17,000ML. Furthermore, experience with new customers is that delays of up to ten years can occur from when a project is first mooted to when demand commences. Hence, 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 was considered to be currently needed to increase supply to meet likely future demand per se. However, the current water allocations are based on the worst consecutive ten year inflows and there thus remained the potential need to increase supply to address the current drought.

The Authority’s assessment of the demand-supply balance with regard to immediate drought risks was based on the then storage levels of Awoonga Dam. Based on the high demand scenario, the Authority found that GAWB’s supplies of water could fail in 2012 if inflows consistent with the worst three year sequence prevailed. These dates took into account supply restrictions under GAWB’s current DMP. Figure 3.2 refers.

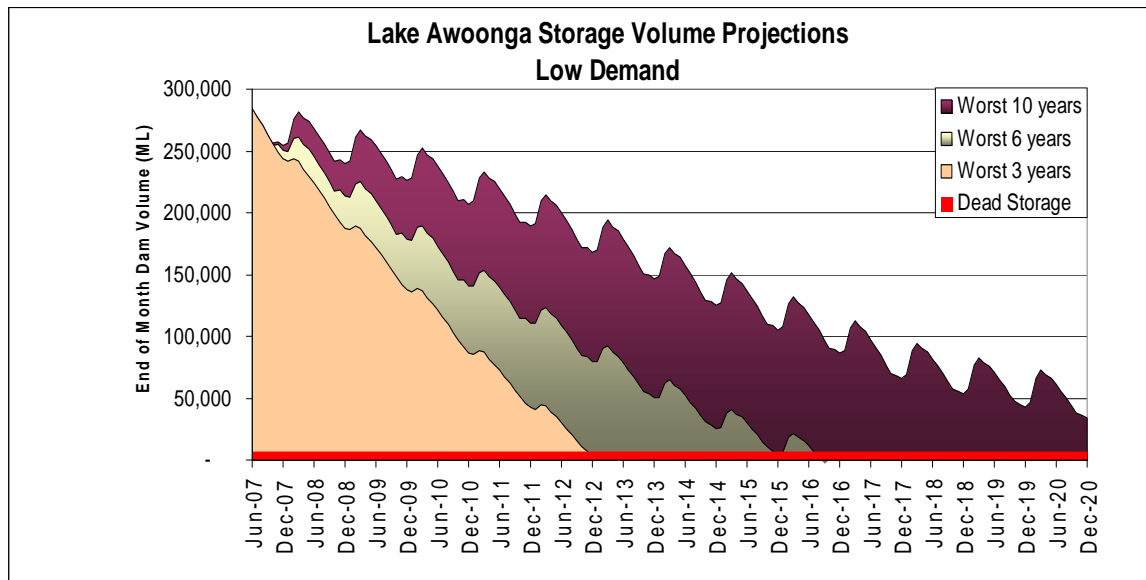
Figure 3.2 Projected Awoonga Dam Failure – High Demand Scenario and Various Inflow Scenarios



The Authority concluded that, should the lower demand scenario prevail, the timing of supply

failure did not alter significantly if it was assumed that inflows are limited to the worst consecutive three 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) was more significant for inflows corresponding to an average six year or ten year worst inflow sequence. For example, as Figures 3.2 and 3.3 show, with inflows equal to the worst consecutive six years, supply failure was projected to occur in late 2013 with the high demand scenario and mid 2016 with the low demand scenario.

The Authority's Draft Report concluded that, should normal conditions prevail, neither the high growth nor the low growth scenarios implied an immediate need for supply augmentation.

However, the Authority considered that continuing drought represented a risk that GAWB must actively manage. In this regard, a combination of the high demand scenario and inflows based on the worst three consecutive years provided a potential worst-case. Under this scenario, supply failure did 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 could not be entirely discounted and it was considered that it would be imprudent not to keep such a possibility under active consideration.

At the same time, it was recognised that the continued assumption of inflows at the worst three 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.

Stakeholder Submissions on the Draft Report

The GEIDB submitted that, as the world scale for major industrial projects gradually increases, it is to be expected that increments in water demand and other utilities would also increase. The GEIDB indicated that there is a high probability of an additional 4000ML per year being

committed by 2011, and a medium probability of a further 18,500ML by 2013. Based on its expectations that GAWB presently only has 10,000ML spare capacity, GEIDB submitted that there is a medium to high probability of a shortfall of 12,000ML by 2013.

The Authority's Analysis

In the Draft Report, the Authority concluded that, should normal conditions prevail, neither the high growth nor the low growth scenarios implied an immediate need for supply augmentation. However, the Authority considered that continuing drought represented a risk that GAWB must actively manage. The possibility of a failure in inflows in the coming wet season is a key risk driving GAWB's strategy. Accordingly, a combination of high demand and inflows based on the worst three consecutive years provides a potential worst-case scenario.

In relation to GEIDB's comments about the increasing size of new industrial projects, the Authority notes that this trend may be offset by the use of water efficient technologies to reduce their water needs. The Authority also notes GEIDB's claims for new demand growth and accepts them as being indicative of upside demand risk that must be managed. Nevertheless, the available 15,000ML (and potentially 23,000ML once the dam is overtopped) would seem a reasonable level of spare capacity to manage demand risk at this point in time, given that the largest single increment in the past was 11,000ML, and that only one of the potential new projects identified by GEIDB individually exceeds 10,000ML.

The Authority proposes no change to the Draft Report conclusions.

3.6 Preferred Response

Draft Report

In its initial proposal, GAWB 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).

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.

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

In regard to 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.

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

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 do not 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.

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.

In considering GAWB's proposals during the development of the Draft Report, the Authority noted that it was 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 were 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 noted that some such options could be implemented relatively quickly and could provide sufficient capacity to defer significant capital expenditure. The Authority therefore considered that these options should be addressed by GAWB with its customers.

The Authority's view was that GAWB's concerns that it does not control its customers' investment decisions was 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. While it was accepted that such strategies do not diversify sources, they do reduce demand which reduces the need for new and diverse sources.

The Authority accepted that GAWB has already exploited strategies such as supply restrictions through their DMP process. However, the Authority noted that the current DMP is relatively relaxed, with only 10% restrictions until six months before failure, and Calliope Shire Council (CSC) had indicated that it was 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 considered that GAWB should re-examine its DMP supply restriction regime.

The Authority was also aware that GAWB had initiated steps towards volumetric charging and secondary trading following the Authority's previous reviews. However, the Authority noted 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 noted that secondary trading had not occurred, potentially because customers do not hold separately transferable entitlements and trading must occur through GAWB. The Authority considered 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 noted that the small number of customers, with broadly similar water reliability requirements, is a constraint on trading.

In the Draft Report, the Authority indicated that 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. However, the Authority noted that GAWB already has a supply buffer in the form of spare capacity in Awoonga Dam.

The Authority also noted 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 were ultimately likely to be required, an important issue was the additional cost involved. Furthermore, the Authority recognised that there are no known sources of supply which could provide a supply buffer in the short term.

The Authority further recognised 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 noted that, while customers generally supported a contingent response in principle, there was limited support for the Fitzroy Pipeline option among customers, largely because of customers' concerns centred on its cost implications.

In assessing the various options against the criteria for a prudent response, the Authority found 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 considered that supply restrictions under the DMP which reduce consumption by only 10% over a 3.5 year period appeared to be too conservative and that a progression to a higher level of restrictions would help to prolong supplies. This was considered particularly important as the demand-supply balance problem facing GAWB is predominantly drought driven and could quickly turn around. It was suggested that GAWB should investigate such matters in conjunction with its customers.

The Authority concluded that demand management and on-site alternative supplies such as air cooling and sea water cooling could 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 analysed the expected impact on Awoonga Dam failure dates if air cooling of either two or four 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 was on a pipeline of 30,000ML per year. Table 3.2 refers.

It was found that, if the worst sequence of 3 year inflows is assumed, the air cooling option with all four units in the Callide power stations could delay failure until August 2012 for the high demand case or August 2013 for the low demand estimates. This timing was not dissimilar to that which occurs with the Fitzroy Pipeline. Furthermore, air cooling appeared capable of earlier implementation than the pipeline and, as such, seemed 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

<i>Demand Scenario</i>	<i>Inflow Option</i>	<i>No Response¹</i>	<i>Dry air cool 2 units</i>	<i>Dry air cool 4 units</i>	<i>Fitzroy Pipeline</i>
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.

The Authority also concluded that, 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 appeared 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 considered that a contingent supply strategy was appropriate as it enabled GAWB to be prepared to implement a supply solution within a two 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.

Stakeholder Submissions on the Draft Report

GAWB welcomed the Authority's conclusion that a contingent supply strategy is a prudent response to the demand and supply risks facing GAWB.

In relation to drought restrictions, which the Authority previously indicated could be too conservative, GAWB submitted that limited recognition was afforded by the Authority in regard to GAWB's experience in these matters, particularly the impact of early imposition of restrictions on customers.

GAWB further indicated that it had recently announced a Low Storage Alert to customers as part of its DMP. Under the DMP, this alert is triggered when the Awoonga Dam is less than five years from failure. GAWB also indicated that it is considering a curtailment policy by which it could buy back water during a Low Storage Alert as a substitute for restrictions.

In responding to the Authority's comments regarding demand management and on-site alternatives, GAWB believed these to be matters to be considered as part of Part (b) of the investigation. GAWB had interpreted the Part (a) investigation as being limited to the prudence of undertaking preparatory expenditures, the timing of preparatory expenditures and the selection of the Fitzroy Pipeline as the preferred option.

GAWB further submitted that, until such time as it is able to provide customers with relatively certain indicative prices for its preferred supply augmentation, there is no benchmark for determining the optimal economic outcome for customers. GAWB submitted that a proper evaluation of demand side measures should be undertaken in the context of a broader cost benefit analysis.

In relation to trading, GAWB indicated that there is no mandatory requirement for trading to occur through GAWB (as indicated by the Authority's Draft Report). From a practical perspective, GAWB needs to know how much water it is to deliver to each customer and ensure that adequate capacity is available. In GAWB's view, the absence of trading is due to the particular physical circumstances of the Gladstone market. GAWB also thought the Authority's comment on trading to be outside the scope of the Part (a) investigation.

The Authority's Analysis

In the Draft Report, the Authority concluded that a contingent supply strategy was appropriate.

In regard to the issues raised by GAWB:

- on supply restrictions, the Authority maintains its view that alternative restrictions could be a useful strategy in deferring a contingent supply source, particularly as CSC has previously indicated that it could absorb a higher level of restrictions than the industrial users;
- in relation to GAWB's proposed curtailment policy, the Authority considers that such an approach has merit as it recognises the differential capability of parties to reduce water consumption;
- in regard to demand management strategies, the Authority considers such strategies are relevant to decisions about whether or not to invest in preparatory works, and all options should be considered before committing to a particular response; and
- in regard to trading, as noted in the Draft Report, the Authority accepts GAWB's comments that trading opportunities may be limited in GAWB's circumstances.

The Authority supports GAWB's proposal to undertake a cost-benefit comparison of the alternatives.

The Authority proposes no change to the Draft Report conclusions, as the issues raised by GAWB, and addressed above, do not impact on the conclusion that a contingent supply strategy is appropriate.

3.7 The Proposed Contingent Supply Strategy

Evaluation Process and Criteria

Draft Report

In its initial proposal, GAWB's analysis of different supply options drew 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 two 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.

In 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 were duplicative and repetitive, and the relevance of some was 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 the annualised \$/ML estimates was misleading, as it assumed full operation immediately upon commissioning. CPM considered that this biased against more scaleable options such as air cooling of the power stations and desalination.

The Authority's Draft Report analysis identified the 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 considered 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. It was noted that 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 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 indicated that:

- very few surface water supply options would be able to deliver water within two years of commencement, particularly allowing for filling time. The Authority noted that GAWB's revised DMP allows four years of supply restrictions, and supplementary measures could prolong the need for a response;
- the criterion that additional water be available in 2010 was 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 three 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 could implement contractual arrangements to manage these matters; and
- the diversification criterion was considered to be relevant as a threshold criterion for supply options, as it specifically focused on supply-side risks associated with hydrological changes or drought.

In relation to additional measures which were raised in GAWB's submission, the Authority noted 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 referred to the potential for the new infrastructure to be integral to a regional water supply grid;
- the Authority accepted CPM's comment that the use of annualised cost estimates biases against scaleable options such as dry cooling (air cooling) and desalination. However, it was noted that GAWB had not used this measure as a threshold criterion but had 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 meant that GAWB considered that the risk of cost variation was greater for some options than others. However, each of the options included allowance for cost over-runs.

GAWB's criteria did not include any assessment of the options in regard to their financial implications for GAWB. GAWB's submission did 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.

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

The Authority considered 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 have included a more detailed economic analysis of those supply options still considered to be eligible for consideration, as well as the impact of options which may defer more costly supply augmentations.

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

The Authority also considered that 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 was also considered to 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.

The Authority considered there was also a need for GAWB to ensure that there was 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, before proceeding with significant asset creation expenditure.

Stakeholder Submissions on the Draft Report

GAWB welcomed the Authority's conclusion that the assessment and threshold criteria applied by GAWB were generally reasonable given imminent risks.

However, GAWB responded to the Authority's comment that GAWB needed to demonstrate customer support for its proposed contingency supply strategy. GAWB submitted that it had been in close contact with its customers and considers that it has the appropriate support. GAWB indicated that the process of securing long term contracts as part of its charter necessarily involves customer consultation and negotiation.

GAWB continued to have concerns regarding the possible investment in infrastructure located on premises over which GAWB has no direct control.

The Authority's Analysis

In the Draft Report the Authority concluded that GAWB's evaluation process and threshold criteria were generally reasonable in the face of drought risks. However, the Authority considered the ability of GAWB to control the investment should not be a threshold issue and considered that GAWB's evaluation process should have included a more detailed economic analysis of the supply options. The financial implications for GAWB were also considered to be a significant factor.

The Authority accepts GAWB's proposition that commercial contracts will provide an indication of the level of customer support for its proposed strategy. However, the Authority considers that it would be prudent for GAWB to take into account the likely level of customer commitment before proceeding with significant asset creation expenditure.

In regard to GAWB's ability to control ownership of the investment, the Authority considers that mutually acceptable arrangements for other options could be achieved and supported by contractual terms which provide GAWB with the necessary control over outcomes.

The Authority proposes no change to the Draft Report conclusion.

Selection of Contingent Supply Option

Draft Report

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 eight 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 initial proposal to the Authority, concentrated on the selection of an appropriate supply source which met the key threshold criteria, that water be available within two years from construction, and that water be available from 2010-11. The options which met the new threshold criteria 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 did 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 was 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 held 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 had 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 two remaining options, desalination involved greater operating and energy costs, and there was 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 initial proposal 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 18 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 proposed 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 considered it prudent to continue to gather further technical information on the desalination option, as part of preparatory expenditure on the contingent supply strategy. GAWB stated that the scalability and potential for advantages in co-location with industry

would be a particular focus of the investigation. This was to enable more fully informed future decision making.

In stakeholder submissions, the GEIDB, GPN and RTA supported 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 the Fitzroy system may be 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 would 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.

The Authority's Draft Report analysis focused on the assessment of the options against the threshold criteria. GAWB's application of threshold criteria effectively requiring provision of water within two years after detailed planning had been finalised, and requiring diversification of supply, severely limited 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.

The Authority identified 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) stated 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.

The Authority indicated that 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 also seemed valid, at least for addressing current drought circumstances.

In practical terms, these circumstances effectively reduced the range of supply options available for current consideration as a contingent supply strategy to the Fitzroy Pipeline and desalination. The Authority considered 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 considered 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.

The Authority suggested that there was also the need to continue the evaluation of air and sea water cooling. These are options which appeared 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 noted that, in its supplementary submission, GAWB acknowledged that adjacent water catchments may be subject to similar hydrological risks as the Awoonga catchments. However, the Authority noted 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 accepted that there is some degree of diversification achievable by sourcing water from the Fitzroy, the risks of changes in hydrology (ie HNFY) appeared 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 also seemed relevant for the Fitzroy. The Authority considered that GAWB should further investigate the hydrological risks of the Fitzroy, particularly in regard to the impacts of climate change;

- the Authority concurred that the scoring of desalination against the 'risk-to-cost' criterion in GAWB's updated assessment required 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 was simply a reflection of the different level of effort currently applied in costing these options. It was 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 was considered not relevant for the analysis. Indeed, should bi-directional flow be introduced, it was 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 was debateable. Both options entail management and engineering risk, but the Fitzroy Pipeline also incurs hydrology risks.

In regard to water sources, the Authority noted that a volume of 30,000ML per year of reliable water from the Lower Fitzroy was 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, it was noted that this commitment is subject to further investigation. The Authority suggested that 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 was that construction of the Eden Bann and/or Rookwood weirs remained on track for 2011, there was 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, the Authority considered that GAWB should ensure that it can access alternative supplies on an interim basis should they be required.

The Authority considered that stakeholder comments regarding the escalating costs of the Fitzroy Pipeline were relevant. The Authority noted 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 warranted a more comprehensive re-visiting of the economic analysis than that provided by GAWB.

The Authority considered that 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.

Further, a detailed analysis of the costs and benefits of air and sea water cooling also seemed 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.

The Authority also considered 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 would vary depending on the demand projections used.

The Authority concluded that 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.

In summarising its conclusions, the Authority had concerns that the preferred option may be affected by the relative level of effort directed to date to the Fitzroy option as opposed to other options.

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

However, as noted by GAWB, there was 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 was limited to the Fitzroy Pipeline. In this regard, if rains were to fail this summer, the period of time available to respond thereafter reduced 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 was also problematic given the planning lead times, environmental issues and construction period (3 years) required.

As a result, the Authority considered it 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, the Authority concluded that 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 noted 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 would require a more thorough analysis of long term demand projections than had been undertaken by GAWB.

Stakeholder Submissions on the Draft Report

GAWB welcomed the Authority's conclusion that it is prudent for GAWB to continue working towards implementing the Fitzroy Pipeline option. GAWB also noted that it would use all reasonable endeavours to comply with the Authority's recommendation that arrangements be in place to access alternative supplies of water from the Fitzroy River by mid-2012 should they be required.

GAWB supported and agreed with the Authority's conclusions that it is also prudent to direct effort to other options such as desalination, air and sea water cooling and alternative supply restrictions if circumstances allow.

GAWB submitted that the Fitzroy Pipeline is the least cost response to scenarios requiring the commencement of augmentation within 24 months. GAWB indicated that its Stage (b) submission would detail ex ante approvals processes before investment proceeds. This may result in augmentation of the total 30,000ML per year capacity either at one time, or by increment, depending on the trigger.

GAWB acknowledged and agreed with the Authority's suggestion that, under the worst case drought scenario, there is sufficient time to undertake investigations of potentially available options. GAWB advised that it had now issued a Low Supply Alert under its DMP, so that the time available to conduct further investigations is limited. The status of further investigations was advised by GAWB in relation to:

- desalination – GAWB indicated that it is seeking to spend about \$1 million to assess the feasibility of desalination, to better refine the cost estimates including whole-of-life operational costs and to improve GAWB's knowledge of environmental impacts. GAWB indicated that the cost of desalination is likely to increase above the mid-point estimate of \$338 million; and
- air and seawater cooling - GAWB had substantial reservations about the ability to deliver the quantum of water savings over the timeframes suggested by the Authority. However, GAWB suggested that it would encourage the power stations to submit firm commercial proposals prior to a decision being required in respect of the Fitzroy pipeline, to enable a full cost benefit analysis to be performed. GAWB indicated that, as these options would result in lower prices for the power stations and higher prices for other customers, it would welcome the Authority's guidance on the transfer of value to the power stations as part of the Part (b) investigation.

GAWB submitted that the Authority's concerns that the preferred option may be affected by the relative level of effort directed to the Fitzroy option as opposed to other options were inappropriate. GAWB indicated that it had developed a base case and alternate scenarios, consulted widely using its Strategic Water Plan and selected an option which has the public support of Government.

GAWB acknowledged the Authority's suggestion that more work be done on the hydrology of the Fitzroy catchment. However, GAWB emphasised the magnitude of the flow of the Fitzroy River and its geographic diversity.

In regard to making price implications public, GAWB proposed to publish indicative prices in the near future.

CS Energy considered that GAWB has unduly focused on the Fitzroy River Pipeline to the exclusion of other alternatives.

GCC provided some comment with respect to the new Gladstone Regional Council. GCC submitted that, with the Miriam Vale Shire (MVS) being amalgamated with Gladstone City and Calliope Shire and the MVS currently proposing a desalination plant for the Agnes Water area, it would seem prudent that the option of GAWB owning and operating the desalination plant should be investigated. GCC also suggested that GAWB should also secure an allocation under the Baffle Creek WRP.

The Authority's Analysis

In the Draft Report the Authority concluded 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;
- 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;
- 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;
- GAWB should confirm that there is a firm commitment for supplies to be available from Eden Bann and/or Rookwood Weirs; and
- GAWB should ensure that arrangements have been entered into to ensure a right of access to alternative supplies of water from the Fitzroy River from mid-2012 should they be required.

The Authority notes that GAWB's submission in response to the Draft Report generally supports the Authority's recommendations. The Authority particularly notes that GAWB proposes to determine the appropriate response, including the scale of the Fitzroy Pipeline, as part of the Stage (b) investigation.

The Authority accepts that major demand management initiatives such as air-cooling could have significant effects on relative pricing, but considers that this needs to be considered within the context of the overall pricing forming Part (c) of the investigation.

The Authority continues to hold the view that GAWB's preference for the Fitzroy option may reflect the relative level of effort applied to date to the evaluation of available options, rather than the result of a complete evaluation of those options. This is particularly relevant as the relative costs of some options may be changing (for example, according to Cardno (2007), desalination costs are generally falling relative to overall construction costs). The Authority accepts GAWB's commitment to further explore such options.

In regard to GCC's submission, the arrangements regarding water supplies for Miriam Vale from a desalination plant are outside the scope of the present investigation which is focused on a contingent supply strategy. However, the Authority reiterates its view that GAWB should be proactive in seeking opportunities within the Baffle Creek WRP.

The Authority proposes no change to the Draft Report conclusion.

3.8 Summary

Following consideration of the relevant issues and taking account of stakeholder submissions, the Authority considers that:

- (a) 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;
- (b) GAWB should ensure that arrangements have been entered into to ensure a right of access to supplies of water from the Fitzroy River from mid-2012 should they be required;
- (c) GAWB should continue to work on other options such as desalination, air and sea water cooling and alternative supply restrictions; and
- (d) GAWB should ensure that there is a significant level of customer support for its preferred contingent strategy option before proceeding with significant asset creation expenditure. 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.

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 did not request 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 settled. Any items purchased in advance of construction will be at GAWB's own risk;*
- 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 for more time to review other options; and*
- preparatory expenditures should be subject to an ex-post review before being considered for incorporation in the asset base, 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 initial proposal outlined 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 did not seek approval of the actual level of expenditure of the type outlined that it will undertake and instead suggested that an ex post review before the 2010 price reset was required 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 sought to respond to the Ministerial Direction in the manner requested by GAWB.

4.2 Efficient Preparatory Expenditure

Types of Expenditure

Draft Report

GAWB's initial proposal 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.

The Authority noted that 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.

The Authority also noted that 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.

In response to GAWB's proposals, there was some stakeholder 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.

In the Draft Report, in view of the identified uncertainties, the Authority proposed to accept GAWB's submission that the levels of expenditures be subject to an ex-post review before being incorporated in prices. This would allow the Authority to take specific market circumstances for individual components, such as land valuations, into account.

The Authority proposed 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 noted that GAWB's customers 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.

The Authority found that 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 included 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).

For the purposes of its assessment, 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, 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, e.g. power, telecommunications and 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, the Authority considered that additional operational expenditures such as project management, approvals, consultation and communication, engineering and investigations and land acquisition incurred either before or after June 2007 were appropriate where they related to the relevant contingent supply strategy.

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

The Authority noted that GAWB perceived financial benefits from procuring certain items to avoid fast-tracking of the subsequent construction process. The Authority supported such an approach provided that the purchase met 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, the Authority considered that it was for GAWB to satisfy the Authority that its approach was consistent with the proposed criteria prior to the 2010 reset.

In summary, therefore, apart from asset creation expenditure, the nominated generic types of expenditure were considered 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.

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 considered 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 would be considered as part of the 2010 price review, using the Authority's usual eligibility criteria.

Stakeholder Submissions on the Draft Report

GAWB noted that the purpose of preparatory expenditure was to keep its options open, and that it is not locked into the Fitzroy option. The purpose of the preparatory expenditure was to delay commitment to the Fitzroy option as long as possible.

GAWB acknowledged the Authority's comment that additional operational expenditures are considered appropriate where they relate to the relevant contingent supply strategy.

However, GAWB submitted that asset creation expenditure, where demonstrated to be necessary to ensure delivery of the contingent solution by 2010, should be approved. GAWB submitted that it would need to commence acquiring assets which will directly benefit the efficient construction of any option.

The Authority's Analysis

In the Draft Report, the Authority concluded that, apart from certain (deferrable) asset creation expenditures, the nominated generic types of expenditure were appropriate. Further, other types of expenditure may subsequently prove to be justified, including asset creation costs required to be expended to deliver the construction program for the contingent supply option once this is established.

Under the Authority's approach, any such asset creation expenditure would be approved for inclusion in the regulated asset base on an *ex-post* basis. At the same time, the Authority

accepts that asset creation expenditure may be necessary as part of preparatory expenditures to ensure delivery of water from 2010, but only once the most appropriate contingent supply strategy has been established.

The Authority proposes no change to the Draft Report conclusion.

Level of Efficient Preparatory Costs

Draft Report

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

Table 4.1 GAWB's Forecast Expenditure by Type for the Fitzroy Pipeline

<i>Forecast Capital Expenditure (\$m)</i>	<i>2006/07</i>	<i>2007/08</i>	<i>Total</i>	<i>Percentage of Total (%)</i>
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.

The Authority noted that 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.

Further, the 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.

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

GEIDB commended GAWB's 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.

In the Draft Report, the Authority noted that, although GAWB had not requested ex ante endorsement of the level of preparatory costs, the Ministers' Direction required the Authority to have regard to the level of efficient preparatory costs associated with the development of the contingent supply strategy.

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

The Authority found insufficient information to confirm or reject proposed costs with certainty, although the Authority was aware that estimates could 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 did 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 proposed 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 was also considered in Chapter 5.

Stakeholder Submissions on Draft Report

No submissions were received in response to the Draft Report regarding the level of preparatory expenditures.

The Authority's Analysis

In the Draft Report, the Authority proposed 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
- the cost of the works is reasonable, that is, it is economically efficient.

The Authority proposes no change to the Draft Report conclusion.

4.3 Timing of Preparatory Expenditure

Draft Report

In its initial proposal, 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 had 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, were 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 was on the critical path and was 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.

The 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. RTA suggested that 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 previously supported developing augmentation options for a speedier completion path, including undertaking long lead time but low cost planning items, the benefit of which was to delay 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.

In the Draft Report, the Authority considered that the appropriate timing of preparatory expenditures essentially depended on the time required to complete the preparatory tasks and the shelf-life or currency of the preparatory works.

As a general principle, the Authority considered that 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 it was considered premature to conclude that the Fitzroy Pipeline should be the preferred contingent supply option, the Authority was 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 three years to complete, but can be expedited for critical or emergency projects, such as drought relief projects declared by the government. Cardno considered that two 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

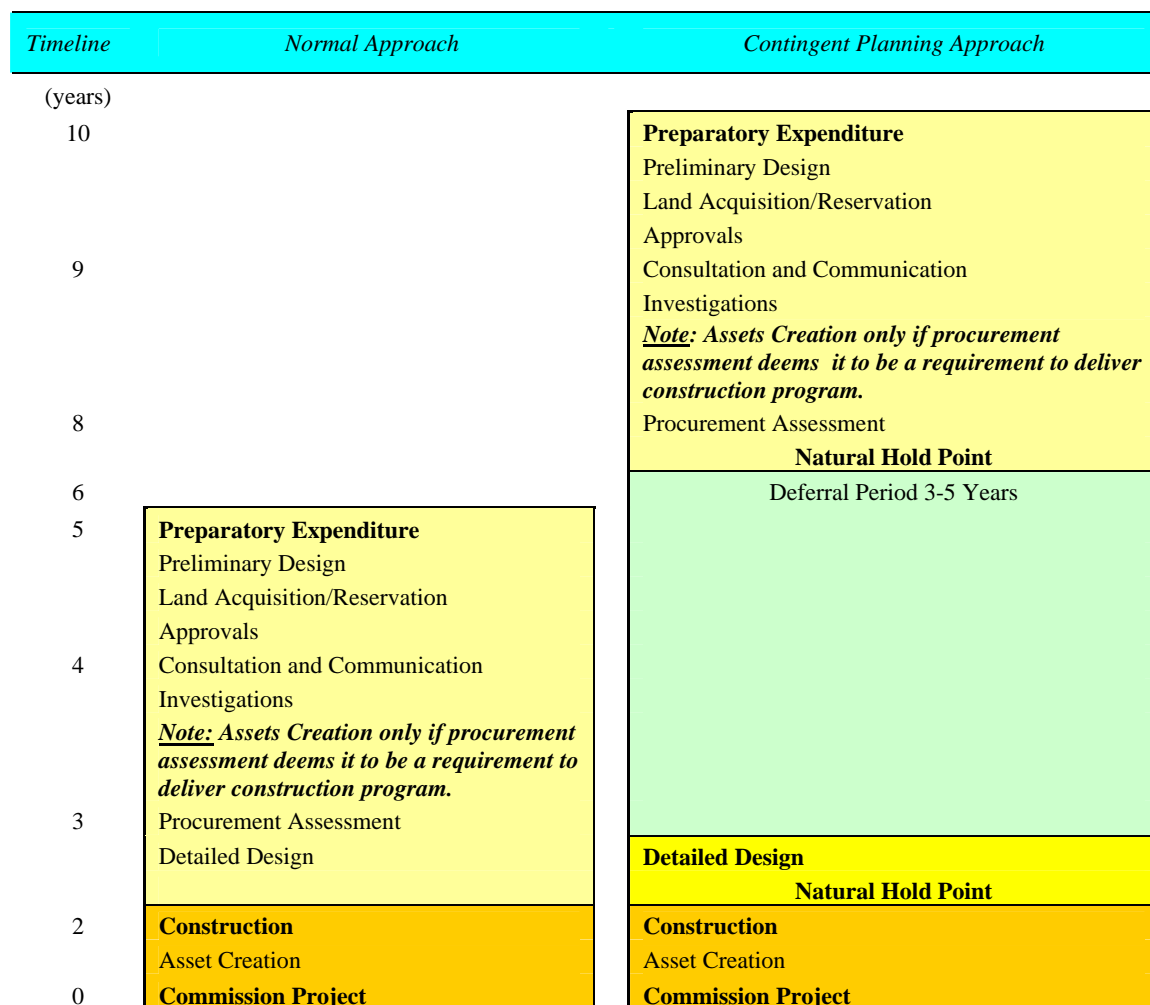
projects can be completed within about two years of achieving this hold-point, even when the construction market is tight.

This scenario was generally consistent with GAWB’s proposals, in that GAWB has a two-year timeframe for preparatory works.

Cardno suggested that, in the absence of urgent circumstances, if the trigger for construction is three to five 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 suggested 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 ten years before commissioning, compared to a normal development programme over five years. In the absence of urgent circumstances, Cardno suggested that a trigger could be set for detailed design to be done three years before, with a further trigger for construction two years before.

Figure 4.1 Timing of Preparatory Expenditure



The Authority also considered that some elements of the preparatory works may devalue or become redundant and that there was therefore a risk that such costs would need to be

re-incurred if the actual construction was deferred into the future. The Authority concluded that there was 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 five to seven years would it be worth halting environmental and other surveys, investigations and approvals once they have been initiated.

The Authority noted 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 allowed for two trigger points rather than one as suggested by GAWB, although in urgent circumstances, the timeline may be compressed.

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

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

Stakeholder Submissions on the Draft Report

No submissions in response to the Draft Report addressed the issue of the timing of preparatory expenditures.

The Authority's Analysis

In the Draft Report, the Authority concluded that:

- 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;
- there are potentially two trigger points for preparatory expenditures, one for most preparatory expenditures and a second that would defer detailed design and procurement planning until as late as possible; and
- a detailed execution schedule should be provided to customers for comment.

The Authority proposes no change to the Draft Report conclusions.

4.4 Summary

In relation to the level and timing of efficient costs associated with the development of GAWB's contingent supply strategy that should be included in prices, the Authority considers that:

- (a) 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;
- (b) Asset creation should be deferred until the preferred contingent supply source is settled. Any items purchased in advance of construction will be at GAWB's own risk;
- (c) 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; and
- (d) Preparatory expenditures should be subject to an ex-post review before being considered for incorporation in the asset base, as proposed by GAWB.

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. GAWB also postulated that the benefits of the preparatory expenditure extended 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, consistent with its general approach to regulatory pricing, efficient preparatory costs should be taken into account when determining prices at the next regulatory reset. The appropriate WACC rate for capitalising preparatory costs is the WACC rate that applies from time to time to GAWB's regulated assets.

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

The Authority considers it 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 matter should be considered in part (c) of the Ministers' Direction.

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 to 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 initial 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

Draft Report

In its initial proposal, 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 to be consistent with what would have resulted if this expenditure had been forecast as part of the 2005 pricing practices investigation.

The Authority noted that, 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).

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

In the Draft Report, the Authority reiterated the position taken in its 2005 investigation of GAWB's pricing practices (specifically in relation to capacity expansion) 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 proposed 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, the Authority considered that the asset valuations rolled into the asset base would also be subject to the usual tests that the scope, standard and cost of the works are reasonable, consistent with GAWB's proposals.

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 was consistent with the outcome that would have occurred had the preparatory costs been considered at the time of the 2005 review. Accordingly, the Authority considered that GAWB's proposal was reasonable. A revised WACC would of course apply for the next review period.

The Authority agreed 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 proposed that work in progress (WIP) not be rolled in to the asset base until the works are commissioned.

The Authority concluded that, 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.

Stakeholder Submissions on the Draft Report

GAWB did not support the Authority's approach of treating preparatory expenditures as work in progress. GAWB proposed that the work done on a contingent supply strategy has an immediate benefit for existing customers as it defers the need for early major expenditure. The expenditure is in effect an insurance policy and should not be treated as the first stage of an inevitable construction process. Accordingly, GAWB submitted that these costs should be recovered in prices from 2010-11.

No other stakeholders commented on this issue.

The Authority's Analysis

In the Draft Report the Authority concluded that GAWB's preparatory costs should be treated as work in progress and, once the relevant assets were commissioned, included as part of the capital costs of the infrastructure and be subject to normal return on and return of capital. Further, the Authority accepted the WACC rate proposed by GAWB to capitalise the preparatory expenditures as the WACC set at July 2005.

The Authority's position reflected the positions previously taken by it in regulatory decisions.

GAWB appears to be concerned that preparatory expenditure will not be included in pricing decisions prior to works being commissioned. However, this is not the case.

Under the Authority's general approach to regulatory pricing, anticipated capital expenditure is included in the pricing model regardless of whether or not the assets to which the expenditure relates are commissioned during the regulatory period. Accordingly, efficient preparatory costs should (and would) be taken into account when determining prices at the next regulatory reset. In other words, prices determined at the next regulatory reset will include a return on capital in respect of efficient preparatory expenditure.

However, in general, efficient preparatory costs should not be incorporated into GAWB's regulated asset base until the assets related thereto are commissioned.

Correspondingly, in general, depreciation of efficient preparatory costs should not commence until the assets related to the preparatory expenditure are commissioned or, if it is certain that the assets will not be commissioned because of changing circumstances, when that decision is taken. In the latter instance, the time period over which the efficient preparatory expenditures would be recovered would require particular consideration. To the extent that efficient preparatory expenditures diminish in value prior to commissioning of the assets to which they relate, the extent of any diminution in value should however be taken to account in pricing as should the costs of maintaining the currency of preparatory expenditure.

The appropriate WACC rate for capitalising preparatory costs is the WACC rate that applies from time to time to GAWB's regulated assets.

The Authority proposes no change to the Draft Report conclusions.

5.3 Optimisation

Draft Report

In its initial proposal, GAWB indicated that it expected 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 became 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.

In stakeholder submissions, GPN supported GAWB in its proposal that, if the Fitzroy Pipeline option became redundant, that GAWB would be compensated for the costs incurred as appropriate.

The Authority accepted 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 would 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 reiterated its general approach as stated in the Final Report of the GAWB investigation (2005) and in other draft access undertakings (e.g. QCA 2005b; QR 2006c).

Under this approach, the Authority would not 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 proposed 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.

The Authority further proposed that 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 would be appropriately considered at the time they would apply.

Stakeholder Submissions

GAWB welcomed the Authority's conclusion that prudent preparatory costs should not be optimised out of the asset base without compensation.

The Authority's Analysis

In the Draft Report, the Authority concluded that;

- preparatory costs assessed as being efficient, prudent and appropriate would not be subject to future optimisation without compensation to GAWB, subject to certain provisos; and
- 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.

The Authority proposes no change to the Draft Report conclusions.

5.4 Cost Allocation

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

In its original proposal, 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 cited 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.

In 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.

In the Draft Report, while the Authority noted the views of GAWB and the various stakeholders on this matter, the Authority considered 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 indicated that such costs should be capitalised as work in progress until the asset is commissioned. Furthermore, the Authority considered that they should be treated in the same manner as the assets to which they relate.

The Authority noted 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 was considered to be 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 noted 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.

Stakeholder Submissions

GCC submitted that future industry and development should be levied a 'headworks charge' so that existing ratepayers are not burdened unnecessarily.

The Authority's Analysis

The Authority remains of the view that the recovery of preparatory costs should be considered as part of the overall approach to pricing to be considered in Stage (c) of the investigation.

Therefore, the Authority proposes no change to the Draft Report conclusions.

5.5 Pricing Impacts

Draft Report

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 charge. 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 charge 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.

In stakeholder submissions, GPN supported GAWB's pricing philosophy.

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

- 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.

In the Draft Report, the Authority noted the concerns of customers such as RTA and QAL in regard to the impact of GAWB's strategy on prices and considered that GAWB should provide more guidance on possible pricing consequences.

Therefore, although the Authority did 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.

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 was 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

The Authority noted that customers' submissions indicated that there was concern about the impact on prices if the Fitzroy Pipeline was 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 would be of the order of \$310/ML, although this estimate excluded the cost of another augmentation required before 2030. The Authority considered that these were significant increases which could have implications for customer demand and the attractiveness of the Fitzroy Pipeline.

The Authority stressed that these were indicative estimates only, and were not intended to provide an indication of the increase in prices for individual customers. This was considered a matter for Stage (c) of the investigation.

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

Stakeholder Submissions on the Draft Report

GCC, representing the combined new regional council, responded to comments by the Authority that it estimated 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. This was a concern to GCC on the basis that this equates to a 36.5% to 49.4% increase on current prices.

The Authority's Analysis

The Authority provided indicative estimates of the impact of the full investment in the Fitzroy Pipeline under alternative demand scenarios to assist stakeholders in responding to GAWB's proposals. Apart from GCC, no submissions were received from GAWB's customers.

In the Draft Report, the Authority indicated that:

- based on preliminary investigations, the preparatory costs proposed by GAWB would add \$24 to \$27/ML and those recommended by Cardno would add \$18 to 20/ML;
- the issue should be considered in greater detail in Part (c) of the investigation; and
- the impact on prices of the construction of the contingent supply is likely to be substantial. On the basis of the limited available information, the Authority estimated 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.

5.6 Summary

In relation to the means by which efficient costs of the contingent supply strategy should be included in prices in subsequent years, the Authority considers that:

- (a) Consistent with its general approach to regulatory pricing, efficient preparatory costs should be taken into account when determining prices at the next regulatory reset. In other words, prices determined at the next regulatory reset should include a return on capital in respect of efficient preparatory expenditure;
- (b) In general, efficient preparatory costs should not be incorporated into GAWB's regulated asset base until the assets related thereto are commissioned. Correspondingly, in general, depreciation of efficient preparatory costs should not commence until the assets related to the preparatory expenditure are commissioned or, if it is certain that the assets will not be commissioned because of changing circumstances, when that decision is taken. In the latter instance, the time period over which the efficient preparatory expenditures would be recovered would require particular consideration. To the extent that efficient preparatory expenditures diminish in value prior to commissioning of the assets to which they relate, the extent of any diminution in value should however be taken to account in pricing as should the costs of maintaining the currency of preparatory expenditure;
- (c) The appropriate WACC rate for capitalising preparatory costs is the WACC rate that applies from time to time to GAWB's regulated assets;
- (d) In accord with the Authority's current general practice, efficient preparatory costs should not be optimised out of the asset base without compensation other than under certain limited circumstances; and

- (e) It is inappropriate to consider the basis for recovering 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 matter should be considered in part (c) of the Ministers' Direction.

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