



Final Report

**Burdekin Haughton Water Supply
Scheme: Assessment of Certain Pricing
Matters relating to the Burdekin River
Irrigation Area**

April 2003

FOREWORD

This Report responds to a Direction by the Premier and Treasurer (the Ministers) for the Authority to assess certain matters relating to gazetted prices for channel and river irrigators receiving water infrastructure services provided by SunWater within the Burdekin Haughton Water Supply Scheme (the Scheme).

The Report is the culmination of an extensive consultation and assessment process which included initial stakeholder submissions, a visit to stakeholders in the Burdekin area, the use of independent experts to determine appropriate cost estimates, the release of a Draft Report outlining the Authority's preliminary views, and two further rounds of stakeholder consultation, including the production and circulation of detailed comments by the Authority on the comments received from stakeholders on the Draft Report.

It appears to the Authority that some stakeholders may have misunderstood the Direction given to the Authority by the Ministers. There is a clear distinction between the terms of the Direction and that which the Authority perceives some stakeholders would have wished the Authority to have assessed.

It is important for all stakeholders to recognize that the Authority may only respond to the terms of the Direction given to it. In light of that, it is important to outline two particularly important matters which lie outside the Authority's remit and thus are not addressed in the Report.

Firstly, the Authority is unable to address the validity of lower bound costs. The Ministerial Direction¹ expressly directs the Authority to accept the lower bound costs included in the relevant prices. This also precluded the Authority from assessing whether local management would result in a decrease in lower bound costs. Whilst such an approach is consistent with the Direction, the Authority notes that these are important issues for irrigators and that the failure to be able to address issues relating to lower bound costs perpetuates concerns relating to the appropriateness of gazetted prices for services provided by SunWater to irrigators in the Burdekin, irrespective of the Authority's findings.

Secondly, the Authority was not directed to determine the level of prices which should be levied on irrigators. That is, the Authority was not directed to reset current price paths based on current conditions or the particular circumstances of the Burdekin.

It should also be noted that the conclusions reached by the Authority in respect of the Burdekin Scheme can not necessarily be extended to other schemes as the circumstances of each scheme may vary.

¹ Includes the associated Ministerial correspondence.

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GLOSSARY

ABARE	Australian Bureau of Agricultural and Resource Economics
ACCC	Australian Competition and Consumer Commission
ACTEW	Australian Capital Territory Electricity and Water
AHD	Australian Height Datum
ARMCANZ	Agricultural and Resource Management Council of Australia and New Zealand
ASMC	Australian Sugar Milling Council
ASX	Australian Stock Exchange
BCG	Boston Consulting Group
BRIA	Burdekin River Irrigation Area
BRIAC	Burdekin River Irrigation Area Committee
CAPM	Capital Asset Pricing Model
CCA	Current Cost Accounting
COAG	Council of Australian Governments
CPI	Consumer Price Index
CSO	Community Service Obligation
DAC	Depreciated Actual Cost
DLWC	NSW Department of Land and Water Conservation
DNRM	Queensland Department of Natural Resources and Mines
DORC	Depreciated Optimised Replacement Cost
EV	Economic Value
FSL	Full Supply Level
GAWB	Gladstone Area Water Board
GOC	Government Owned Corporation
GPOC	Government Prices Oversight Commission (Tasmania)
IC	Industry Commission
ICRC	Independent Competition and Regulatory Commission (formerly IPARC)

IPARC	Independent Pricing and Regulatory Commission - ACT regulatory body
IPART	Independent Pricing and Regulatory Tribunal - NSW regulatory body
IROL	Interim Resource Operations Licence
IWA	Interim Water Allocation
MDCC	Mareeba Dimbulah Customer Council
ML	Megalitre
MRP	Market Risk Premium
NCC	National Competition Council
NCP	National Competition Policy
NEC	National Electricity Code
NECG	Network Economics Consulting Group Pty Ltd
NPV	Net Present Value
NRV	Net Realisable Value
ODV	Optimised Deprival Value
Ofwat	Office of the Water Regulator - UK water industry regulatory body
OffGAR	Office of Gas Regulation, Western Australia
Opex	Operating Expenditure
ORG	Office of the Regulator General - Victorian regulatory body
OTTER	Office of the Tasmanian Energy Regulator
QCA	Queensland Competition Authority
QFF	Queensland Farmers' Federation
RoC	Return on Capital
ROL	Resource Operations Licence
SAIPAR	South Australian Independent Pricing and Access Regulator
SCARM	Standing Committee on Agriculture and Resource Management
SCI	Statement of Corporate Intent
SKM	Sinclair Knight Merz

SMEC	Snowy Mountains Engineering Corporation
SWP	State Water Projects
WACC	Weighted Average Cost of Capital
WRC	Water Resources Commission (a predecessor of SunWater)
WRP	Water Resource Plan
WRU	Water Reform Unit

1. EXECUTIVE SUMMARY

1.1 Ministerial Direction

The Authority has been directed to assess four specific issues with respect to the Burdekin River Irrigation Area (BRIA) within the Burdekin Haughton Water Supply Scheme (the Scheme), namely:

- (a) the level of capital contributions made by irrigators, the Commonwealth and State Governments to the Scheme;
- (b) the appropriate weighted average cost of capital (WACC) to be incorporated in the price of providing water infrastructure services in the Scheme;
- (c) whether the current price paths incorporate any excess return on capital based on an analysis of the preceding matters [and a necessary assessment of the appropriate capital cost of the Scheme]; and
- (d) under what circumstances is it appropriate to charge a positive rate of return on scheme assets [a generic issue, not necessarily specific to the Burdekin].

A copy of the Ministerial Direction and accompanying correspondence forms Appendix A.

1.2 The Scheme

The Burdekin Haughton Water Supply Scheme includes the Burdekin Falls Dam, completed in 1987, a number of weirs on the Burdekin and Haughton Rivers, and three major channel distribution systems (see Figure 1.1). SunWater, the service provider for the Scheme, was corporatised on 1 October 2000 and is required to operate as a commercial entity.

The Scheme supplies the Burdekin River Irrigation Area, the North and South Burdekin Water Boards and NQ Water.

Pricing policies for the Burdekin River Irrigation Area have varied over time and, while prices have increased in nominal terms, the price of water has been almost constant in real terms since 1980. Gazetted prices introduced in October 2000 were set for a five-year period.

1.3 Position Statements

In addressing the matters raised in the Direction, the Authority reached a number of positions on which its formal conclusions are based, as outlined below. Insofar as they relate to dollar amounts and rates of return, these figures are applicable to October 2000 being the date when the gazetted prices under review were established.

Capital Contributions and Asset Valuation

- (a) The appropriate basis for determining the capital value of the Scheme and any associated capital contributions is Depreciated Optimised Replacement Cost (DORC). The optimisation of the asset base reduced the capital cost of the Scheme for pricing purposes from \$462.5 million to \$421.1 million. Major items optimised included excess capacity in the Burdekin Dam, excess capacity in the Elliot Main Channel, distribution regulators, some above ground channels, and the Haughton Main Pump Station. In addition, the Authority has only incorporated those assets relevant to the provision of services to BRIA in the asset base for pricing purposes;

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- (b) It should be noted that, contrary to the statements made by a number of stakeholders, other regulators, and in particular IPART, do not, and have not, always valued past investments at zero, even in the water industry;
- (c) The Scheme should be viewed as an integrated development with payments from various sources contributing towards its overall capital cost. Irrigators' payments for land, water allocations and headworks contributions were intended to be off-set against the capital costs of the Scheme and irrigators expected that future prices would be adjusted to reflect these payments. The value of these contributions to BRIA irrigators is \$56.6 million (after depreciation);
- (d) Commonwealth and State payments were made with the intention of proceeding with the Burdekin Scheme because of its perceived economic benefits, including regional benefits. However, this is not the same as saying that the Commonwealth or the State intended that, regardless of capacity to pay, no user, current or future, should ever have to pay a price for water which included a return on the total funding provided by the Commonwealth or the State;
- (e) While some irrigators may have inferred (or hoped) otherwise, from the press reports surrounding Townsville urban water pricing, there was no substantive basis for irrigators to form a reasonable expectation that their water prices would never incorporate any return on the Commonwealth funding; and
- (f) The capital contributions made by growers have not been extinguished by less than efficient pricing since the commencement of the Scheme as to do so would be to negate the intended benefit of the conscious government policy in existence at the time.

Policy Changes

- (a) It should be noted at the outset that prices to irrigators in the Burdekin have not changed in real terms, although the structure of prices changed in October 2000 with a higher fixed component and a lower volumetric charge. Furthermore, an increase in prices in line with inflation appears consistent with irrigators' stated expectations;
- (b) The Authority accepts that that the issue of a return on capital was not discussed during the period leading up to the commencement of the Scheme. In addition, the Queensland Government has not always clearly articulated its future pricing policy, particularly in respect to matters such as the rate of return on capital. However:
- in the absence of any actual or implied contractual arrangements, the government has the power to alter existing pricing arrangements even though the changes may adversely impact on a particular individual or group of individuals. Further, the Authority's legal advice is that there are no actual or implied contractual arrangements in respect of BRIA irrigators;
 - on the basis of legal advice received, the Authority has concluded that there does not appear to be any evidence to support general claims for misleading or deceptive conduct, equitable estoppel, or negligent mis-statement.

Furthermore, the Authority considers that the same conclusions would apply in relation to a private sector service provider in the same circumstances;

- irrigators were or should have been aware, that irrigation charges could increase in the future. In this regard, while there was no clear statement from government that a rate of return would be charged, it was evident that governments were changing

their direction in respect to pricing towards more commercial pricing practices. Initially, such statements related to the Queensland Government seeking in excess of local costs of operation and maintenance, and more recently took the form of national agreements under COAG to include a rate of return, where practicable. The earlier advices were forwarded to grower representatives in December 1987 and again in October 1988. The first auction sales of land in the BRIA were undertaken in March 1988.

Cost of Capital

- (a) While there are a number of technical matters raised by SunWater in respect to the quantification of its cost of capital which will be the subject of further empirical study, these issues will not affect the key outcomes of this assessment; and
- (b) In the absence of any empirical work undertaken by ABARE or other relevant bodies on the complex issue of the cost of capital of irrigators, the Authority has considered a range of estimates of the cost of capital that could apply.

Return on Capital in Current Prices

- (a) Gazetted price paths for the Burdekin River Irrigation Area do not incorporate any excess return on capital when considered against the full commercial rate of return that could be incorporated into the price of providing those water infrastructure services; and
- (b) Notwithstanding this, it is quite possible for prices to not include a full commercial rate of return but at the same time to be in excess of growers' capacity to pay.

Appropriateness of a Positive Rate of Return

- (a) Prior to making an investment, commercialised or corporatised Government business undertakings such as SunWater should always seek to achieve a full commercial return from customers on any investments made, with any departure from this to facilitate public interest objectives to be funded explicitly by a CSO from the Queensland Government; and
- (b) After an investment has been made, whether it is appropriate to charge a positive rate of return will depend on consideration of a variety of factors. In particular, it may not be appropriate to charge a full commercial return (or any positive return depending on the circumstances) in the following situations:
 - when transitioning users to more commercial rates of return;
 - when contractual or legislative constraints exist;
 - during periods of substantial excess supply;
 - where there are redundant or over-engineered assets in the asset base;
 - where capital contributions should be recognised;
 - when differential prices would be possible but not appropriate;
 - when broader public interest matters determined by government are reflected in CSOs; and

- when market circumstances limit the capacity of users to pay.

Irrigators' Capacity to Pay

- (a) Under prevailing current and expected prices for sugar, sugarcane irrigators in the BRIA do not, on average, have a capacity to pay a positive rate of return on capital.
- (b) Within the current government policy requiring fixed price paths, it is not appropriate to automatically seek to reduce prices to accommodate a reduction in irrigators' capacity to pay from when the prices were initially set. In this regard, it must be recognized that capacity to pay is a two-sided coin and it is not appropriate to take it to account in a one-sided manner. The current approach sets prices for a period and those prices can not be varied upwards if capacity to pay improves. At the same time, it is noted that it is common for regulatory regimes to include a trigger mechanism under which a review of pricing would be initiated when certain defined circumstances materially change from those prevailing at the time that prices were initially set.

1.4 Formal Response to Ministerial Direction

With specific reference to the Ministerial Direction, the Authority has therefore concluded as follows:

- (a) capital contributions - payments by irrigators in excess of the costs of development were a capital contribution to the Scheme which should be taken into account for pricing purposes. After allowing for depreciation, these capital contributions totalled \$ 56.6 million within an optimised capital cost of \$ 257.2 million. Commonwealth and State Government payments were not capital contributions to the Scheme for pricing purposes;
- (b) WACC - the appropriate WACC for capital invested in water infrastructure to service BRIA was at least 8.27 per cent as at October 2000;
- (c) excess return on capital - based on the above estimates of cost and return on capital and accepting as given the current lower bound costs, current water prices do not incorporate any excess return on capital; and
- (d) positive rates of return - commercial service providers such as SunWater should always seek to achieve a full commercial rate of return on scheme assets prior to any investment being made. However, after an investment has been made, it may not be appropriate to charge a full commercial return (or any positive return depending on the circumstances) in the following situations: when transitioning users to more commercial rates of return; when contractual or legislative constraints exist; during periods of substantial excess supply; where there are redundant or over-engineered assets in the asset base; where capital contributions should be recognised; when differential prices would be possible but not appropriate; when broader public interest matters determined by government are reflected in CSOs; and when market circumstances limit the capacity of users to pay.

2. BACKGROUND

Summary

The Authority has been directed to assess a number of matters in relation to the services provided by SunWater to irrigators in the Burdekin River Irrigation Area within the Burdekin Haughton Supply Scheme. In particular, the Authority has been requested to determine the capital contributions made by various parties, estimate an appropriate weighted average cost of capital for pricing purposes and, determine whether current price paths incorporate any excess return on capital. The Authority has also been requested to advise the circumstances under which it would be appropriate for an entity to charge a positive rate of return on scheme assets.

The Burdekin Haughton Water Supply Scheme has supplied water to irrigators and other users in the Burdekin region, south of Townsville, since the 1950s. Scheme infrastructure includes the Burdekin Falls Dam, completed in 1987, a number of weirs on the Burdekin and Haughton Rivers, and three major distribution channel systems including pumping stations and a drainage network.

The Scheme supplies the Burdekin River Irrigation Area, the North and South Burdekin Water Boards and NQ Water.

Pricing policies for the Burdekin River Irrigation Area have varied over time and, while prices have increased in nominal terms, the price of water has been almost constant in real terms since 1980. Gazetted prices introduced in October 2000 generally continued the previous price level although the structure changed with the fixed charge increased and the volumetric charge lowered.

SunWater, the service provider for the Scheme, was corporatised on 1 October 2000 and is required to operate as a commercial entity. SunWater must also comply with the resource management requirements of the Water Act 2000 and a range of other resource management legislation.

2.1 The Authority's Remit

Ministers' Direction

On 17 January 2002, the Premier and the Treasurer (the Ministers), under section 10 (e) of the *Queensland Competition Authority Act 1997*, directed the Queensland Competition Authority (the Authority) to assess gazetted prices for channel and river irrigators receiving water infrastructure services (including harvesting, storage, distribution and reticulation) provided by SunWater within the Burdekin Haughton Water Supply Scheme (the Scheme) to:

1. Determine the capital contributions made by each, if any, of the irrigators, the Commonwealth, State governments or other parties. Such an assessment should consider:
 - (a) development costs associated with the Scheme;
 - (b) payments made for land, sugar cane assignments and water allocations (including consideration of the entitlements received for such payments);
 - (c) contributions by sugar mills; and
 - (d) any other relevant factors identified by the Authority, including any capital not accounted for by capital contributions.

2. Determine the appropriate weighted average cost of capital (WACC) that could be incorporated in the price of providing those water infrastructure services;
3. Determine whether the current price paths incorporate any excess return on capital based on the above analysis; and
4. Advise under what circumstances it would be appropriate for an entity to charge a positive rate of return on scheme assets.

For these purposes, the Ministers directed that the Authority should use:

- the valuation of assets established by Arthur Andersen in 2000 for the Queensland Government, or other valuation methods if deemed more appropriate, consistent with the sustainable provision of water services; and
- the lower bound costs² of the Scheme incorporated in gazetted price paths and the demand forecasts used in the rural water price setting process.

The Ministers stated that the Authority may exercise all the powers under Part 3 and Part 6 of the *Queensland Competition Authority Act 1997*, consult with all parties considered relevant to the investigation and issue public notices of the investigation.

The Ministerial Direction required the Authority to complete its assessment by 30 September 2002. However, as a result of delays in the receipt of stakeholder submissions, Ministers approved that the deadline be extended to 30 December 2002. The Authority also then sought, and was granted a further extension, to 31 March 2003 to allow all stakeholders a further opportunity for comment.

Other Matters

In making their Direction, the Ministers stated that the Authority's assessment was sought in the context of compliance with the pricing principles established by the Council of Australian Governments (COAG).

The Ministers noted that COAG pricing principles involve:

- the adoption of pricing regimes based on the principles of consumption-based pricing, full cost recovery and, desirably, the removal of cross-subsidies which are not consistent with efficient and effective service, use and provision;
- the progressive review of rural water charges and costs to ensure that most irrigation schemes comply with the principle of full cost recovery by no later than 2004; and
- the achievement of a positive real rate of return on the written down replacement cost of assets in rural water supply, where practicable.

The Ministers noted that the Standing Committee on Agriculture and Resource Management (SCARM) has developed cost recovery targets for all water users, to assist in the

² The Ministers' correspondence states that 'As reflected in the attached Terms of Reference, your investigation is of above lower bound pricing in the Burdekin Scheme. Lower bound pricing is to be used by the Authority as a given along with demand forecasts used in the rural water price setting process.'

implementation of full cost recovery under COAG pricing principles. The cost recovery targets were expressed in the form of upper and lower bounds for water prices.

Approach

In undertaking its remit, the Authority has:

- based its assessment on prices, asset values and information relevant to the time at which the gazetted prices were established, that is, October 2000. All references to dollar terms are reported on this basis unless otherwise specified;
- focussed upon water infrastructure services relevant to gazetted prices;
- established a framework against which the issues were to be considered;
- assessed submissions and information obtained from a range of agencies and sources against the framework established; and
- used independent experts to determine relevant cost estimates.

The Authority also undertook an extensive consultation process which included initial stakeholder submissions, a visit to stakeholders in the Burdekin area, the release of a Draft Report outlining the Authority's preliminary views, and two further rounds of stakeholder consultation, including the production and circulation of detailed comments by the Authority on the comments received from stakeholders on the Draft Report. Subsequent information identified by the Authority was also forwarded to potentially affected parties for comment.

In forming its views the Authority has necessarily relied upon available information.

All issues raised by stakeholders have been considered by the Authority. However, where the Authority has not addressed any particular issue raised by stakeholders, it is because the Authority considers that the issue:

- is addressed under the Authority's responses to other issues raised by the stakeholder; or
- is addressed in the Authority's response to other issues raised by other stakeholders; or
- is relevant to the assessment in a broader sense but would not affect the Authority's conclusions in relation to the specific questions posed in the Ministers' Direction; or
- is irrelevant to the current assessment.

The Authority's Final Report summarises the information that forms the basis of the Authority's assessment. Therefore, despite the requests of some stakeholders, the Authority does not propose to release documents or correspondence between the Authority or its officers and other persons in respect of the various issues reviewed.

Structure of the Report

The Report has been structured to respond to the key questions arising out of the Ministerial Direction as follows:

- whether payments made by nominated parties were capital contributions (Chapter 3);

- whether there is any capital unaccounted for by capital contributions (Chapter 4);
- what is the appropriate WACC (Chapter 5);
- whether current price paths incorporate any excess return on capital (Chapter 6);
- under what circumstances would it be appropriate for an entity to charge a positive rate of return on scheme assets (Chapter 7).

2.2 The Scheme

Geography and Infrastructure

Since its inception in the 1950s, the Burdekin Haughton Water Supply Scheme has supplied water to irrigators and other users in the Burdekin region, south of Townsville (Figure 1.1).

Whilst the bulk of the current Scheme infrastructure was constructed after 1980, some weirs and irrigation channels predate this time. Current Scheme infrastructure includes:

- the Burdekin Falls Dam, with a capacity of 1.86 million ML, completed in 1987;
- weirs on the Burdekin River (the Gorge, Blue Valley and Clare Weirs) and the Haughton River (the Giru and Val Bird Weirs);
- three major distribution channel systems, including pumping stations. These are the Haughton Main Channel, the Barratta Main Channel (both north and west of the Burdekin River) and the Elliot Main Channel (south and east of the Burdekin River);
- a 400 km subsidiary channelsystem to deliver irrigation water to individual farms in the Scheme; and
- a 350 km drainage network system to drain and remove excess water from individual farms to the natural drainage system.

For a period, water was also obtained from the Eungella Dam on the Broken River. However, this Dam is now allocated to other industrial, urban and agricultural users, and is separately administered under SunWater's Bowen Broken Rivers Water Supply Scheme.

Historical Background

The decision to construct the Burdekin Falls Dam and the bulk of the Scheme distribution infrastructure followed a number of investigations into the possible expansion of irrigation in the area. These investigations culminated in the 1980 *Report on Establishment of Burdekin River Project Undertaking*.³

The economic analysis contained within this report indicated that:

- the project was viable from a national economic impact perspective;
- the project was viable from a regional economic impact perspective; and

³ Queensland Water Resources Commission. 1980. *Report on Establishment of Burdekin River Project Undertaking*. Brisbane: Queensland Government Printer.

- farms would be commercially viable under then probable sugar prices and costs of production.

Under the assumption of a constant real price of water, it was expected that a 2.05% real return on the net capital cost of the Scheme would be achieved.

The stated objectives of the Scheme were to:

- provide additional water for existing cane production areas; and
- provide water for further agricultural, urban and industrial development and for likely increases in urban and industrial development to well beyond the year 2000.

It was also noted that the construction of the Burdekin Falls Dam would reduce flood damage in the developed areas below the dam.

Under the Scheme, the Queensland Government was to resume and subdivide farmland, build water infrastructure, sell farms and impose ongoing water charges. Funding sources were to include sales of land, land rents, sugar mill levies and water and drainage charges.

Total capital expenditure on the Scheme was estimated at \$580.8 million, with the Burdekin Falls Dam being the major item of expenditure (estimated at \$257.1 million). The 1980 report to Parliament estimated that the net capital cost of the Scheme, after accounting for revenues from land sales (which at that time included water entitlements), would be \$532.1 million.

In October 2000 dollar terms, actual capital expenditure on the Scheme was approximately \$587.0 million, largely in line with the original estimates. Expenditure on the Scheme net of revenues from land (and water entitlements) was \$482.7 million (see Tables B.1 and B.2 in Appendix B).

Since Parliament approved the Scheme in 1980, substantial changes to the original layout have occurred. The development of land proximate to the Elliot Channel did not proceed as planned due to poor soils and environmental problems while the development along the left bank of the Haughton River was greater than originally planned (Figure 1.1).

The Scheme was originally intended to service 660 farms over 56,760 hectares in the Burdekin River Irrigation Area (BRIA). However, due to changes in allowable farm sizes and the environmental problems noted above, water is currently provided to only 362 farms over 48,278 hectares in the BRIA. In addition, though, water is provided to the North and South Burdekin Water Boards which service 394 water users on 55,376 hectares.

The balance of the Scheme was to provide water for urban growth in Bowen and Townsville and for potential future projects such as hydroelectric power generation.

2.3 Legislative Framework

Overview

SunWater is the service provider for the Burdekin Haughton Water Supply Scheme. It was corporatised under the *Government Owned Corporations Act 1993 (GOC Act 1993)* on 1 October 2000.

The provisions of this Act, SunWater's Statement of Corporate Intent (SCI) and legislation relating to resource and operational management requirements specify that:

- SunWater is an autonomous corporatised entity;
- SunWater has its own Board of Directors (the Board);
- the Board is required to ensure that the activities of SunWater are managed in a commercial manner;
- the Board has the major responsibility for key decisions in relation to issues such as capital expenditure, borrowing and contractual arrangements;
- the Board is accountable to the shareholding Ministers, the Treasurer and the Minister for Natural Resources and Mines;
- dividends are negotiated annually between the Board and the shareholding Ministers. Since corporatisation, SunWater has paid no dividends; and
- SunWater must meet the requirements of all resource management and operational management legislative requirements.

However, while SunWater is required to operate as a commercial entity:

- price paths for rural water schemes are set externally by the Queensland Government; and
- where SunWater is required to price services below efficient operating, maintenance and administration costs, the shortfall is funded via an explicit community service obligation (CSO) from the Queensland Government. No CSO is paid in respect of the Burdekin Scheme as the relevant price paths are considered by the Queensland Government to exceed operating, maintenance and administration costs.

Statement of Corporate Intent (SCI)

Under the *GOC Act 1993*, the Board of SunWater is required to submit an annual SCI to shareholding Ministers. The SCI sets out a number of broad corporate governance requirements consistent with the *GOC Act 1993* as well as a number of specific powers and requirements such as:

- the requirement to honour contracts which State Water Projects (SWP) had in place prior to the corporatisation of SunWater;
- the requirement to recognise capital contributions. The SCI also raises the possibility that this may be the subject of a review by the Authority;
- the power for SunWater to sell water entitlements consistent with the terms and conditions set out in the Interim Resource Operations Licence (IROL) and eventually under a Resource Operations Licence (ROL); and
- the requirement to pay tax equivalents and actual local government rates.

Resource Management

The *Water Act 2000* is the key legislation relating to resource management issues for the Scheme. Under this Act, the 'use, flow and control' of all water in Queensland is vested in the State.

The Minister for Natural Resources and Mines is responsible for the allocation and sustainable management of water to meet Queensland's future water requirements, including water for the protection of natural ecosystems and the security of supply to water users.

These responsibilities are to be met through the preparation of a Water Resource Plan (WRP) for each catchment area which provides a framework for the sustainable allocation of water, including defining flows necessary to sustain water dependent ecosystems. The framework will define:

- water availability for the Scheme;
- priorities of water use within the Scheme;
- management strategies and monitoring requirements that will apply over the life of the WRP; and
- the basis for a framework that allows water allocations to be traded separately from land.

The WRP for the Burdekin Basin, a large catchment area that incorporates the Scheme, is currently being developed by the Department of Natural Resources and Mines (DNRM) in consultation with stakeholder groups. The Draft WRP is due for completion in December 2003 and, following appropriate community consultation, the Final WRP should be released around six months later.

Until the WRP is finalised, these functions are governed under an IROL. The current IROL essentially governs the same issues that the WRP being developed will govern.

Each irrigator in the Burdekin holds a water allocation with a stated volume. Under the *Water Act 2000*, the volume of water actually available to the irrigator under their allocation can be varied by announcement, depending on the volume of water actually available in the Burdekin Falls Dam (ie the irrigator can only receive water if there is sufficient supply).

In the Scheme, water allocations were obtained by individual irrigators through the sale of farms with attached water allocations, or through the explicit purchase of a water allocation when purchasing a farm. Some additional water allocations were granted free or purchased by existing farmers who were able to retain landholdings within the Scheme.

The *Water Act 2000* provides for titles to land and water to be legally separated and any water allocation held by an irrigator is then an economic asset in its own right, which can be subdivided, traded or sold, either temporarily or permanently.

The Queensland Government is currently developing administrative procedures (eg water allocation title registration and trading rules) to better facilitate the trading of water allocations.

In addition to resource management considerations contained in the *Water Act 2000*, the development and operation of the water infrastructure is subject to a variety of other State and Commonwealth legislation. At the State level, this includes the *Environmental Protection Act 1994*, the *Fisheries Act 1994*, the *Litter Act 1971*, the *Native Title Act 1993*, the *Nature Conservation Act 1992*, the *Soil Conservation Act 1986*, the *Queensland Heritage Act 1992* and the *Building Fire Safety Regulation 1991*. Commonwealth legislation includes the *Environmental Protection (Impact of Proposals) Act 1974*, the *Endangered Species Protection Act 1992* and the *Native Title Act 1993*.

Operational Management

In November 2000, SunWater was issued with an IROL which:

- provides a detailed description of all the water infrastructure to which the Licence applies, including the watercourses used for distribution and drainage;
- outlines the operating arrangements for water infrastructure, including arrangements designed to protect natural resources that may be adversely affected by the operation of the infrastructure, and arrangements to ensure safety standards are met;
- defines the terms relating to water management, such as water sharing rules, other water supply responsibilities and the apportionment of IWAs in accordance with the *Water Act 2000*. The IROL outlines the volumes of each allocation held by various users of the Scheme and the respective priority of each allocation, as well as stating that all unallocated water in the Scheme remains the property of SunWater; and
- provides a number of other general conditions under which irrigation services in the Scheme are licensed.

The *Water Act 2000* also requires providers to comply with other operational requirements such as:

- infrastructure standards. SunWater must have standards for continuity of service, pressure/flow conditions and other service level objectives, and must report on these in the form of a strategic asset management plan;
- customer service standards, including the type of water service, billing procedures and complaints procedures;
- dam safety standards, specifying dam operation and maintenance conditions, water release procedures and reporting and inspection requirements; and
- other requirements such as flood mitigation operations and planning.

2.4 Pricing

Since the inception of the Scheme, the relevant Minister has been responsible for setting prices and conditions for irrigation services in accordance with the relevant legislation.

Although comprehensive details of pricing policies are not available for the period prior to 1980, some information is available on earlier pricing practices:

- revenues from water charges were first reported in the Burdekin region after World War II. Water charges were set under the *Water Act 1926*, which stated that water charges should defray the cost of maintenance, repair, management, control and administration of works. However, the Act also stated that rates could be levied upon irrigation land in order to defray, in part or whole, 'principal monies and interest or rent or other payment' in respect of capital expenditure upon works. The basis for setting prices was not detailed;
- the levels of channel water charges for the Burdekin Irrigation Area were first reported in 1966-67 (Figure 2.1). In 1967-68, river water charges were also reported. Since their introduction, prices have steadily risen in nominal terms; and

- in real terms, channel and river water charges have varied over time, until the early 1980s when changes in prices became smoother (Figure 2.2). It appears that an estimate of the consumer price index (CPI) has been applied to prices on an annual basis since then.

After the development of the Burdekin Falls Dam and further irrigation channels, a variety of new charges were introduced. These charges reflected the expansion of irrigation services into new areas such as Giru and Horseshoe Lagoon, and policy decisions to charge for the use of groundwater and water diverted from drains.

From the time of their introduction, water charges were comprised of a two-part tariff, with a fixed ‘take or pay’ component that was payable regardless of the amount used. From the inception of the charges until 1997-98, the take or pay component was progressively increased from 50 to 75% of a farm’s water allocation. Additional water used was charged at the same per megalitre (ML) rate as the take or pay component.

In 1997-98, a fixed charge was applied to the full amount of water allocated to a particular farm, and a different variable charge applied to the actual water used by that farm. The fixed charge was payable regardless of the amount used. The impact of the tariff restructure on individual users depended upon their nominal allocation and usage patterns.

Gazetted prices introduced in October 2000 retained this two-part structure, although the fixed charge was increased and the variable component lowered. The new prices were designed to be revenue neutral initially and to decrease slightly over time to reflect the impact of envisaged additional demand on fixed costs.

Figures 2.1 and 2.2 below reflect the average delivery price of channel and river water in the Burdekin River Irrigation Area based on historic usage patterns.

Figure 2.1: Burdekin River Irrigation Area - Nominal Channel and River Prices

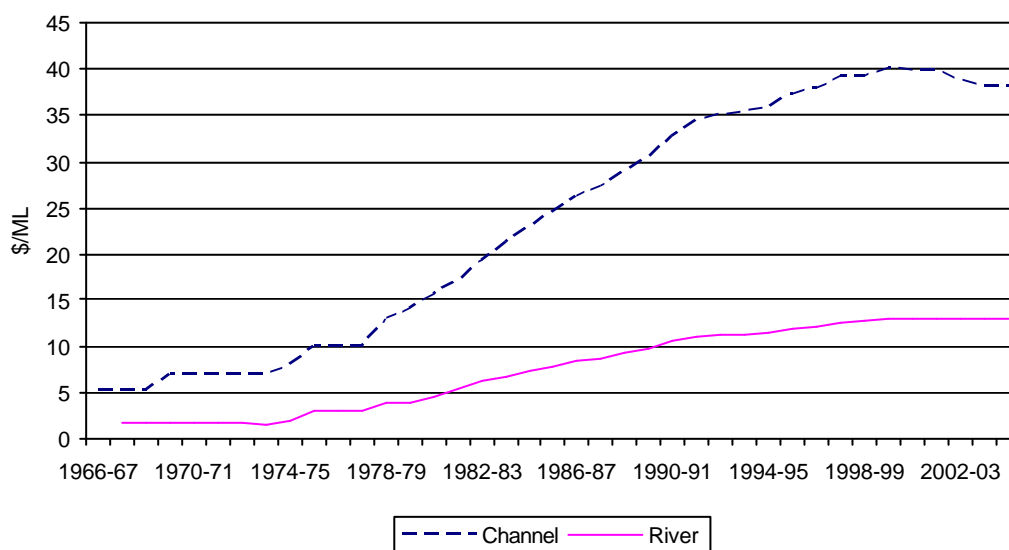
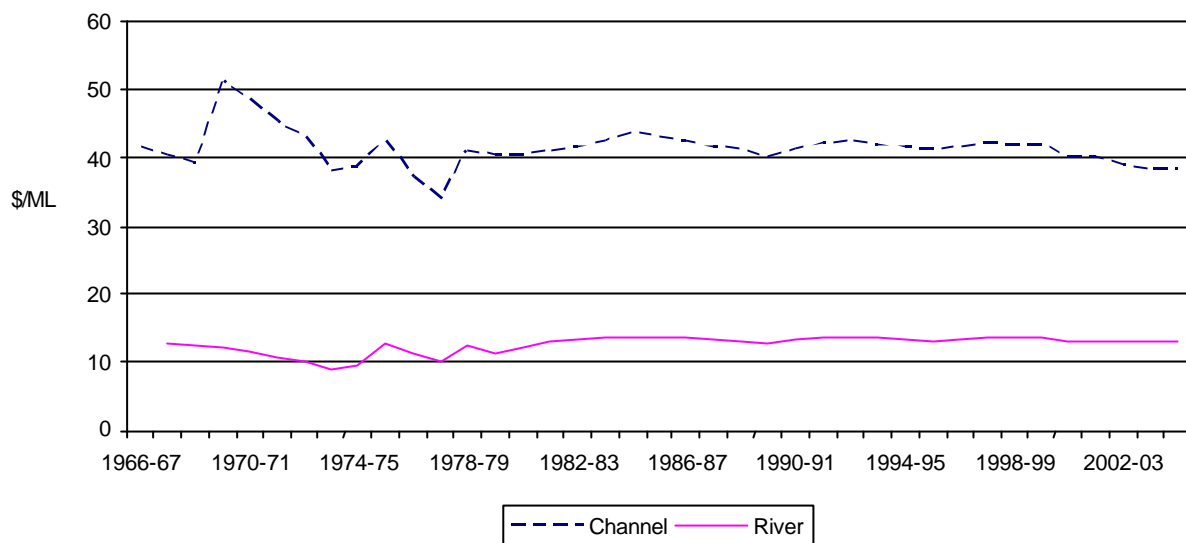


Figure 2.2: Burdekin River Irrigation Area– Real Channel and River Prices



3. CAPITAL CONTRIBUTIONS

Summary

The Ministers directed the Authority to determine the capital contributions made by each, if any, of the irrigators, the Commonwealth government, the State government or other parties.

Payments towards the capital cost of the Scheme were generally recognised as capital contributions where it was evident that the payment was made with the intention of obtaining future price benefits. Recognition was subject to the consideration of a number of other factors such as whether the contribution was a prepayment for future services or whether the asset had been replaced.

The Authority notes that there is no legal requirement for the Queensland Government to recognise any payments as capital contributions. However, the Authority concluded that the Scheme should be viewed as an integrated development with payments from many sources contributing towards its overall capital cost. Furthermore, available evidence indicates that there was an understanding within the Queensland Government and an expectation on behalf of irrigators that irrigators' payments for land, water and cane assignments were intended as an offset against the capital costs of the Scheme and that this would be taken into account in future price setting.

Accordingly, the Authority considers that payments for the land, water and cane assignments should be recognised as capital contributions. Prices should not include a return on these capital contributions as this would represent an unwarranted impost on growers.

With respect to the Commonwealth and State funding of the Scheme, available information indicates that the focus of the governments was on funding the Scheme and its perceived economic benefits. With respect to the Commonwealth Government's funding, the issue of pricing was left for the Queensland Government to determine. In accordance with the then current water pricing practices, the Queensland Government set prices at less than full cost. The Commonwealth was most likely aware of this situation and may well have supported the Queensland Government's approach. However, this is not the same as saying that the Commonwealth (or State) intended that, regardless of capacity to pay, no user, current or future, should ever have to pay a price for water which included a return on the funding provided by the Commonwealth (or State). Accordingly, these payments are not considered to be capital contributions which require recognition for pricing purposes.

While some irrigators may have inferred (or hoped) otherwise, from the press reports surrounding Townsville urban water pricing, there was no substantive basis for irrigators to form a reasonable expectation that their water prices would never incorporate any return on the Commonwealth funding.

The total value of capital contributions towards the Scheme is estimated at \$71.6 million.

3.1 Approach Adopted

In order to determine the capital contributions made in respect of the Burdekin River Irrigation Area, the Authority first considered the Scheme as a whole and the capital contributions made to it. This is the focus of this chapter. In chapter 4, these contributions are allocated as appropriate to the Burdekin River Irrigation Area, including an appropriate allocation of contributions to common assets.

3.2 General Principles

While there is no generally accepted definition of capital contribution, the Authority has taken the view that capital contributions are capital payments made towards the capital cost of an asset by a third party with the intention of reducing the capital outlay by the owner of the asset and with the expectation that the payment will be recognized for pricing purposes. Capital contributions may be made by prospective users and/or government.

Recognition of capital payments for pricing purposes has been proposed by stakeholders on the basis of:

- equity, in that users should not be required to pay a price that includes a return on capital for assets that have already been funded by them or by the government on their behalf; and
- economic efficiency, in that future investment could be discouraged if users who are required to make capital payments do not receive a benefit proportionate to their payments.

Once a payment has been determined to be a capital contribution, an approach to its recognition in pricing is required. In general, the options for doing so are:

- to exclude the capital contribution from the regulated asset base of the entity for the purposes of calculating prices; or
- to include the capital contribution in the regulated asset base, but adjust prices by a rebate to the user(s). The rebate would be equal to the return on capital for the capital contribution.

The COAG guidelines for water pricing require that the treatment of capital contributions in pricing is transparent.

Other Jurisdictions

The general principle that ‘double-charging’ should be avoided is recognised in the National Electricity Code (NEC) and the National Gas Code. It is also recognised in the Local Government Guidelines for Full Cost Pricing in Queensland.

In Tasmania, the Government Prices Oversight Commission (GPOC) has stated that capital contributions should be recognised in setting ongoing prices, and should be excluded from the relevant asset base for pricing purposes (GPOC 2001, p. 52).

Stakeholder Comment

The Burdekin River Irrigation Area Committee (BRIAC), the South Burdekin Water Board, the North Burdekin Water Board and Davco Farming separately submitted that a rate of return should not be charged on capital contributions.

SunWater stated that capital contributions should be recognised in lower prices where there is a legally binding and documented intent between the parties to provide future price benefits as a result of these payments.

In its response to the Authority’s Draft Report, BRIAC also submitted that:

-
- the Authority’s criteria for recognition of capital contributions should not require an expectation that the contribution will be recognised for pricing purposes; and
 - the quoted statements from official sources in the Draft Report state or imply that capital contributions for water works were to be the only contributions in relation to capital sought from irrigators.

The Australian Sugar Milling Council (ASMC) submitted that:

- it was not necessary to establish that the parties had an intention and reasonable expectation that the capital payment would be recognised for pricing purposes as the Authority is not determining the legal rights of contributors;
- payments should be recognised as capital contributions where contributions were made and these contributions have not been otherwise recognised;
- if the Authority maintains that an intention and expectation is required, the Authority should provide more specific information about how this intention should be shown, particularly where no formal agreement is in place; and
- in order to achieve some consistency and certainty, it is appropriate for the Authority to articulate some definitive, generally applicable principles regarding capital contributions.

The Proserpine Irrigators Committee noted that references to capital contributions in correspondence sent by the Queensland Government in relation to the Proserpine Scheme were non-specific and subject to alternative interpretations.

SunWater submitted that:

- documentation should clearly indicate a pricing intention before payments are recognised as capital contributions;
- payments should not be treated as capital contributions where they were paid in order to purchase an asset or other right; and
- the “capital contributions” must be dealt with in terms of Government policy in relation to water pricing which was clearly articulated through the commitment to the COAG and NCP reform.

QCA Analysis

As a general principle, capital payments should be regarded as capital contributions (and thus reflected in the prices paid by users of the asset) if it was the intention and expectation of the relevant parties at the time that the capital payment would be recognized for pricing purposes. However, in a pricing review or determination, recognition of past capital contributions in future prices would not be appropriate if:

- past price reductions have fully compensated the contributor for the contribution⁴; or
- the asset towards which the contribution was made has been consumed.

⁴ As outlined in 3.11 below, this general proposition is subject to consideration of the circumstances surrounding any such price reductions.

In addition, not all payments made by users are of a capital nature. For example, payments made as a prepayment for future services are not capital contributions.

Therefore, consideration must be given to the particular circumstances surrounding any payments made by users and/or government.

In some instances, a formal agreement will be in place which outlines the manner in which a payment is to be treated.

However, in other instances, formal agreements attesting to the quantum of a payment, its nature or its purpose are not available or there may be a lack of clarity regarding any arrangements. In these circumstances, a judgement must be made on the basis of all available evidence.

In summary, the Authority considers that a capital payment should be regarded as a capital contribution if it was the intention and expectation of the relevant parties at the time that the capital payment would be recognized for pricing purposes. Furthermore, a capital contribution should be recognized for pricing purposes unless past price reductions have fully compensated the contributor for the contribution or the asset towards which the contribution was made has been consumed⁵.

The Authority also recommends that, once recognised, capital contributions should be included in the capital base for the purpose of determining prices, with rebates incorporated in the prices for relevant user(s) equivalent to the return on capital.

In response to the BRIAC's comments on the Draft Report, the Authority considers that:

- the intentions and expectations of the parties at the time a payment is made are crucial to determining whether a payment by a particular party is a capital contribution or intended for another purpose.

The multi-faceted nature of government is such that it will from time to time provide funds for projects for a variety of alternative purposes. In some instances, funds may be provided purely for financing purposes. In others, the funds may be intended to produce benefits for different groups within the community (not only for customers). It therefore cannot be assumed that all government payments are intended to reduce prices to customers.

Similarly, payments made by customers to a service provider could represent a prepayment for services, or even a donation. Accordingly, it can not be assumed that all up-front payments from customers are intended to be a capital contribution; and

- while the Authority has recognised that revenues from the sale of land and water allocations are a capital contribution to the cost of the Scheme, the evidence quoted by BRIAC does not support the proposition that no other capital contributions or payments for capital would be sought.

In respect of ASMC's comments:

⁵ As outlined in 3.11 below, this general proposition is subject to consideration of the circumstances surrounding any such price reductions.

- the intentions and expectations of stakeholders affect their investment and consumption decisions and are thus relevant to pricing;
- as noted above, there are a range of other possible objectives of capital payments;
- as far as the appropriate evidence to demonstrate the intentions of the parties is concerned, a formal agreement between the parties would probably provide the clearest evidence.

Without a formal agreement, a judgement as to the intentions of the parties must be made on the basis of all available evidence. Consistent documentary evidence from relevant parties at the time the payments were made may lend weight to a particular interpretation. However, the Authority cannot be prescriptive as to the nature of this evidence, as it needs to consider each issue on its merits. It is a question of the facts of each case; and

- the Authority’s report is necessarily limited to the matters specifically raised in the Ministers’ Direction. The development of general guidelines is neither possible nor appropriate. The Authority must not prejudge any matters that come before it and therefore must deal with each on its merits.

The Authority does not consider that the material sent to the Proserpine irrigators is relevant to this assessment.

In respect of SunWater’s submission on the Draft Report, no new matters were raised to cause the Authority to change its considered position in respect of the treatment of payments paid to purchase an asset or other right.

Further, COAG has no specific requirements relating to capital contributions, and pricing for rural water is ‘to achieve a positive real rate of return on the written-down replacement costs of assets in rural water supply by 2001, wherever practicable’. The only reference is in guide lines which arose from the Report of an Expert Group reporting to COAG and these recommended that contributed assets be transparent. There is thus no prescribed method for addressing capital contributions under COAG or NCP.

3.3 The Burdekin Haughton Water Supply Scheme

The Burdekin Haughton Water Supply Scheme involved the development of both land and water infrastructure. Farms were resumed, subdivided and redeveloped, and road and water infrastructure built.

A variety of payments were received, including:

- headworks contributions from existing farmers who chose to retain land in the Scheme;
- auction payments for land and water allocations (which incorporated payments for dry land and improvements such as clearing and fencing, water allocations, stamp duty, electricity connection, sugar cane assignments and access to Scheme infrastructure);
- payments by irrigators for meters and a portion of the costs of an upgrade of the Barratta Main Channel; and
- sugar mill levies.

Both Commonwealth and State Government funding was also provided.

In determining which payments are relevant to the assessment of capital contributions for gazetted pricing purposes, it is particularly necessary to consider whether the Scheme:

- was intended to be an integrated land and water development project, with revenue from all sources offsetting the capital costs of the Scheme; or
- should be viewed as a series of discrete but complementary activities where each revenue source should be considered only in relation to its capital expenditure (for example, the land revenues would only relate to land development expenditures).

Stakeholder Comment

BRIAC contended that the Scheme should be viewed as an integrated land and water development project, in which all economic returns from the Scheme should be taken into account, including land and water allocation sales.

SunWater submitted that the land and water developments should be viewed separately as revenues from the sale of land accrued to the Lands Department and did not flow to the predecessors of SunWater.

SunWater also submitted that the cost of the general access road network servicing farms was essentially part of the land development and subdivision of farms, and should be viewed as an expense in that context to be offset against proceeds from the sale of land in the Scheme.

Furthermore, SunWater submitted that the 1980 report to Parliament should not be used in determining future water charges, stating that the report:

... was prepared solely for the purposes of providing the necessary information required by the Irrigation Act to be considered by the Parliament in establishing the irrigation undertaking. The 1980 report was not prepared for any other purpose. It has no force of law and does not purport to determine the basis for the future charging of water services.

QCA Analysis

The 1980 report to Parliament was prepared for the purpose of providing the necessary information required by the Irrigation Act to be considered by the Parliament in establishing the irrigation undertaking. It contains the detailed proposals for the development of the Burdekin Scheme, which Parliament approved on 18 March 1980.

The Authority notes that, whilst the 1980 report may not be legally binding on Government, it does give an insight into the manner in which the Government proposed to fund the Scheme.

In this report, revenues from the sale of land (which at that time included a water entitlement) were offset against the total estimated capital costs of the overall Scheme. That is, the Burdekin Scheme was treated as an integrated Government land and water development project.

Furthermore, it is noted that the Water Resources Commission (WRC) (a predecessor of SunWater and the Department of Natural Resources and Mines) had the responsibility for the development of both the land and water infrastructure. In this role, the Commission:

- advised irrigators of the arrangements affecting both land and water;

- kept combined accounts for land and water development purposes (and recorded this in its annual reports), which included land resumption costs as well as water infrastructure development costs;
- entered into contracts with the local Councils regarding the construction and upgrading of roads; and
- organised the subsequent auctions of farms and the sale of water allocations.

It is also noted that revenues from the sale of land were included in an analysis of the further development of the Scheme, which stated that ‘The full repayment for land sold is included in the analysis as an input to the State, although all repayments after the initial deposit are collected by the Department of Lands. This is an important point to note when considering any annual balance sheet for the WRC’s activities in the project.’⁶

Furthermore, the auction value of land represented the total value that irrigators placed upon all entitlements associated with it.

The Authority also notes that general access roads which were specifically constructed for the purposes of the Scheme would not in the main have been developed without it and the Authority accepts these as a specific cost to the Scheme. However, some of the costs of these roads were met by the Burdekin Shire Council as they were regarded as falling within their normal responsibilities and the relevant amount (\$1.9 million) has been excluded from the cost of the Scheme for pricing purposes.

3.4 Retention Farms (Headworks Contribution)

Land in the Burdekin basin was resumed and subdivided into smaller holdings as part of the development accompanying the construction of the Burdekin Dam. The resumption value of the land reflected its previous use - grazing land, dry arable land or irrigable land.

Prior landholders were allowed to retain up to a 100 hectare parcel and up to seven additional farms at resumption value. All farms were granted a water allocation of eight ML per hectare, where this was not already available. SunWater has advised that, under the prevailing arrangements at that time, the licences which provided for the water entitlement or nominal allocation always remained subject to cancellation or suspension in accordance with the provisions of the legislation. Further, the licences were issued for a specific period.

Prior to December 1989, a headworks contribution charge was payable in relation to the additional farms purchased by existing landholders (it did not apply to the initial 100 hectare farm held). For channel irrigators, the headworks contribution was \$1,800 per hectare for additional farms that were intended for sugar production and \$1,100 per hectare for those intended for rice production. For riparian (river) irrigators who wished to develop their own land by private diversion, the headworks contribution was \$100 per ML of water allocation above 800 ML (or pre-existing allocation, if larger).

From December 1989, the fixed headworks contributions charge for channel irrigators was abolished. Additional channel farms could be purchased at market values, recognising the value added by the development works.

⁶ Queensland Department of Primary Industries, 1990, p. 32.

The records available to the Authority indicate that no revenues were received through the headworks contribution charge prior to 1989. However, SunWater has estimated that \$9.4 million was received by the Queensland Government from retention farms after 1989.

Stakeholder Comment

BRIAC submitted that the headworks contribution charge was a capital contribution, on the basis of the representations made to BRIA irrigators by Queensland Government representatives.⁷ BRIAC submitted that these representations are legally binding and require SunWater to now recognise these payments as capital contributions.

SunWater submitted that the headworks contribution should not be viewed as a capital contribution as there was no documented or implied intent to provide future price benefits from this payment. SunWater also submitted that, if the Government had intended to provide future price benefits as a result of these payments, then lower annual water prices would apply to those people who had paid for water allocations, and higher prices would apply to those who had water allocations granted free of charge. SunWater noted that current prices do not differentiate between users on this basis.

SunWater further submitted that the headworks contribution charge was a payment for water allocations and this asset has value in its own right and that to provide future price benefits in water delivery charges would represent a form of ‘double dipping’ with irrigators receiving an asset and lower delivered water prices.

SunWater also submitted that there is no legal constraint on future water charges arising from any documentation provided to the irrigators. In particular, SunWater submitted that the setting of water charges was, and is, not bound by any statements passing between the employees of the State and irrigators which indicated that payments were intended to be recognised as a capital contribution.

QCA Analysis

The Authority notes that various documents stated that the headworks contribution charge:

- was based on ‘recognition of the works provided’ and that the future level of the charges ‘will be reconsidered in light of then current Project costs’;⁸
- was a mechanism for ‘capital cost recovery from retention farm holders’ that would influence ‘the cash requirements for the project in the short term’;⁹
- was based on ‘recovering as much as possible of the huge capital cost of the project from those who will benefit directly from it’;¹⁰ and

⁷ Correspondence from the Secretary of the Queensland Water Resources Commission, to Burdekin landholders in 1982; and correspondence from the Commissioner of Water Resources to an irrigator, dated 26 March 1987.

⁸ Correspondence from the Secretary of the Queensland Water Resources Commission to Burdekin landholders in 1982.

⁹ Memorandum from the Water Resources Commissioner to the Minister for Water Resources and Maritime Services, 3 May 1984.

¹⁰ Press Release from Senator P. Walsh, Commonwealth Minister for Resources and Energy, Canberra, 26 April 1984.

- was a ‘once-off capital contribution’.¹¹

These statements indicate that the headworks contribution was intended as an offset against the capital costs of the Scheme. However, this does not preclude the imposition of charges to reflect any remaining capital costs of the Scheme.

BRIAC’s contention that there is a legally binding obligation for the payments to be recognised as capital contributions is not supported by the Authority’s legal advice. That advice indicates that such representations do not legally bind future water prices and, in particular, do not legally require that the payments be recognised as capital contributions to the Scheme. At the same time, they do not prohibit the recognition of these representations.

In respect of the SunWater submissions, it is considered that:

- the absence of differentiated prices does not provide a basis for concluding that contributions were not to be regarded as an offset to future prices. Individual users are often not compensated for their specific contributions due to administrative and compliance costs and recognition can involve averaging of contributions across more easily identifiable user groups; and
- the receipt of a lower price of water (as a result of the recognition of the headworks contribution) and an asset (the water allocation) does not constitute double dipping in benefits by irrigators. While the Authority accepts SunWater’s view that the water entitlement is an asset, as it represents a right to use water, it is noted that there are many instances where capital assets are sold as a means of financing a development. Having paid for the water entitlement, irrigators (like any other asset holder) are entitled to future gains or losses according to the terms on which the asset is held and outcomes in the market.

Having regard to the available documentation and representations made in the past to irrigators, the Authority considers that relevant agencies intended, and irrigators had a reasonable expectation to believe, that the headworks contributions were to be regarded as a capital contribution.

3.5 Auction Sales

Land purchased at auction incorporated a composite set of entitlements, including dry land and improvements such as clearing and fencing, sugar cane assignment, water allocations, stamp duty (on land sales), electricity connection and access to Scheme infrastructure. Separate payments to the WRC were required for improvements and water allocation. Stamp duty was due to the Queensland Government and electricity connection payments were due to NORQEB.

A sugar cane assignment incorporated the right to sell cane to the local sugar mill at regulated prices. Cane assignments were provided with many blocks sold at auction and, where not attached, were made available at no extra cost, upon application, usually within a twelve month period.

Water entitlements were attached to the land purchased at auction prior to March 1993. After March 1993, a separate payment related to the water allocations. This payment, at \$250 per ML for channel irrigators and \$100 per ML for river irrigators, has been in place without variation since that time.

¹¹ Correspondence from the Commissioner of Water Resources to Burdekin landholders, December 1989.

Most auction sales achieved above the reserve price set by the Queensland Government. Some earlier farm auctions only achieved around the reserve price because of concerns regarding their viability. This also occurred in later auctions as a result of declining sugar prices and also because of rising reserve prices based on previous sales.

The Queensland Government also provided preferential finance arrangements to irrigators for land and for water allocations. Land was financed over ten years with payments made in ten annual instalments. The first payment was capitalized over the balance of the term. Payments in each subsequent year were equal to the principal then due (total outstanding divided by the balance of the term) plus the interest for the amount due in that year (but not on the balance of funds outstanding). In other words, a benefit was derived equal to the interest that would normally accrue on the balance outstanding. A similar arrangement was applied to water allocations although they were calculated on a quarterly basis.

Stakeholder Comment

BRIAC submitted that land and water allocation revenues were capital contributions to the Scheme, on the basis of Government statements.¹² BRIAC submitted that nothing was paid for sugar cane assignments as these were freely available at the time from the Queensland Sugar Corporation on recommendation by the representative CANEGROWER bodies. Submissions were also received stating that cane assignments issued after the auction resulted in lower payments for cane as:

- a \$1 per tonne infrastructure levy was payable to the mill;
- no continuous crushing allowance was available, worth up to 47 cents per tonne; and
- no season extension allowance was available, worth 60 cents per tonne.

The South Burdekin Water Board submitted that water allocation payments were a capital contribution on the basis of prior written statements made by representatives of the Queensland Government.¹³

The Burdekin Shire Council noted that the Government made a substantial net return on the sale of land in the Scheme, estimating that realised prices totalled \$67 million above upset prices of \$25.2 million at auction, and argued that these should be taken into account in establishing appropriate cost levels.

Davco Farming submitted that irrigators had paid a total of \$143.5 million in nominal terms in capital contributions towards the Scheme, comprised of:

- net returns to Government on the sale of land and water allocations of \$75.3 million, encompassing total payments made by irrigators for land and water allocations less the resumption costs to Government and the costs involved in selling the land (including legals and selling agents fees);
- interest paid on Government loans of \$29.1 million; and

¹² Queensland Government supplementary submission to the Industry Commission Inquiry into Water Resources and Waste Water Disposal, January 1992, pp. 5, 7.

¹³ Department of Primary Industries (Water Resources) 1993, *Purchasing water allocation*, Brochure; Department of Primary Industries 1993, *Draft Interim Policy Document Burdekin River Irrigation Area Future Water Management*, Discussion Paper for Public Consultation; and correspondence from the Area Manager, State Water Projects, Ayr to the Manager, South Burdekin Water Board, 7 July 1997.

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- annual water infrastructure charges in excess of local management operation and management costs of \$3.9 million.

SunWater submitted that payments for land and water allocations are not capital contributions as there was no documented or implied intent for any particular set of water charges to apply beyond the year in which the farms were purchased. As noted above, SunWater also submitted that:

if the Government had intended to provide future price benefits as a result of these payments, then differential water charging arrangements would apply. SunWater noted that current prices do not differentiate between users; and

- payments for land as well as water allocations represented a commercial purchase of tradeable assets. To provide future price benefits to users as a result of this payment would result in an additional benefit to irrigators that was not intended at the time of the initial transaction.

Similarly, DNRM stated that it did not view revenues from the sale of land and water allocations as capital contributions but as payments for assets which have value and can be sold by the purchaser.

In response to the Authority's Draft Report, BRIAC submitted that, if the cost of building roads was an expense to be offset against land sales, so too was the irrigation scheme itself and there should be no amount treated as capital expenditure for pricing purposes.

QCA Analysis

Land Revenue

As noted above, the Authority considers that, given the integrated nature of the Scheme, any surplus received from the auction of land represents a capital contribution to the Scheme.

This view is supported by:

- the treatment of revenues from land sales in the 1980 report to Parliament, in which revenues from land sales were offset against the estimated capital cost of the Scheme;
- the Queensland Government's submission to the Industry Commission Inquiry into Water Resources and Waste Water disposal in 1991 which noted that 'the sale of those farms sold at auction raised some funds towards the capital cost of the schemes where such a system operated. Current policy in the BRIA, and other areas under development, is to dispose of all farms by auction';¹⁴ and
- a 1993 water pricing policy options paper which noted that, in general, 'Those users who have paid a capital charge for their water allocation, either directly or through the purchase of a land and water package, can claim to have paid a proportion of the capital cost of the assets already'.¹⁵

¹⁴ Queensland Government submission to the Industry Commission Inquiry into Water Resources and Waste Water Disposal, September 1991, p. 55.

¹⁵ Queensland Department of Primary Industries 1993, *What Price Water?* Discussion Paper, p. 36.

In respect of the SunWater and DNRM submissions, the Authority does not consider that differential payments are relevant nor that irrigators would receive a double benefit as a result of recognition of the payments as capital contributions, for reasons identified in an earlier section.

The Authority has estimated that the Queensland Government made a net return from the sale of land at auction of \$29.3 million in October 2000 terms, after accounting for the costs of resumption, the costs of providing roads and preferential finance to growers. This is lower than the Davco Farming estimate of net returns as the Authority has not included revenues from interest paid to Government in respect of land and water allocation sales, has dealt with water allocation payments separately (see below), has been required to accept lower bound costs and thus has not introduced any adjustment to operating and management costs as suggested by Davco Farming, and has included the costs of providing roads in the costs of the Scheme.

In response to BRIAC's submission on the Draft Report, revenues received from land sales were not sufficient to offset the full cost of the integrated land and water development. That is, there is some capital not covered by irrigators' contributions. This is addressed in Chapter 4.

Sugar Cane Assignments

The sugar cane assignment system operated in Queensland from 1915 to 1997, when it was replaced by the current Cane Production Area system. The assignment system regulated who grew cane, how much was grown and the location of production.

Under the assignment scheme, prices were paid to growers under two separate pools. A mill's entitlement to receive the Pool 1 price was called the 'mill peak' and was specified in tonnes of raw sugar. Raw sugar produced in excess of the mill peak received the Pool 2 price, which reflected the spot price for sugar. Sugar produced from cane grown on unassigned land was classified as penalty sugar and, if delivered, would generally receive a penalty price. As from 1997, only one average price has applied.

Cane assignment had the effect of assuring the grower that the local mill would buy the complete harvest from the land with assignment, and it also assured the local mill that it would have a secure supply of sugar cane.

During the period of the Scheme development and the sale of land at auction, a number of significant changes were made to the assignment system including:

- the introduction of 'roaming' which allowed growers to use up to 15% of their granted assignment on any land within the mill area. This in effect removed part of the restriction of tying assignment to a specific parcel of land; and
- the introduction of the *Sugar Industry Act 1991*, which made it possible to transfer 100% of assignment within a mill area.

To the extent that there was a constraint on the availability of assignment, this would be reflected in the price paid for land.

The key restriction in the availability of cane assignments was the capacity constraint of the local mills to process the sugar cane. As milling capacity increases, a corresponding increase in cane assignment also occurs. BRIA is served by the Invicta, Pioneer and Inkerman Mill areas, with the majority of the farms supplying the Invicta Mill.

Concurrently with the development and sale of land in the BRIA, there was a significant and continuous increase in the availability of cane assignment due to:

- a substantial effective increase in the milling capacity in the region as mills moved from crushing five to seven days a week. The Invicta Mill shifted to continuous crushing in 1988, while the Pioneer and Inkerman Mills moved to continuous crushing in the 1990s; and
- actual augmentation of the milling infrastructure. During the period of the Scheme's development, approximately \$200 million has been invested in a significant expansion of the Invicta Mill, with the result that the mill has moved from being one of the smallest in the State to being one of the largest.

In the Invicta Mill area, the mill processing the bulk of BRIA sugar, production increased 2.9 times and cane assignments increased 3.1 times over the same period.

The data indicates that surplus mill capacity and cane assignments are a feature of the Scheme, although the Authority understands that some short term shortages did exist for some period in its development.

In 1991, Davco Farming, in a submission to the Industry Commission, estimated that cane assignments in the Burdekin were worth about \$1000 per hectare (IC 1992, p. 49). Applying this value across all of the land sold to that time, and assuming that all of this land was granted assignment, this factor accounts for \$6.3 million of the total auction returns to that date of \$16.2 million. However, the basis for this claim by Davco Farming was never examined by the Industry Commission. By 1992, the value of assignment was estimated at between \$100 and \$400 per hectare due to increased availability in assignment and continuing low sugar prices.

Based on the evidence available, any value for assignment is likely to be low and, in any case, will be captured in the price bid for land in the Scheme. As such, separate consideration of the treatment of cane assignments is not required.

Water Allocations

A water allocation was described in the auction literature as 'the farm's entitlement to a volume of water and represents the share in the water available from Burdekin Falls Dam or groundwater supplies. It secures the farm's water supply so it can be irrigated.'

The following material has been identified which is supportive of the contention that revenues from the sale of water allocations were to be recognised as capital contributions:

- the treatment of revenues from land sales (which at that time included water entitlements) in the 1980 report to Parliament, in which revenues from land sales were offset against the estimated capital cost of the Scheme;
- a media release from the Minister for Primary Industries in April 1990 which, in announcing the introduction of water allocation charges, referred to these as a 'capital charge' which 'should represent a substantial contribution to the cost of providing supply from the storage and distribution system';¹⁶

¹⁶ Media Release from the Office of the Minister for Primary Industries, *Sale of Water Allocations*, 3 April 1990.

- correspondence from the WRC in 1990 to an individual irrigator which referred to water allocation payments as ‘contributions that would be required to the capital cost of water supply and other works provided ... by the State’;¹⁷
- the Queensland Government’s submissions to the Industry Commission Inquiry into Water Resources and Waste Water disposal in 1992, which referred to the ‘\$100 per ML capital contribution for riparian irrigators’¹⁸ as a ‘once-off capital contribution of \$100/megalitre’. The \$100 per ML charge was for the purchase of water allocations from the river;
- statements in a brochure published by the Department of Primary Industries in 1993 that the capital charge for water allocations ‘allows part of the capital cost of the scheme to be repaid to the taxpayer’;¹⁹
- a 1993 discussion paper which stated that allocation charges were ‘capital charges’ structured to reflect, amongst other things, ‘the cost of developing on-farm systems and capital cost of supply’;²⁰
- correspondence from SWP in 1997 to the South Burdekin Water Board, relating to the potential purchase of water by the Board, which refers to the purchase of allocation as ‘A once all payment at the Capital Charge rate at the time of purchase. The rate for the water from the river at this present time is \$100/ML’²¹; and
- a Queensland Government letter to the National Competition Council (NCC) in 1999 which indicates that revenues from the sale of water allocations in another Scheme - the Bedford Weir Stage II project - were used to offset the capital costs of the project in order to prove economic viability.²²

However, this does not preclude the imposition of charges to reflect any remaining capital costs of the Scheme.

The Queensland Government received \$26.3 million from the sale of water allocations with auctioned land. After taking into account the cost of providing preferential finance to growers, the net return to Government at auction was \$17.4 million. An additional \$13.3 million was received through sales of water allocations outside of the auction process.

After consideration of all the issues, the Authority considers that these amounts represent capital contributions to the Scheme.

3.6 Meters and Barratta Main Channel Upgrade

SunWater has advised the Authority that irrigators have contributed \$2.1 million to the Scheme to fund the upgrade of the Barratta Main Channel and for metered outlets.

¹⁷ Correspondence dated 10 January 1990, from the Regional Engineer, Northern Region, Water Resources Commission, to an irrigator.

¹⁸ Queensland Government supplementary submission to the Industry Commission Inquiry into Water Resources and Waste Water Disposal, January 1992, pp. 5, 7.

¹⁹ Queensland Department of Primary Industries (Water Resources) 1993, *Purchasing water allocation*, Brochure.

²⁰ Queensland Department of Primary Industries 1993, *Burdekin River Irrigation Area Future Water Management*, Discussion Paper for Public Consultation.

²¹ Correspondence from the Area Manager, State Water Projects, Ayr to the Manager, South Burdekin Water Board, 7 July 1997.

²² Letter from the Queensland Government to the NCC, 14 September 1999 (referenced in BRIA sub. 1., p.100).

BRIAC has argued that these funds form a capital contribution to the Scheme.

The Authority accepts that these payments represent capital contributions to the Scheme.

BRIAC has also advised that new water meters recently installed by SunWater are indicating higher rates of consumption than indicated by older meters. This discrepancy, if it were confirmed, works in the irrigators' favour in the Authority's current assessment as, if demand is in reality higher, the allocations of water, and correspondingly the share of costs, would increase. However, as confirmation of the failure of the old meters to accurately measure usage on a systematic basis is yet to be established, this issue is left for resolution between SunWater and irrigators over the longer term.

3.7 Sugar Mill Levies

From 1982-83 to 1998-99, sugar mills were charged an annual levy towards the Scheme in recognition of the benefits received by the mills as a result of the increased supply of water to sugar cane irrigators. The levy was charged on the basis of the amount of sugar cane produced under the Pool 1 pricing arrangements.

Sugar mills in the Burdekin region paid the levy on a relatively small proportion of sugar cane under production, as most of the sugar in the Burdekin was grown under the Pool 2 pricing arrangements.

Sugar mill levies were abolished in 1998-99. The price of water in the Burdekin Scheme was increased in the following year to recover a portion of the lost revenues.

The sugar mills paid approximately \$10.7 million in levies towards the Scheme over the period since 1982-83.

Stakeholder Comment

BRIAC argued that revenues received through sugar mill levies were a capital contribution to the Scheme.

In response to the Draft Report, BRIAC also claimed that the 1989 Federal Court decision had been misconstrued by the Authority, and asserted that the Court was looking at the deductibility of a levy against income, not whether the entity receiving the levy was using it to defray capital costs. BRIAC argued that a payment by one person may be a deductible, recurrent expenditure yet still be used by the recipient for capital purposes.

SunWater has submitted that, in paying the levies, sugar mills were not given any expectation that they would receive lower water prices. No price offset was incorporated into prices for mills that paid the levy.

Furthermore, SunWater submitted that there is no evidence of any commitment to set lower charges for landholders producing cane under the Pool 1 arrangement. SunWater stated that, if the levy had been intended as a capital contribution, a differential pricing regime would have been established between:

- landholders growing cane under the Pool 1 pricing arrangement;
- landholders growing cane under other pricing arrangements; and
- landholders growing crops other than cane.

QCA Analysis

As noted previously, the Authority does not consider that the absence of differentiated prices provides a basis for concluding that contributions were not to be regarded as an offset to future prices. However:

- the 1980 Parliamentary report did not envisage sugar mill levies as a capital contribution. Unlike revenues from land sales, the report did not offset sugar mill levy revenues against the capital costs of the Burdekin Scheme. The revenues from sugar mill levies were treated similarly to revenues accrued from water prices, which were set against operating and maintenance costs in order to determine the likely return on capital;
- the legislation under which the sugar mill levy was imposed does not indicate that the levy was to be offset against future prices. The *Sugar Mill Assessment Regulation 1977* stated that the levy was ‘a payment towards the operation maintenance or administration costs with respect to such supply of water.’ The *Water Resources Act 1989*, which became the relevant legislative authority in 1991, stated that the levy ‘must be applied towards the cost of operation, maintenance or administration and as a contribution towards capital costs with respect to the supply of water to or the drainage of land’; and
- the nature of a particular sugar mill levy in the Houghton River region of the Burdekin was considered by the Federal Court of Australia, which concluded that the levy was properly accounted for under ‘revenue rather than capital account’.²³ In that case, levies were used to fund the interest paid on borrowings for construction of a weir. The Court stated that that the levies ‘form part of the ordinary or constant demands which must be answered out of the returns of the trade of a cane grower, just like rates, water levies and the like and are rather of the character of recurrent expenditure than expenditure made once and for all for the purpose of obtaining an advantage of an enduring nature.’

Having regard to the recurrent nature of the levy, in its Draft Report the Authority concurred with the Federal Court’s interpretation and considered that sugar mill levies did not represent capital contributions towards the Scheme.

In response to comments by BRIAC on the Draft Report, the Authority agrees that a payment may be deductible recurrent expenditure but still be used for capital purposes. However, the Authority considers that its assessment of the Court’s decision is still appropriate. In other words the levy was not capital in nature and is not a capital contribution.

The Authority has also discussed this matter with the Mareeba Dimbula Customer Council, Canegrowers, the Bundaberg Mill, the Australian Sugar Milling Council and DNRM and been unable to identify any further evidence that the sugar mill levy was intended to constitute a capital contribution.

3.8 Commonwealth Government Funding

From 1982-83 to 1992-93, the Commonwealth Government provided \$197.4 million towards expenditure on the Burdekin Falls Dam and associated infrastructure, under the *National Water Resources (Financial Assistance) Act 1978*.

Commonwealth funding was provided by way of annual non-repayable grants that reimbursed the Queensland Government’s expenditure on the Burdekin Falls Dam and associated infrastructure.

²³ Hill J in *McLennan v Federal Commissioner of Taxation*, 22 December 1989.

Stakeholder Comment

BRIAC submitted that the Commonwealth grant had been written off by the Commonwealth Government.

BRIAC submitted that the Commonwealth funding was a ‘gift’ from the Commonwealth Government and stated that the clear intention of the Commonwealth funding was to promote regional development and to provide assistance to the sugar industry. The BRIAC referred to the following statement made in the Commonwealth Parliament in 1987 as evidence:

The 1987-88 Federal Budget [in which funding was provided to the Burdekin Falls Dam] demonstrates, I believe, the Government’s commitment to non-metropolitan Australians and the development of their industries, such as the sugar industry.

The South Burdekin Water Board and the North Burdekin Water Board submitted that the Commonwealth Government contribution towards the Burdekin Falls Dam was a capital contribution, citing the 1992 Industry Commission report on Water Resources and Waste Water Disposal which had referred to the funding as being ‘written off’. A similar comment was made by BRIAC who, in its submission in response to the Authority’s Draft Report, also queried whether the Authority had properly represented the Commission’s view.

Davco Farming submitted that:

The Federal Government has never expected or desired a capital return on its investment and has been most vocal in its opposition to the State Government claiming and receiving capital payments for funds allocated under the Federal Governments policy to promote and maintain regional and rural development.

SunWater submitted that the Commonwealth grant was not a capital contribution to the Scheme, as it was not tied to any particular purpose apart from the funding of the Burdekin Falls Dam and associated infrastructure. SunWater also submitted that there was no evidence that Commonwealth funding was intended to affect ongoing water charges and, if the Commonwealth had intended to confer a benefit to particular groups, it would have chosen a different vehicle to that of reimbursement of State funding.

Furthermore, SunWater submitted that the Commonwealth grant should be viewed as part of the State’s overall funding base. SunWater noted that, under the Australian system of public finance, there is a vertical fiscal imbalance between the Commonwealth and State and, in this context, the specific purpose of the grant was to fund the Burdekin Falls Dam without impacting on other State programs.

The Commonwealth Department of Agriculture, Fisheries and Forestry – Australia advised that the general intention of Commonwealth funding was to provide financial assistance for water resource projects and that, while the Commonwealth Government Water Policy of the time notes that ‘water prices need to be set at a level to cover the full cost of water supply including adequate depreciation’, pricing policies were a matter for the Queensland Government.

In response to the Draft Report, the Commonwealth Minister for Agriculture, Fisheries and Forestry, the Hon Warren Truss, has submitted that, in his view, the Commonwealth grant was intended to be a capital contribution and to result in lower prices for users and advised that :

- as the grant was non-repayable and non-interest bearing, the Commonwealth had no intention of recovering these funds and the Minister assumed ‘that Queensland would not recover these sunk costs either’;

- as the Commonwealth grant was provided by way of non-repayable non-interest bearing grants, it follows that it was the intention of the Commonwealth to ensure that the price of water to users would be less than it would otherwise have been;
- ‘It is therefore clear to me that the Commonwealth funding for the dam was provided with an expectation that it would be used to make water affordable to users, even though this may not have been specifically documented in those pre-COAG-agreement times’.
- as the agreement and construction of the dam were both before the recognition of full cost recovery principles by COAG in 1994, there is no requirement under the COAG water reforms for Queensland to recover the construction cost; and
- other states view capital investment prior to 1994 as sunk costs but, in line with their commitments under the COAG agreement, seek to recover future asset replacement and refurbishment costs.

BRIAC referred to Minister Truss’ correspondence as evidence of the Commonwealth Government’s intention that the grant be viewed as a capital contribution.

In response to the Authority’s Draft Report, BRIAC also submitted a number of statutory declarations from parties involved in the negotiations surrounding the Scheme, to the effect that the Commonwealth Government never stated that a rate of return would be required in relation to the Commonwealth grant:

- Ross Noel Chapman (former Manager of the Burdekin District CANEGROWERS Executive) submitted that, based on his involvement at the time, the Federal Government did not expect a return on capital;
- Lyndsay George Russell Hall (Chairman of the Queensland Council of Agriculture and Member of the Burdekin Dam Project Advisory Group) submitted that the Federal Government never sought a rate of return on its investment, justifying spending tax-payers’ money on the basis that the development would produce its own returns by providing export earnings, greater employment and benefits to downstream industries; and
- Leslie John Searle (former Chairman of the Burdekin District CANEGROWERS Executive and Executive Representative on the Burdekin Dam Project Advisory Committee) submitted that the Dam was constructed by grant funds from the Commonwealth Government ‘on the anticipation of the Australian Tax Payer being reimbursed by income to the Government by the extra crops that would be grown in the area’.

QCA Analysis

With respect to financing arrangements, if the State was able to finance the development of the Burdekin Scheme without Commonwealth assistance, the provision of Commonwealth assistance could represent risk sharing by the Queensland Government or an intention by the Commonwealth to provide lower prices for users.

Queensland Treasury advised that the Queensland Government could not fund the Burdekin Scheme without Commonwealth assistance. An extract of a letter discussing the Scheme development from the (then) Premier to the (then) Prime Minister states ‘the costs of a scheme of the magnitude of the one proposed exceeds the capacity of funds available to the State within our normal water development programme, even if augmented by grants under the National Water Resources Programme.’ While this indicates that funding was a key concern, it does not

provide any insight into the issue of whether any pricing benefits were intended from any Commonwealth funding.

With respect to the reference in an Industry Commission report that the Commonwealth Government capital contribution was ‘regarded as written off’, the Authority notes that the reference related to a financial analysis of the Scheme conducted by the WRC and the Department of Primary Industries in 1990 which had excluded the cost of Commonwealth funds from the economic and financial analysis.²⁴ The Industry Commission was commenting on the inappropriateness of not including the Commonwealth contribution for the purposes of a benefit cost analysis.²⁵ However, this has no direct implications for water pricing. The Industry Commission did not sanction writing off the Commonwealth contribution or accept that it had been written off. In this regard, it is noted that the Commission stated that:

In the Commission’s view, this sort of reasoning has been used for too long to discount the cost to the community of poorly performing investments... To now argue that the Commonwealth’s investment has not been written off because there will be broad community benefits from the project, is to ignore the likelihood that funds invested in more productive ways would have generated even greater benefits from the wider community.

The Commission further recommended that:

Prices for irrigation water supplied from existing bulk water system should at least cover irrigators’ share of the costs of operating and maintaining those systems, including dams and storages. For systems where demand for water is sufficiently strong, *a return on capital should also be sought...* (emphasis added).

Irrigators’ share of the full costs of refurbishments to existing bulk water supply systems, including a minimum 5 per cent real return on capital, should be factored into bulk water charges... for an interim period, prices charged to irrigators may need to be subsidised...

Where the purpose of the intergovernmental arrangements is not clear, it may be more appropriate to leave its nature to be determined by the receiving entity. However, despite the considerable assistance of the relevant Government agencies, the Authority has been unable to uncover any evidence, one way or the other, regarding the Queensland Government’s view as it related to rural water prices at that time.

It is noted that the 1980 report to Parliament stated that an approach had been made to the Commonwealth for funding assistance. However, the nature and extent of the Commonwealth contribution was unknown at this time and was thus not included in the report. The report stated an expected real return on total capital of 2.05%. The Authority notes that the inclusion of Commonwealth funding as a capital contribution raises the expected rate of return indicated in the 1980 report to a more commercial level. This could imply that the Commonwealth grant was intended as a capital contribution, although this is not the only possible interpretation.

The lack of any formal consideration of the pricing implications for irrigation of the Commonwealth grant was not surprising as the grant was made in an era when there was not the focus on commercial returns that is the case following the implementation of national competition policy. In this regard, it is noted that the pricing arrangements for BRIA irrigators did not change following the development of the Scheme, despite the substantial capital expenditure involved.

²⁴ Queensland Department of Primary Industry, 1990.

²⁵ Industry Commission 1992, pp. 211-224.

As will be discussed in the context of State funding, the focus was on funding the Scheme not pricing, with a variety of State and Commonwealth funding sources being used depending on their availability.

In addition, to treat Commonwealth grants differently to State funding may result in inappropriate resource allocation between competing rural water supply schemes depending on their funding mix.

Pricing was a separate issue determined more on the basis of capacity to pay rather than commercial pricing principles. This is the case for most, if not all, rural water schemes in Queensland.

The Authority accepts the further submissions of Minister Truss that the Commonwealth payment was made to the Queensland government on a non-interest bearing and non-repayable basis. Indeed, that is totally consistent with the Authority's understanding of the matter.

However, the Minister's comments do not provide any contemporaneous evidence regarding the more difficult issue of whether, at the time the payments were made, the Commonwealth government did so with a requirement or expectation that the payments be used to provide a corresponding reduction in the price of water to users, regardless of the capacity of users to pay. In this regard, the Authority's research indicates that the focus of the Commonwealth (and the State for that matter) was on funding the scheme and its resultant regional development, and that pricing was not considered. In support of this, the Authority notes the comments of the Commonwealth Government Department of Agriculture, Fisheries and Forestry (22 August 2002) that, at the relevant time, the general intention of Commonwealth funding was to provide financial assistance for water resource projects and that pricing policies were a matter for the Queensland Government.

In respect of claims that the Commonwealth expected to receive its returns through indirect benefits and multiplier effects, the Authority accepts that this may have been the case. However, the funds were provided to the State and it was open to the State to apply those funds on whatever terms it considered most appropriate. The only restriction was that the funds be expended on the construction of Burdekin dam.

The Authority noted in its Draft Report that it was aware of a press report quoting the Deputy Premier of Queensland in 1987 to the effect that urban water users in Townsville would not be charged a rate of return on the Commonwealth funding.²⁶ Since then, the Authority has sighted a Cabinet decision supporting this statement. However, it is also clear from the associated Cabinet submission that the decision to exclude the Commonwealth funding from Townsville urban water pricing was an exception to then government policy being applied to other urban and industrial pricing arrangements throughout Queensland.

While the decision and the press reports of Deputy Premier Gunn's comments related only to Townsville urban water pricing, the Authority recognises that some irrigators may have inferred (or hoped) from the press reports, as well as from past preferential arrangements provided to rural water users, that similar arrangements to those announced for Townsville urban users would also apply to irrigators using water from the Burdekin Dam.

However, the press reports (and the decision) clearly related only to urban water in Townsville and the Authority notes that the Queensland Government made no representations regarding the treatment of Commonwealth funding for irrigation prices at the commencement of the Scheme or over the time of land releases and that, indeed, the Queensland Government signalled that

²⁶ Statement by the Deputy Premier of Queensland, *Townsville Daily Bulletin*, 30 May 1987.

prices may change in the future. Thus, any view that water prices paid by irrigators would never incorporate any return on the Commonwealth funding amounted to a supposition by irrigators. It did not represent a reasonable expectation on their behalf.

Members also were not convinced that the amounts bid at auction would have been influenced by this matter. Amongst other things, there was still the issue of the State funding on which a rate of return was not being achieved and the then known moves towards more cost reflective pricing. In addition, the Authority notes that, even if irrigators had bid less at auction for BRIA land as a result of their ‘expectations’, there would be a corresponding reduction in the capital contributions implied in land/water sales revenues. Lower auction prices would therefore result in a higher “unaccounted for capital” value for the purposes of assessing whether or not SunWater’s charges include an excess return on capital.

In summary, the Authority considers that the situation with respect to Commonwealth funding is as follows:

- there was a desire to proceed with the Burdekin Scheme because of its perceived economic benefits, including regional benefits;
- the size of the project was such that the Queensland Government did not have the capacity to fully fund the project or to fully assume the financing risk, particularly given the current water pricing policies and the capacity of users to pay the full cost of construction at that time;
- to enable the project to proceed, the Commonwealth provided funds to the Queensland Government to reduce its funding and financing risks;
- the issue of pricing was left to the Queensland Government to determine;
- the Queensland Government continued prevailing prices in the Burdekin, which were, in accordance with then current irrigation water pricing practices, set at less than full cost;
- the Commonwealth was most likely aware of this situation and may well have supported the Queensland Government’s approach. However, this is not the same as saying that the Commonwealth intended that, regardless of capacity to pay, no user, current or future, should ever have to pay a price for water which included a return on the funding provided by the Commonwealth; and
- while some irrigators may have inferred (or hoped) otherwise, from the press reports surrounding Townsville urban water pricing, there was no substantive basis for irrigators to form a reasonable expectation that their water prices would never incorporate any return on the Commonwealth funding.

Since the Scheme was developed, in the interests of more efficient resource allocation, the State has moved to more cost reflective and commercial pricing, including water pricing. This commenced before COAG but was reinforced by COAG and national competition policy reform. Water is not the only area affected by this development nor is it immune from it.

In respect of COAG full cost recovery principles, the Authority notes that all jurisdictions have committed to the achievement of a positive real rate of return on the written down replacement cost of rural water assets, wherever practicable. There is no suggestion that pre 1994 assets should be valued at zero for pricing purposes regardless of the circumstances.

So far as the approaches adopted by other States are concerned, the Authority is aware that Tasmania does consider that Government investment in infrastructure is a sunk cost for pricing

purposes and that few, if any, states have achieved a rate of return on capital on rural schemes at this time. For example, in setting prices for rural water assets, IPART has not incorporated a rate of return on pre-1994 assets. However, for urban water service providers IPART does incorporate pre-1994 assets in the asset base by imputing a value from the revenue stream at a particular point in time. In addition, the Authority is aware that the pricing policies of Victoria, Western Australia and South Australia do not preclude the recovery of pre 1994 capital cost if considered appropriate in the circumstances.

It should also be noted that, while the Authority considers that the Commonwealth funding is not a capital contribution, prices have not changed in real terms since the commencement of the auction of land. In addition, the Authority has not been asked to advise on what level of return should be sought in the current circumstances. As will be subsequently addressed, a key issue here is the capacity of irrigators to pay (see Chapter 7).

3.9 State Funding

The Queensland Government's \$389.6 million expenditure on the Scheme was provided from a mix of funding sources, including debenture loans and Consolidated Fund budget allocations. All funds were deposited in the Queensland WRC Construction Trust Fund (subsequently the Burdekin Water Supply Construction Fund), from which expenditures on the Scheme were made.

Stakeholder Comment

BRIAC submitted that funding provided from State Consolidated Revenue should effectively be considered a capital contribution. It submitted that it was arbitrary to seek to recover money from Consolidated Revenue on irrigation schemes, while declining to seek to do so in the case of the construction of schools or hospitals or from welfare recipients.

BRIAC submitted that only the component of State funding provided through earmarked loans should comprise the regulatory asset base of the Scheme. As debt was cancelled upon corporatisation, this approach effectively reduces the asset base to zero.

SunWater did not distinguish between the sources of State Government funding and proposed that this funding be considered as part of the relevant asset base for pricing purposes.

QCA Analysis

It is important to consider the treatment of State funding towards the cost of the Scheme in the context of overall water resources funding at the relevant times. In this regard, sources of funding included State Loan Fund allocations, debenture borrowing allocations, including special debenture borrowing allocations approved by Loan Council for specific projects, Consolidated Revenue funding provided via the Special Project Fund and, of course, Commonwealth grants.

A review of State budget papers reveals that the mix of funding for water resource projects was determined by the relative availability of the various sources of funding rather than by any conscious decision about debt versus equity or about repayable versus non repayable. The mix varied annually and different projects were funded by different mixes annually. The focus was on funding a substantial capital program for employment and economic development purposes.

Accordingly, the Authority considers that all State funding should be treated the same, regardless of its source.

The Authority does not accept the submission that payments by the Queensland Government for schools and hospitals are akin to those provided to SunWater.

The Authority has not identified any evidence that State Government funding, through budget funding or otherwise, was intended to provide lower prices to users. In this regard, as discussed in the section on Commonwealth funding, water pricing was considered separately from funding.

The Authority notes that, at the time of corporatisation, the Queensland Government did not require SunWater to assume responsibility for prior debt. However, in return, the Queensland Government received a greater degree of equity in SunWater and placed corporate management requirements on SunWater which are outlined in the SCI. It also placed certain liabilities related to water infrastructure in Queensland on SunWater.

Taking account of all of the above, the Authority considers that Queensland Government funding does not represent a capital contribution to the Scheme.

3.10 Additional Issues Regarding Government Funding

Necessary for Project to Proceed

Stakeholder Comment

CANEGROWERS contended that Government payments made in the past were a capital contribution as without this the project would not go ahead.

QCA Analysis

The Authority accepts that Government funding from all sources was required for the Scheme to go ahead. However, this does not imply that the Queensland Government decided to forego ever achieving a rate of return on any particular source of funding.

Gift to Irrigators

Stakeholder Comment

CANEGROWERS contended that Government payments made in the past were a gift from government to irrigators.

QCA Analysis

There is no evidence that government funding was a gift from government to irrigators. The issue of the intentions of the Commonwealth and the State regarding their funding has been considered above.

Risk Reduction

Stakeholder Comment

CANEGROWERS contended that Government payments made in the past were payments to reduce the risk of the dam so that it was commercially attractive.

QCA Analysis

The level of government funding may well have been designed to reduce the financial risk. It, however, does not preclude the Government seeking a rate of return on its investment.

Historical Perspective

Stakeholder Comment

CANEGROWERS indicated that it considered the Authority was taking an unrealistically hard line in applying its criteria for recognition as a capital contribution. In relation to Government funding, they argued that historical reasons for government capital injections in irrigation developments have been non-commercial in nature, including decentralised development, social issues and the like. Commercial returns on investment did not appear to be a major consideration.

QCA Analysis

Historical reasons for Government investments in other irrigation developments are considered relevant but not binding forever.

The Authority recognises that a more commercial approach to pricing has evolved over time although, in the case of the Burdekin, prices in real terms have not changed since the commencement of the Scheme, even though the structure of prices has been altered with the fixed charge being increased and the volumetric charge decreasing. The ability of Government to make and change policy is outlined in Chapter 7.

Commonwealth Intentions

Stakeholder Comment

CANEGROWERS also contended that if, the Commonwealth had been asked whether it intended the State Government to earn a rate of return on the grant, it would have replied to the contrary.

QCA Analysis

As has been outlined elsewhere in this Report, the Commonwealth confirmed that the issue of pricing, which includes a consideration of the appropriate rate of return on capital (including that provided by the Commonwealth), was a matter for the State.

Irrigator Contributions

Stakeholder Comment

BRIAC argued that, if the Commonwealth and State were prepared to fund the scheme while indicating to irrigators that their payments were capital contributions, that circumstance was a sufficient indication that irrigators would not be charged a rate of return on that part of the cost which was taxpayer funded.

BRIAC also argued that the explicit statements made by Government in relation to irrigator contributions indicate that these payments were meant to delineate the extent of cost recovery from irrigators.

QCA Analysis

The Authority does not agree that any conclusions about the Government's future intentions can be drawn from its preparedness to fund the Scheme and its proposal to treat grower payments as capital contributions. None of the Government statements in relation to grower contributions indicate that a rate of return will never be charged on the government funding for the Scheme (see Chapter 7).

3.11 Additional Issues Regarding Capital Contributions Generally

Recognition through Historically Low Prices

Where a capital contribution is established, there is an issue of whether irrigators have already received offsetting price benefits through lower than efficient historical prices.

For example, if it could be established that prices for 2000-01 within the price path (for which the Authority has calculated the efficient capital asset base) lay below the efficient cost-based price, then irrigators may have been compensated to some extent through lower than efficient historical prices.

Stakeholder Comment

SunWater submitted that, should irrigators' payments be considered to be capital contributions, past price reductions have more than compensated the contributors for their contribution. In support of this, SunWater argued that, assuming SunWater's maximum allowable revenue varies in a direct relationship with land served by the Scheme (this approximates the optimal staging of assets), SunWater's historical revenues were so far below its maximum allowable revenues that the value of irrigators' capital contributions would have been fully consumed by October 2000.

QCA Analysis

Determining whether irrigators have previously received offsetting price benefits, to the extent that no further compensation for the capital contributions is necessary, is difficult to establish as:

- the historical accounting data on Scheme revenues and costs is not available for BRIA specifically, or is not sufficiently detailed, to accurately determine the magnitude of any operating profits or losses. Reliance on historical accounting data is further complicated by the inconsistencies in data reporting standards since the Scheme's development; and

- even if it were found that such a benefit was received by irrigators, there is then the issue of whether the Burdekin Scheme was optimally staged in respect of construction, pace and location of channel and land development, or whether an optimal development of the Scheme could have resulted in different net operating profits or losses.

Notwithstanding these concerns, the Authority accepts the analysis submitted by SunWater as representing a reasonable approximation of the benefits that growers have obtained through the application of historical prices which are less than the maximum price that a commercial entity could have charged, if growers had a capacity to pay these prices.

At the same time, however, the Authority also notes that the policy of less than commercial prices was designed to promote economic growth.

The question then arises as to whether it is legitimate to offset the capital contributions by the benefits of past price concessions when the past concessions were part of a conscious government policy. To do so would be to negate the intended benefit. Further, there is no evidence of an intention to recoup the benefits of past lower than commercial prices.

In this latter regard, there was a clear government intention that capital contributions by irrigators would be recognised for pricing purposes. The Authority considers that this was intended to be an ongoing commitment.

Accordingly, the Authority has decided that it would not be appropriate to offset irrigator capital contributions by the extent to which historical prices to irrigators were lower than maximum prices a commercial entity could charge.

Identification of Beneficiaries

Where capital contributions have been made, an assessment needs to be made as to whether it is feasible to establish individual capital contributions with sufficient precision to enable individual users' prices to be adjusted over time. In doing so, compliance and administration costs need to be considered.

Alternatively, where one particular group of users were the sole contributors, capital contributions may be offset against the relevant regulatory asset base for those particular users.

If individual pricing or pricing for particular groups is not found to be possible, then the sum of the capital contributions should be offset against the total value of the relevant assets. Any benefits will thus be distributed between all users.

An additional issue arises as to whether new users, who have purchased assets from original users, should benefit from historical capital contributions. For example, if an irrigator purchased land at auction, and subsequently sold their farm to a new purchaser, should the new purchaser benefit from the capital contribution previously made in respect of that property ?

Stakeholder Comment

SunWater submitted that:

- irrigators' payments 'were never linked to any particular Scheme asset and there is no basis for the irrigation farmers to claim any entitlement to any interest in any Scheme asset';

- references to ‘once only capital contributions’ in the materials referred to by irrigators were made only in respect of the initial grant of water allocations, as opposed to ongoing charges for the supply of water pursuant to the allocations; and
- licences that conferred water entitlements did not confer rights in perpetuity and, although the licensee could apply for renewal of the licence before it expired, the Chief Executive still retained an unfettered discretion as to whether to renew the licence.

QCA Analysis

The Authority has identified a range of capital payments made by a range of parties. Some payments are identifiable on an individual farm basis, such as net returns from auction of land and water allocations. Other payments can be attributed to particular assets, but cannot be individually attributed to any particular user or group of users, such as the Commonwealth’s non-repayable grant towards the Burdekin Falls Dam. It is accepted that irrigators’ payments were never linked to any particular water infrastructure asset.

Although information on certain individual contributions is available, the Authority considers that the administration and compliance costs of applying differential pricing arrangements on an individual farm basis over time would neither be practical nor cost effective. For example, auction farms represent 181 out of a total of 362 farms in the BRIA and individual farm recognition would require at least as many different pricing arrangements.

On this basis, the Authority has concluded that it is not appropriate to seek to adjust individuals’ prices for their share of recognised capital contributions. However, it is considered feasible to adjust channel and river irrigators’ prices for this purpose. Capital contributions made with the intention of benefiting all users (including BRIA irrigators, the North and South Burdekin Water Boards and NQ Water) should be reflected in pricing benefits for all users.

Where capital contributions are made by customers and the land is then on-sold, the sale of land does not provide a basis for ceasing recognition of capital contributions unless that formed part of the original agreement. No evidence of this intent is available. However, where licences were cancelled or surrendered, it is open to SunWater to establish the basis on which they would be re-issued.

Should upfront charges be applied in the future, the nature and intent of the charge (including whether it forms a capital contribution or a net gain for SunWater) should be specified, as it will affect the expectations and therefore the investment decisions of irrigators. For example, where sales of water entitlements are not intended to constitute a capital contribution to scheme development costs, this would need to be clearly stated. In this event, the revenues from the sale of water entitlements would not be offset against water delivery charges.

Aging of Assets

An issue arises as to whether capital contributions made by a user (or group of users) should take into account the aging of assets over time and, furthermore, if an asset has been substantially replaced, whether the original contributor should continue to receive pricing benefits as a result of the original contribution.

Stakeholder Comment

BRIAC commented that capital contributions should not be depreciated where depreciation has already been charged to users in respect of that asset. BRIAC argued that, with the change to

renewals annuity accounting, past depreciation allowances should have been credited back as user contributions.

QCA Analysis

The Authority accepts that capital contributions should not be depreciated when depreciation has been charged to users. In the current case, however, the historical records are incomplete and there is no evidence that past prices included a component to cover depreciation, either partially or fully. Accordingly, the Authority has established a new base by indexing and depreciating both the capital cost and the capital contributions down to October 2000. In addition, the Authority has optimised the capital cost without any corresponding impact on associated capital contributions. From 2000 on, a renewals annuity approach has been adopted and both the new base capital cost and capital contributions do not depreciate.

Prevalent Pricing Practices

Stakeholder Comment

BRIAC has stated that, as Government did not seek commercial cost recovery at the time the Commonwealth funding was provided, it can be imputed that the funding was a capital contribution. Moreover, they state that, as prices did not change following the development of the Scheme, this is further evidence that full cost recovery was not required.

QCA Analysis

Whilst the Government did not seek a commercial rate of return at the time the Commonwealth funding was provided, there was a consistent pattern of advice regarding the Queensland Government's intention to move to commercial pricing practices from around the time of the commencement of the auctions in the Burdekin Scheme (see Chapter 7).

In addition, in the absence of any actual or implied contractual arrangements, the Authority considers that government has the power to alter existing pricing arrangements even though they may adversely impact on a particular individual or group of individuals.

Taxation Approaches

Stakeholder Comment

BRIAC has argued that taxation laws do not allow deductions to be claimed on expenditure recouped through other means, require that grants be treated as revenue, and that a gifted asset has no cost base for depreciation purposes.

QCA Analysis

Taxation approaches to deductions and depreciation do not limit the Authority's approach for pricing purposes. Moreover, taxation laws do not provide any restrictions on the pricing of goods and services. For example, taxation laws would not prohibit an individual or entity from seeking to charge a rate of return on non-repayable and non-interest bearing funds given to them by another party (including the government) in order to fund a business.

Vertical Fiscal Imbalance

Stakeholder Comment

In response to comments made by SunWater that Commonwealth funding was provided as a result of vertical fiscal imbalance between the Commonwealth and the States, BRIAC has argued that vertical fiscal imbalance is not relevant to the consideration of whether the Commonwealth grant is a capital contribution.

QCA Analysis

The Authority's treatment of Commonwealth funding is in no way related to the issue of vertical fiscal imbalance.

Mareeba Dimbulah Scheme

Stakeholder Comments

The Mareeba Dimbulah Customer Council (MDCC) submitted that Government funding provided to the Mareeba-Dimbulah Scheme was envisaged as a capital contribution in a 1952 report to Parliament:

... it is also proposed that the interest and redemption charges on the capital cost of the works shall be met from consolidated revenue and not charged to the Irrigation Area Trust Fund...

... experience with large irrigation schemes in other States has shown that it is necessary for the Government to meet all annual charges other than those with respect to maintenance, operation and administration...

... it is not possible in any large irrigation project to meet all annual charges from direct revenues. Charges for water and drainage must be fixed at rates that farmers can reasonably be expected to meet...

...direct revenue from the Mareeba-Dimbulah Project will be sufficient to make some contribution towards capital charges but it is considered essential that the remainder of such charges be met by the State or State and Commonwealth together, both of which will receive a substantial indirect return from the Project.

The MDCC stated their belief that the position adopted by Government in their Scheme was representative of most, if not all, irrigation schemes in the State.

QCA Analysis

The Authority is required to limit its assessment of capital contributions to the circumstances of the Burdekin Scheme.

3.12 Conclusions

Capital contributions made towards assets in the Burdekin Haughton Water Supply Scheme are detailed in Table 3.1 below (further detail is provided in Table B.3 in Appendix B). These payments are allocated to user categories in the Scheme in Chapter 4.

Table 3.1: Summary of Capital Contributions

<i>Contributions</i>	<i>\$ million</i>
Retention Farms (Headworks Contribution)	9.4
Auction Sales of Land	29.3
Water Sales	
Auction	17.4
Non-Auction	13.3
Meters and Barratta Main Channel Upgrade	2.2
Total	71.6

The value of capital contributions has been increased from \$63.2 million as reported in the Draft Report as a result of a revision to the concessional finance costs deducted from land sales, the inclusion of a council capital contribution for road works and revised data for meters and Baratta Main Channel upgrades.

4. UNACCOUNTED FOR CAPITAL

Summary

The Ministers' Direction requires the Authority to establish any capital not accounted for by capital contributions. For this purpose, the Authority was required to consider the use of the asset valuation established by Arthur Andersen unless the Authority considered another valuation was more appropriate.

After considering the alternative asset valuation methods, the Authority considers that depreciated optimised replacement cost (DORC) is the appropriate method for the valuation of assets for the purposes of determining the maximum prices that could be charged. At the same time the Authority notes that it may not be possible to set prices at that level.

In its determination of unaccounted for capital, the Authority first established the depreciated replacement cost of the Scheme as at October 2000. The Authority then optimised the asset base to take account of redundant assets, over-engineering and excess capacity as well as assets not previously included in the asset base but which would typically be found in an asset base for regulatory price setting purposes. The optimised asset base was then allocated across the respective user categories. The Authority then offset against the optimised asset base the capital contributions made in respect of the assets.

The Authority considers that, for BRIA irrigators, the capital not accounted for by capital contributions was \$200.6 million as at October 2000.

4.1 Approach Adopted

To determine the capital incurred in respect of the Burdekin River Irrigation Area not accounted for by capital contributions, the Authority first estimated the value of the Burdekin Haughton Water Supply Scheme. The Authority then offset against this value the capital contributions made in respect of the Scheme, as assessed in chapter 3. Using appropriate allocators where necessary, the situation in respect of the BRIA was then determined.

4.2 Approaches to Asset Valuation

Asset Valuation Approaches

There are a variety of asset valuation methods which are used, for different reasons and in differing circumstances, by both the private and public sectors. However, these methods can be characterised under two main approaches, namely, cost-based and value-based approaches.

Cost-based approaches relate the value of an asset to the cost of purchasing the asset or the service potential embodied in the asset, either at original cost or current replacement cost.

Cost-based approaches include:

- *historical or actual cost*, which uses the actual dollar cost of acquiring the asset, including the relevant financing cost during construction and installation, as the value of the asset;
- a variant of historical cost, *inflation adjusted actual cost*, which attempts to adjust the asset value for inflation. This can be done by revaluing assets according to some broad indicator of the movements in prices such as the CPI;
- *reproduction cost*, which is the cost required to reproduce the existing plant in substantially its present form using the production technology and specifications of the

original asset. This approach is most relevant where the existing asset still represents significantly unchanged technology;

- the *replacement cost* of an asset, which is an estimate of the current cost of replacing the asset with one which can provide equivalent services and capacity to the asset being valued. It measures what it would cost today to provide an asset to deliver the same service potential, including any existing over-servicing or over-capacity; and
- *optimised replacement cost*, which is an estimate of the current cost of replacing the asset with one which can provide the required service potential in the most efficient way possible. Under this approach, asset values are adjusted if assets exhibit excess capacity, are over-engineered, are sub-optimally designed (having regard to technological advancements) or are poorly located.

Under cost-based approaches, depreciation is typically applied to reflect the service potential of the asset which has expired. In particular, *depreciated actual cost* (DAC) and *depreciated optimised replacement cost* (DORC) have been applied in regulatory decisions in Australia.

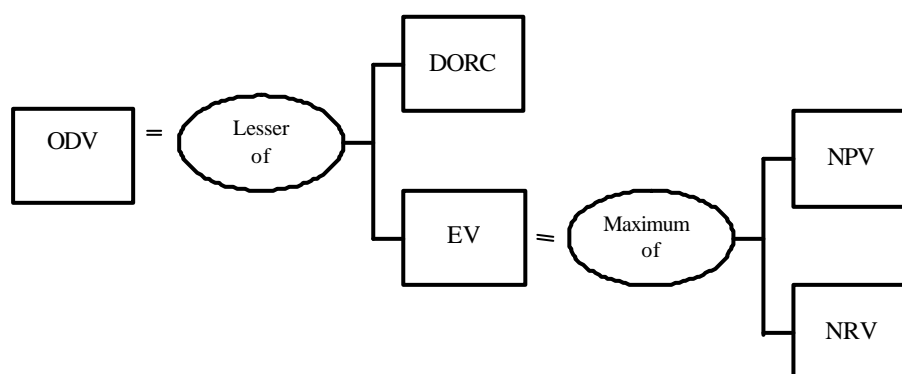
Value-based approaches determine the value of an asset by reference to its net cash-generating capacity. The value-based approaches include:

- *Net Present Value* (NPV), which values an asset as the present value of the predicted cash flows generated by the asset; and
- *Net Realisable Value* (NRV), or fair market value, which is the price that the asset would achieve if sold in an open market.

In a regulatory context, value-based approaches are often affected by the problem of circularity as the asset value is determined by (regulated) prices and revenues which, in turn, are based on the asset value.

A hybrid approach, referred to as the optimised deprival value (ODV) method, values an asset as the loss that might be expected if the entity was deprived of the asset. ODV is the lesser of the DORC and the Economic Value (EV) of an asset, where the latter is the maximum of the asset's NPV or NRV. If EV is less than DORC, then the asset would not be replaced. On the other hand, if EV is greater than DORC, then the asset would be replaced.

Figure 4.1: Optimised deprival value



ODV has been endorsed by COAG as the preferred approach for valuing network assets for public reporting processes (performance monitoring) and by the Agricultural and Resource

Management Council of Australia and New Zealand (ARMCANZ) as a basis for water pricing, unless specific circumstances justify another method.

Other Jurisdictions

There appears to be a general move by Australian regulators to adopt DORC as the preferred method for valuing utility assets. However, in recent water sector regulatory decisions, the ODV approach has been preferred.

In New South Wales, all irrigation water assets put in place prior to 1 July 1997 were valued at zero by IPART for pricing purposes. IPART has stated that, as irrigators were originally attracted into agriculture by the provision of heavily subsidised infrastructure, they should not now be expected to pay a rate of return on assets that would not have been put into place if subjected to commercial scrutiny (2001, p. 23). However, water assets put in place after 1 July 1997 are incorporated in the asset base at their DORC value.

For urban water pricing, IPART (2000a) estimated the EV as the NPV of existing cash flows projected into the future, and included anticipated future capital expenditure at its DORC value. In the ACT, the Independent Pricing and Regulatory Commission (IPARC) adopted a similar approach to IPART for the water assets of the Australian Capital Territory Electricity and Water Corporation (ACTEW), but applied DORC for electricity assets.

In Tasmania, GPOC based the asset values on ODV, using DORC.

Table 4.1: Approaches to the valuation of water assets by other regulators

Regulator/Decision	Approach	Comment
IPART – Department of Land and Water Conservation (2001b)	Line in the Sand approach: pre-1997 assets valued at zero; post-1997 assets valued at DORC	IPART concluded pre-1997 assets were ‘sunk’, with no opportunity cost, and these assets were valued at zero. Post-1997 assets were incorporated in the asset base at DORC.
IPART – Hunter Water, Sydney Water, Gosford and Wyong Councils (2000a)	ODV (EV)	Asset values for first regulatory decision based on NPV of cash flows.
IPARC (ACTEW) (1999)	ODV	Opening value based on DORC for electricity assets, EV (NPV of cash flows) for water and sewerage assets.
GPOC (2001)	DORC	DORC for Hobart Water, methods used for other authorities based on independent valuations.
Ofwat (1999)	Modern Equivalent Replacement Cost	Method appears analogous to DORC.

Stakeholder Comment

BRIAC submitted that:

- there are significant issues related to the adoption of DORC valuations but concluded that the correct basis of computing capital costs should be based on the lower of the DAC or DORC as, if an incumbent supplier can service the market, all that person requires is a return on DAC but if that results in a price above DORC, the supplier faces the prospect of new entrants attacking his incumbent position;
- the chosen asset valuation method used should exclude past capital invested in water infrastructure as this capital is ‘sunk’ and has no alternative use - ‘once capital assumes a fixed form such as water channels or dams, it has lost the opportunity to turn itself into capital elsewhere and its value is simply its scrap value’. BRIAC further argued, that to

do otherwise would promote inefficient and wasteful alternative investment. At the same time, BRIAC acknowledged that this approach would not provide the right incentives for future investment ‘since future investment would be prejudiced if the expected ex ante returns were seen to be retrospectively expropriated ex post’; and

- DORC is based on subjective assumptions on how the asset would be replaced and is inconsistent with current tax and financial accounting principles for asset values.

SunWater considered that DORC was the appropriate basis for the valuation of the Burdekin Scheme’s asset base as it reduces the scope for regulatory risk in respect of sunk assets, provides incentives for optimal future investment, supports operating capability maintenance, and avoids inefficient bypass.

Both SunWater and BRIAC specifically rejected the EV approach citing its circularity. As indicated previously, the circularity occurs as regulated prices determine the value of the assets, which in turn, contribute to setting the price.

SunWater further submitted that a ramification of prices set at below DORC based levels in the long term would be that the service provider would not replace assets when exhausted and would stop providing services to users at that time. In addition, the service provider would not invest further in assets. CSO payments would be required to ensure service delivery. SunWater stated that such a situation would only be likely to arise where substantial assets are dedicated to one or a small number of customers.

The Queensland Farmers’ Federation (QFF) did not outline a preferred valuation method, but stated that, if a cost-based approach is selected as the preferred valuation approach, this should include a rigorous optimisation of the asset base.

In their response to the Draft Report, BRIAC commented that DORC should not be used for pricing purposes because it is not used for a number of other purposes:

- DAC is used for valuing assets for income tax purposes;
- DAC is used for valuing assets for resource rent tax purposes;
- land values used for rating purposes are based on the “salvage value” (site value) of land, excluding improvements; and
- DORC is not used by the accounting profession.

BRIAC also argued that a monopoly service provider has an obligation to be able to justify its charges to its customers and that this “onus of proof” can only be fulfilled using historic costs.

Further, BRIAC resubmitted its view that the New South Wales economic regulator, the Independent Pricing and Regulatory Tribunal (IPART), had accepted that the investment in existing irrigation schemes was sunk capital by adopting its “line in the sand” approach.

MDCC stated that the asset valuation approach taken in Victoria, Western Australia and South Australia roughly aligns with that adopted in NSW by IPART. MDCC further commented on the Authority’s treatment of past investments submitting that:

- public investments have never been treated as commercial investments. MDCC also argue that, in any case, commercial enterprises do not need to get a rate of return on past investments in order to encourage them to make future investments as “for this argument to be valid farmers should expect to receive the same rate of return that they were

obtaining forty years ago and thereby encourage them to make similar investments into the future”; and

- that Government actions have completely changed the investment environment and past investment decisions count for nothing. Furthermore, by taking this stand the Authority is putting Government well above the rest of the community and what the rest of the community finds to be ‘commercial reality’.

BRIAC, CANEGROWERS and MDCC also submitted that past assets have no opportunity cost and should be excluded from the asset base. In support of their views, BRIAC noted that, as future expenditure can be funded by debt finance, a rate of return is not required on past assets, in order to promote an incentive to invest in the future, thereby allowing past assets to be valued at zero.

In their final submission, BRIAC further submitted that they are unable to accept QCA asset valuations knowing that they were essentially derived from the Arthur Anderson valuation which in turn was not based on actual costs.

QCA Analysis

Under the Ministers’ Direction, the Authority was required to use the valuation of assets established by Arthur Andersen (based on DORC) in 2000 for the Queensland Government unless the Authority considered another valuation was more appropriate. The Authority was also required to use the demand forecasts used in the rural water price setting process.

In respect of DAC, the Authority considers that historic cost valuation can at times have advantages in terms of the availability of data as to the actual level of expenditure on assets. However, historic cost valuation approaches:

- do not have any relation to market values or replacement costs and therefore do not provide any relevant signals for future investment or consumption of services by users;
- may lead to price shocks when assets are replaced; and
- even where adjusted to reflect inflation, fail to capture the impacts of technological change or over-engineering.

In respect of DORC, the Authority notes that DORC is applied in most regulatory regimes in Australia and, while there is a degree of subjectivity associated with it, it provides a conceptually sound basis for regulatory price setting. It is consistent with the concept of an upper bound under COAG.

DORC represents the value of assets consistent with the maximum price achievable in a competitive market. For any new projects, and indeed for all assets, SunWater as a commercial service provider should seek to achieve a commercial rate of return on DORC. This will ensure that services are provided on a sustainable basis with consumers paying, and investors receiving, prices consistent with the current cost of the delivery of services.

Furthermore, the Authority’s optimisation approach provides that only assets appropriate to anticipated demand are included in DORC. Arbitrary exclusion of assets on the grounds that they are sunk fails to provide management with the incentive to enhance shareholder value, and does not provide incentives for the better management of assets or for future investment. DORC ensures that over-capacity, over-engineered and over-designed assets are not included in the asset base and consequently are not paid for by customers. It also allows for technological change.

The Authority accepts the circularity problem associated with the use of the EV method of asset valuation in a regulated environment. At the same time, however, the Authority also accepts that it may not always be possible to achieve prices for services that reflect a full recovery of DORC. In this regard, the price that can be attained for a service once the assets have been put in place will be affected by prevailing market circumstances, including the capacity of users to pay. In those circumstances, the value of the assets will be equal to the NPV of the anticipated cash flows generated by the asset or the NRV of the asset - that is, the EV of the asset. However, the issue of how to estimate the anticipated cash flows remains.

Accordingly, the Authority considers that DORC is the appropriate methodology for the valuation of assets for the purposes of determining the maximum prices that could be charged while at the same time the Authority notes that it may not be possible to set prices at that level.

In responding to BRIAC's comments on the Draft Report, the Authority notes that a variety of asset valuation approaches are adopted, for different reasons and in differing circumstances, by both the private and public sectors. As a variety of approaches are possible, it is critical to ensure that the approach that is adopted is consistent with the purpose of the asset valuation. As noted by Professor Walker in an article attached to the BRIAC submission:

...while CCA [current cost accounting] might be relevant to judgements about appropriate level of pricing (at least, in a private sector context) it does not follow that CCA data are relevant for the purposes of evaluating financial performance...

The Authority agrees that asset values for taxation and accounting purposes are not relevant for pricing purposes. Historical asset valuations are used for taxation and accounting purposes for a number of reasons, including the availability of documentary evidence.

Moreover, the Authority notes that the relevant accounting standard for the valuation of non-current assets provides a choice of valuation approaches - the cost basis or the fair value basis. Fair value is a forward looking approach. It is defined as the amount for which an asset could be exchanged between knowledgeable, willing parties in an arm's length transaction. The majority of a sampled 150 Australian companies use the forward looking approach to value their land and buildings (Petzke and Fowler, 1999).

Prices in competitive markets are determined irrespective of the asset values noted in the accounts or taxation records of any particular private sector entity.

In summary, the Authority must choose an asset valuation methodology which best suits its purpose – and that is to determine the appropriate asset base for pricing purposes. The Authority considers that DORC is the most appropriate asset valuation basis for this.

The asset valuation approach adopted by IPART requires an initial regulatory asset value to be established based on deprival value. In simple terms, that is the lower of DORC and economic value:

- the DORC valuation excludes contributed assets; and
- the economic value is calculated as the net present value of future cash flows at existing price levels. It is referred to as 'line in the sand' in IPART determination reports. The discount rate used is equivalent to the WACC of the water entity.

The regulatory asset base is then adjusted by IPART through time to take account of prudent and efficient future capital expenditure, depreciation, asset disposal and indexation.

The IPART 'line in the sand' asset valuation approach does not automatically value all past assets as zero. Using this approach, IPART has incorporated the value of past assets in

determining bulk water prices for Hunter Water and allowed Hunter Water to continue to earn an ongoing rate of return on those assets.

The Authority is aware, however, that in setting prices for rural water assets IPART has not incorporated a rate of return on past assets. A negative rate of return had previously been achieved on those assets and thus its economic value was negative. However, to carry this forward was considered to distort new investment decisions, and thus IPART valued the existing assets at zero. The Authority has confirmed the above summary with IPART.

The Authority notes that the application of the IPART ‘line in the sand’ approach in the Burdekin assessment would entrench the existing price path for BRIA irrigators, which includes a rate of return on assets, and would not address issues such as capacity to pay.

The asset valuation approaches of other jurisdictions vary. Few, if any, States have achieved a rate of return on their past investments in rural schemes at this time. However, the Authority has been advised that the stances taken by Victoria, Western Australia and South Australia do not preclude achieving a rate of return on past investments in the future.

Exclusion of assets on the grounds that they are sunk fails to provide management with the incentive to enhance shareholder value and does not provide incentives for the better management of assets or for future investment. As noted by BRIAC in its original submission, future investment in regulatory assets will be influenced by past regulatory behaviour, in the absence of enforceable future pricing arrangements.

Furthermore, to automatically value past assets at zero would not be consistent with efficient outcomes that would prevail in a competitive market. For example, it is clearly not the case that a commercial investor who has paid off a rental property using past rental proceeds would or should recover only operating and maintenance costs in the future.

Moreover, to automatically value assets with no alternative use at zero is inconsistent with normal commercial practice. For example, neither mines nor major plant used for specific processing activities are valued at zero simply because the resources employed can no longer be used for another purpose and the investment was undertaken in the past.

Furthermore, with respect to MDCC submissions, while the Authority has proposed to value past investments at DORC, it has also recognised that a full return may not be able to be achieved on this value because of the existence of circumstances outlined in Chapter 7, including the capacity of users to pay. Furthermore, even though a commercial return may not be able to be achieved on past investments because of changed market circumstances, commercial investors continue to seek to gain the maximum return possible in the circumstances. They do not fail to seek a return simply because the investment is “sunk”. The situation is no different with farmers and their past investments.

In response to BRIAC’s ‘onus of proof’ argument, the current assessment is being undertaken by the Authority – there is no ‘onus of proof’ placed on one party or another. The Authority must consider all issues that are material to the assessment. Further, the Authority does not accept that only historic costs can be used in this regard.

In response to BRIAC’s final submission comments on not accepting the QCA asset valuation, the Authority in fact did not use the Arthur Andersen valuation. In this regard, the Authority was required to adopt the valuation of assets established by Arthur Andersen in 2000 for the Queensland Government unless it considered it was not appropriate. The Authority considered alternative methods of asset valuation, accepted DORC and engaged SMEC to assess Arthur Andersen’s estimate of DORC. Because of SMEC’s findings the Authority engaged SKM to

audit the existing asset register and optimise the value of Scheme assets against projected demand.

4.3 Related Matters

Subjectivity in DORC Valuations

Stakeholder Comment

BRIAC has questioned the use of DORC, stating that it is not a true cost but a notional cost, and its assumptions are subjective.

QCA Analysis

The Authority acknowledges that its DORC valuations for SunWater's assets are 'notional' in that they depart from the actual cost incurred in developing the Scheme. However, this allows the Authority to use a value that is more relevant to establishing efficient prices.

The Authority recognises that DORC values are dependent on certain assumptions, and may be subject to alternative views. For this reason it has sought independent expert engineering advice in order to minimise subjectivity.

The Authority considers that the DORC approach to asset valuation is preferable to the use of 'actual' costs. For monopoly service providers, the use of actual costs in determining maximum allowable revenues does not result in appropriate incentives for investment in assets or the management of assets in the most efficient manner.

In addition, the use of actual costs aggregates together expenditures undertaken in different time periods – while the figures are actuals, the results are meaningless.

Consistency in Rate of Return and Asset Valuation Approaches

Stakeholder Comment

BRIAC has argued that if the Authority is to use a private sector approach like the capital asset pricing model (CAPM) and the weighted average cost of capital (WACC) to calculate the rate of return, DAC should be used to calculate the asset value. BRIAC state that CAPM/WACC and DAC are used by the private sector and if the Authority is to be consistent it should adopt all of these approaches.

QCA Analysis

As noted earlier, private sector entities have the choice of valuing non-current assets at cost or fair value. Thus, not all private sector firms use DAC for accounting purposes.

In any case, competitive markets set prices irrespective of the asset values noted in the accounts of the entity. Asset values measured through DAC may be completely unrelated to prices. Moreover, the return on equity calculated through CAPM is determined by reference to movements in share market parameters (share values and dividend payouts), not DAC.

The Authority notes that DORC and CAPM/WACC are both forward looking approaches. It is consistent to use both of these forward looking approaches in determining maximum allowable future revenues for regulatory purposes.

Revaluation Gains

Shareholder Comment

BRIAC submitted the use of DORC is not economically efficient and is fundamentally unsound as a proxy for competitive market outcomes as it results in inflationary indexation of capital costs and thus embeds monopoly rents. BRIAC stated that the Authority ‘writes up the value of Burdekin infrastructure yet does not include such nominal revaluation gains as income and count them as returns to investment’. BRIAC submitted that any upward revaluation of the asset base (or capital gain) should be included as income and offset against the revenue required of users.

QCA Analysis

The Authority’s calculation of the required return on capital does take account of capital gains due to inflation. These capital gains are offset against the overall required return on an annual basis, resulting in a lower maximum allowable revenue requirement for pricing purposes.

4.4 Previous and Current Asset Valuations

Arthur Andersen Valuation

As part of the rural water pricing process, Arthur Andersen valued SunWater’s Burdekin Scheme assets. Using the asset register and other information provided by SunWater, the DORC value of the Scheme assets at October 2000 was \$393.9 million.

The Authority engaged SMEC to assess Arthur Andersen’s estimate of DORC. SMEC considered that the approach adopted by Arthur Andersen was relatively sound. However, because it was applied as part of a state-wide review of all SunWater assets, there was limited opportunity to incorporate local factors. Key concerns related to the heavy reliance placed on indexing past costs, the absence of any consideration of the condition of existing assets, the existence of significant excess capacity and some significant changes in technology.

In addition, SMEC noted that the DORC prepared by Arthur Andersen did not include some assets that would typically be included in an asset base for regulatory price setting, such as:

- working capital;
- road access, electricity infrastructure and telephone infrastructure required to build the Burdekin Falls Dam; and
- some other indirect costs associated with the construction of the infrastructure, such as infrastructure design and construction camp costs.

SKM Valuation

As a result of the concerns regarding the DORC prepared by Arthur Andersen, the Authority sought independent advice from Sinclair Knight Merz (SKM) on the appropriate DORC for the

Burdekin Scheme using the demand forecasts established for the rural water price setting process. SKM was required to:

- undertake an audit of the existing asset register to confirm its appropriateness for calculating a DORC value;
- determine the optimised value of Scheme assets, as at October 2000, sufficient to meet the service requirements of users; and
- undertake an assessment of potential demand growth beyond the current five year price path/demand forecast.

The approach applied by SKM to validate SunWater's existing asset register included field assessment of Scheme assets, a review of the 1997 SWPs' Bill of Materials and a review of additional costs that should be incorporated in the DORC valuation.

In determining its valuations, Arthur Andersen drew from the earlier 1997 Scheme valuation undertaken by SWP, the former commercialised business unit of the Department of Natural Resources and predecessor of SunWater. This valuation was based on a detailed calculation of the quantities of Scheme assets, applied against unit rates and other factors. Spot auditing of these quantities by SKM suggested that they were consistent with the Scheme infrastructure, with some minor inconsistencies.

SKM also reviewed the unit rates provided for in the SunWater valuation. In SKM's opinion, some of these unit rates were inappropriate, and consequently these were adjusted downwards. All other unit rates were retained, though they were adjusted to account for the time difference between the October 2000 valuation date and the date at which the SunWater valuation was undertaken.

In addition, SKM analysed the indirect cost factors (such as administration and design) provided for in the SunWater/Arthur Andersen valuation against SKM's opinion of appropriate industry benchmarks. For distribution assets, a higher indirect cost factor was used. The net effect of these adjustments is that SKM's valuation is higher than that of Arthur Andersen by \$8.6 million.

Finally, an adjustment was made to the capitalisation of interest during construction to reflect the effective WACC rate, as opposed to the assumed rate of interest during construction. This resulted in an upward adjustment of \$13.5 million.

The net effect of these adjustments is to increase the depreciated value of Scheme assets by \$22.1 million. Consistent with SKM's findings, these have been adopted by the Authority for the purpose of the Final Report.

Taking into account these adjustments, SKM reported a depreciated replacement cost for the Burdekin Scheme of \$416.0 million, compared with the Arthur Andersen valuation of \$393.9 million. Table 4.3 refers.

Table 4.3: Arthur Andersen DORC adjusted for Unit Rates, Indirect Costs and Interest Capitalisation

	<i>\$ million</i>	<i>\$ million</i>
Arthur Andersen DORC		393.9
plus adjustment for unit rates and indirect costs	8.6	
plus adjustment for interest capitalisation	13.5	
Arthur Andersen DORC adjusted for unit rates, indirect costs and interest capitalisation		416.0

Stakeholder Comment

In commenting on the Authority’s Draft Report, BRIAC submitted that to substitute retrospectively a deemed WACC (for the purposes of interest capitalisation) for an actual cost of interest to push up assets valuations is an ‘egregious’ example of the arbitrary nature of this capital cost base valuation process - particularly when the funds were provided by governments and largely financed by taxes rather than borrowing.

QCA Analysis

The Authority considers that it is appropriate for the full cost of capital to be earned on all funds expended.

Further, taxpayers funds can be applied to different uses and should therefore not automatically be excused from the requirement to earn a rate of return. That is, there is an opportunity cost associated with the use of those funds.

Working Capital

Working capital represents the capital required to provide for timing differences between cash inflows (revenues) and cash outflows (expenses) over the short term operating cycle of the entity. Working capital is typically measured as the excess of current assets over current liabilities.

Other Jurisdictions

Apart from the Authority, the only Australian regulators to report a position with respect to working capital are the Office of the Regulator General (ORG) and IPART. ORG’s electricity determination (2000) reported that arguments for including a return on working capital pointed to a mismatch between the timing of revenues and costs over an operating cycle which left the entity with a shortfall in revenues. However, in the absence of an appropriate approach, ORG chose not to provide for working capital.

In contrast, IPART (1999e) considered that any business must maintain an investment in working capital to allow it to manage the lag between payments to suppliers and the receipts from customers. Similarly, many businesses also maintain an investment in inventory. IPART noted that to simply apply working capital as current assets less current liabilities would lead to a number of one-off distortions due to the effects of prepaid expenses and accruals. Instead, IPART adopted a simplifying formula to identify the level of working capital which reflected the billing cycle for receipts and payments and allowed for inventories. This formula was based on the assumption that payments from customers were outstanding for 45 days from the day of service delivery and that suppliers were paid 30 days after service delivery.

Stakeholder Comment

SunWater has proposed that provision for working capital be included in the asset base.

QCA Analysis

The Authority accepts that, consistent with business practice, working capital should be included in the asset base. The Authority's determination for electricity distributors (QCA 2001a) and recommendations by the Authority for Gladstone Area Water Board (GAWB)(QCA 2002) included provisions for working capital within the regulatory asset base.

While there is variation in the level of working capital across the industry, SKM's advice to the Authority was that there was an "industry average" for working capital of 5.08% of sales revenue. This is comparable with recent regulatory decisions by the Authority for the electricity industry of around 5.4% and consistent with the level utilised by the Authority in the GAWB assessment.

For the purpose of this assessment, applying the 5.08% ratio, an amount of \$0.6 million is suggested as a reasonable level of working capital.

Road from Mingella to Burdekin Falls Dam

The construction of the Burdekin Falls Dam in the 1980s required the construction of a new 130 km road from Mingella to Burdekin Falls Dam. After construction, the road was gifted to Dalrymple Shire, which took responsibility for ongoing maintenance.

Stakeholder Comment

SunWater submitted that the cost of the road from Mingella to Burdekin Falls Dam should be included in the asset base for regulatory pricing purposes as the expenditure was essential for the construction of the Dam. Further, SunWater submitted that the road was required to be constructed of bitumen standard to minimise the risk of delay in critical materials to the site from adverse weather conditions, and for safety reasons for people living at the site. SunWater costed this asset on an indexed replacement cost basis at \$38 million.

QCA Analysis

SKM confirmed that the construction of a road from Mingella to Burdekin Falls Dam was essential for the optimal construction of the dam.

Further, SKM identified that it was optimal to construct a bitumen road for construction purposes, as an unsealed road would be unpassable and would require reconstruction after each wet season, resulting in delays and an overall increase in construction costs. In addition, a bitumen road would satisfy relevant safety requirements for those people required to service the Dam on an ongoing basis.

However, SKM noted that the road was built to an excessively high standard as it was of two lane width. SKM stated that a single lane bitumen seal as is common practice in the less populous areas of Queensland would be more appropriate.

The Authority has accepted the advice of SKM, and considers that the cost of a single lane bitumen road from Mingella to Burdekin Falls Dam should be included within the regulatory asset base. SKM valued the bitumen road from Mingella to Burdekin Falls Dam at a DORC value of \$16.1 million.

General Access Roads

In developing farmland for sale within the Scheme, a general access road network servicing farms was constructed. These roads have since been gifted to the relevant Councils.

Stakeholder Comment

SunWater proposed that this expenditure should not be viewed as part of the DORC value for pricing purposes, but as an expense to be offset against proceeds from the sale of land in the Scheme, as these roads were part of the land development and subdivision of farms.

QCA Analysis

SKM advised the Authority that the road network servicing farmland was not required for the provision of water infrastructure services. An agreement between SunWater and the Burdekin Shire Council regarding some of these roads states that they *'are additional to irrigation and drainage facilities'*. For this reason, the Authority considers that general access roads to irrigation farms should not form part of the asset base for pricing purposes, but should be considered as part of the initial land development.

Flood Mitigation Assets

The construction of the Burdekin Falls Dam provides flood mitigation benefits to properties downstream of the Dam. Whilst the 1980 report to Parliament noted that these benefits would accrue to development currently existing at that time, the report also estimated the benefits to both existing and new properties.

However, the provision of flood mitigation services does not affect the nature of the assets required for the Scheme or their cost, as these benefits are incidental to those provided by assets within the optimised asset base. That is, no additional infrastructure is required to provide these benefits.

Accordingly, the Authority considers there is no case for adjusting asset values to reflect flood mitigation benefits.

Stakeholder Comment

In their final submission, MDCC noted that the Authority contended that flood mitigation services provided by the Burdekin Falls Dam were an *'incidental by-product of the main objective of the scheme'*. MDCC contended that flood mitigation was a function that supported the initial government decision to progress the dam and should not be dismissed without a quantitative value being placed against it, that is, it was part of the decision making process.

BRIAC also raised a number of arguments supporting the contention that flood mitigation benefits should be taken to account in determining the asset base for pricing purposes, assuming that the Authority did not accept their argument that the whole asset base was a sunk cost.

QCA Analysis

The 1980 Parliamentary Report indicates that the principal objectives of the Scheme were to provide adequate water supplies for the irrigation of sugar-cane and to provide water supply for further agricultural, and urban and industrial development (page 2). The Report does, however, list the benefit of flood mitigation as a benefit of the Scheme as distinct from secondary benefits

associated with the Scheme. These distinctions between objectives, benefits and secondary benefits do not assist in determining whether the existence of flood mitigation benefits was to be recognised in pricing policy. No guidance on this matter is evident.

The approach adopted in the Draft Report is consistent with current government approaches to CSOs whereby the government is only prepared to provide a CSO if additional costs are incurred which would not have been incurred by the service provider for its commercial purposes. In this case, no additional costs were incurred.

The alternative interpretation, promoted by MDCC and BRIAC, is that the flood mitigation is one benefit of the Scheme, as is the provision of water services, and that costs should be allocated according to the benefits envisaged. The Authority has not attempted to calculate the flood mitigation benefits of the Scheme or, for that matter, the total benefits of the Scheme. However, the Authority notes that the total benefits of the Scheme (in terms of gross value of production) were estimated in the 1980 Report at \$297 million annually. In that same report, the benefits of flood mitigation were estimated at a maximum of \$0.8 million per annum, or less than 0.3% of the total scheme benefits. On this basis, even if flood mitigation benefits were taken to account, the maximum revenue requirement for the Scheme would reduce by less than \$50,000 in some \$19 million.

However, as indicated, the Authority considers that flood mitigation is an ancillary benefit which incurred no additional cost and, therefore, should not be allocated any share of the costs.

Recreational Assets

SunWater provides recreational assets at the Burdekin Falls Dam, including picnic facilities, boat ramps, amenities blocks and public safety infrastructure.

Where assets are provided purely for recreational purposes, the costs of these assets should be recovered from the users of those assets, provided this is practical and cost-effective. However, the costs of implementing 'user-pays' charging at the Burdekin Falls Dam site is likely to outweigh the revenues collected.

A significant portion of these assets is provided for purely recreational purposes. The cost of purely recreational assets provided by SunWater at the Burdekin Falls Dam was estimated by SKM to be \$1.5 million. No revenues are received by SunWater for these facilities. However, as these recreational assets were not included in the Arthur Andersen valuation, no further adjustment is necessary.

However, part of the capital involved in the provision of recreational assets at the Burdekin Falls Dam is also required for the safe operation of the site and to manage site access. The estimated value of these site management assets is around \$0.7 million. These costs have been incorporated into the asset base.

Land and Resumption Costs

A water business typically holds land for buildings, pipelines and channels, and pumping facilities as well as the area submerged and adjacent to storages.

SunWater owns land associated with the Burdekin Falls Dam, associated recreational areas, pump stations, and reservoirs. Channels are located along land resumed at the time of construction.

The appropriate method for valuing land and easements is currently the subject of much discussion Australia-wide. Options are to:

- use historic cost;
- use historic cost indexed for inflation; or
- use the market value of land.

Other Jurisdictions

The Australian Competition and Consumer Commission (ACCC) (2001) expressed a preference for an ODV approach for valuing easements, but concluded that, in balancing the need for an adequate rate of return on investment and the need to avoid price shocks, indexed historical cost in valuing Sydney airport land and easements was appropriate.

IPART (1999d) argued that easements apply in perpetuity, are rarely replaced and that the use of replacement costs would result in price shocks. IPART concluded that actual cost should be used rather than replacement cost.

Stakeholder Comment

SunWater proposed that the market value of land be included in the asset base. SunWater also submitted that additional costs needed to be incorporated in the asset base to reflect:

- inundated land for the Burdekin Falls Dam and weirs \$1.68 million
- land resumption costs for the Burdekin Falls Dam \$7.70 million
- land under channels, drains and roads and other land \$14.1 million

In addition, SunWater indicated that account needed to be taken of some unspecified BRIA land resumption costs.

BRIAC argued that the value of land used for water infrastructure should be valued at zero, as this land has no alternative use.

In its comments on the Draft Report, BRIAC also argued that it was inconsistent for the Authority to include land as a cost to the Scheme while not taking account of the benefits of flood mitigation.

QCA Analysis

Land is a necessary component for the storage and delivery of water and, to the extent that it is relevant to current and forecast demand, should be incorporated in the asset base.

SKM reviewed SunWater's submission regarding land and concluded that, based on estimated historic cost indexed for inflation:

land and land resumption costs total \$14.8 million. SKM were unable to reconcile this land value with the lower figure proposed by SunWater; and

the land under channels totals \$2.5 million. This amount broadly aligns with more recent submissions by SunWater. The remainder has been accounted for in the development costs of the Scheme, or related to land under drainage infrastructure.

The Authority has accepted the advice of SKM and included in the Scheme's DORC valuation \$17.3 million relating to the value of land underlying Scheme assets and costs relating to its acquisition/resumption.

With respect to BRIAC comments on the Draft Report, there is no inconsistency of treatment. Land was resumed at a cost to the Scheme while the achievement of flood mitigation benefits did not impose any additional cost.

Other Indirect Costs

Construction of the Burdekin Falls Dam required electricity and telephone connection to the dam site, and involved other indirect costs.

SunWater submitted that the costs of providing electricity and telephone connection to the Dam, amounting to \$2.4 million were necessary for construction purposes. SunWater estimated other costs such as the establishment of temporary site camps and permanent site facilities, site survey and investigations and detailed designs at \$9.4 million.

QCA Analysis

SKM considered that the additional indirect costs that SunWater proposed should be included in the asset base were reasonable, and these were therefore incorporated in the asset value. Refer to Table 4.4.

Table 4.4: Summary of adjustments to Arthur Andersen's DORC

	<i>\$ million</i>	<i>\$ million</i>
Arthur Andersen DORC valuation for total Scheme		393.9
plus adjustment for unit rates and indirect costs	8.6	
plus adjustment for interest capitalisation	13.5	
Arthur Andersen DORC adjusted for unit rates and interest capitalisation		416.0
plus working capital	0.6	
plus Mingela to BFD Road	16.1	
plus site management assets	0.7	
plus land and resumption costs	17.3	
plus electrical and communications	2.4	
plus site camps and survey costs	9.4	
Arthur Andersen DORC adjusted for unit rates, interest capitalisation and additional assets		462.5

The valuation of \$462.5 million (before optimisation) is comprised of \$271.4 million for storage assets and \$191.1 million for distribution assets.

4.5 Optimisation

A key issue in establishing DORC is the way in which optimisation is addressed. Optimisation seeks to account for inappropriate scale, configuration and technology in present assets, relative to those assets that would be developed today to meet present and expected future demand.

Approaches to optimisation range from a “greenfields” approach, which assumes that assets would be replaced without any constraints imposed on the configuration or type of assets constructed, to alternative “brownfields” approaches that might be constrained by factors such as the pattern of development of other infrastructure.

One variation on “brownfields” optimisation is “incremental optimisation”, which is based on the premise that the existing assets would be replaced using fundamentally the same configuration as is presently in place, with adjustments only to the type of assets (improvements in asset technology, for example) and scale to match the desired level of service provision. The focus of incremental optimisation is on redundant assets, over-engineering and excess capacity.

Where optimisation has been adopted by regulators (including the Authority), it has generally been in the form of incremental optimisation.

In assessing the “optimal” value of the Burdekin Scheme assets, SKM’s approach was to:

- assess the likely level of demand; and
- determine what configuration/scale of assets was necessary to provide a sufficient level of services to meet this demand.

Demand Projections

The Ministers’ Direction required the Authority to use the demand forecasts used in the rural water price setting process. These cover the five years from 2000-01 to 2004-05.

However, to appropriately assess the optimised value of the Burdekin Scheme assets, it was necessary also to consider potential growth or changes in demand into the future.

Stakeholder Comment

SunWater submitted that, as a result of additional commercial projects forecast to come on line from 2005-06, demand beyond 2005 could dramatically increase and could result in the use of all available water in the Dam.

BRIAC and the QFF stated that there was considerable excess capacity within the Dam and no foreseeable future demand that would result in this capacity being utilised.

In responding to the Authority’s Draft Report, the BRIAC has claimed that the Authority has not acknowledged the implications of the Burdekin scheme now servicing a fewer number of farmers (and a smaller irrigated area) than was originally anticipated.

BRIAC also claimed that the Authority did not give credit for benefits from enhanced security of Townsville’s water supply.

QCA Analysis

As directed, the Authority has used the demand figures used in the price paths. These apply until 2004-05 and were considered to be reasonable by SKM, who also considered the losses that would occur with the delivery of these volumes. However, in order to give consideration to the appropriateness of current capacity, it was necessary to estimate demand for water beyond the current price paths.

SKM assessed the risks associated with the commercial projects proposed by SunWater, reviewed and updated industry sector information and, after considering the materiality of demand related to certain projects, developed a risk profile for each material project.

These forecasts indicate that it is unlikely that there will be any increase in demand for water from within the BRIA for the purposes of sugarcane production over and above the full utilisation of existing allocations held by irrigators.

Some increase in demand for water is expected to come from urban/industrial customers, but this would be satisfied by the existing allocation held by NQWater. As the NQWater allocation is already subject to a contractual right, SKM considered it appropriate to include this volume in the “likely” demand scenario, although it recognised that it is not presently being used.

SKM’s analysis of likely demand represents the most recent and comprehensive assessment available to the Authority. It incorporates updated information on demand from existing and new customers. Accordingly, the likely demand scenario developed by SKM has been used by the Authority as the basis for its assessment (see Table 4.5, below).

These estimates are consistent with the price paths, and include losses as specified in SunWater’s IROL. Demand by BRIA and non-BRIA users features in Table 4.5.

It is noted that, unlike the case of many urban facilities where high reliability water is required by industrial customers, the issue of a capacity cushion does not arise for irrigation provided at medium reliability with any shortages in capacity translating into reduced volumes supplied to irrigators.

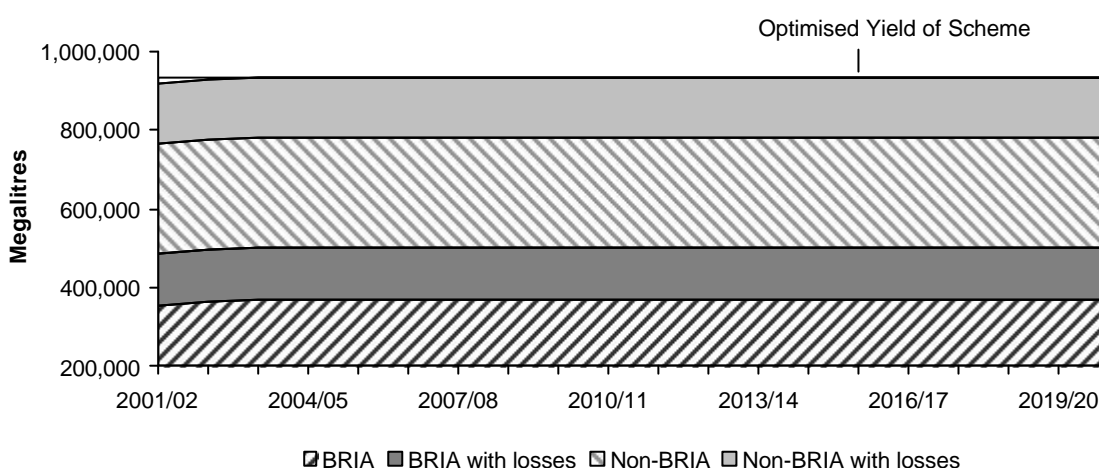
The Authority’s optimisation approach under DORC provides that only assets appropriate to anticipated demand are included in the asset base of the Scheme. Assets constructed to service demand that has not eventuated are not included in the asset base for pricing purposes. This is consistent with the outcome of competitive markets, the benchmark for efficient service delivery.

The Authority’s allocation of assets to BRIA reflects BRIA’s share of the water allocations established under the current IROL (and which in turn reflects estimates of current requirements). With respect to Townsville’s water supply, the Authority has recognised the water allocation held by NQ Water and has removed those assets related to that supply from the asset base relevant to BRIA irrigators. In doing so, allowance was made for the greater certainty attached to some of the NQ Water allocation.

Table 4.5: Likely Demand Scenario for BRIA (ML)

	2001-02	2002-03	2003-04	2004-05	2009-10	2014-15	2020-21
Channel*	281,400	291,400	297,400	297,400	297,400	297,400	297,400
River*	32,640	32,640	32,640	32,640	32,640	32,640	32,640
Other*	40,779	40,779	40,779	40,779	40,779	40,779	40,779
BRIA losses	132,971	132,971	132,971	132,971	132,971	132,971	132,971
Total BRIA with losses	487,790	497,790	503,790	503,790	503,790	503,790	503,790
Total Non-BRIA with losses	429,416	429,416	429,416	429,416	429,416	429,416	429,416
Total	917,206	927,206	933,206	933,206	933,206	933,206	933,206

* These figures do not include losses

Figure 4.2: Demand by Category of User

Optimisation of Storage Assets

The major storage assets of the Scheme are the Burdekin Falls Dam and the Clare Weir. In addition, minor storage services are provided by a series of weirs on the Burdekin River (the Gorge, Blue Valley and Clare Weirs) and Haughton River (the Giru and Val Bird Weirs). The value of these minor storage services is incorporated in distribution assets. The replacement cost of the Burdekin Falls Dam and the Clare Weir was estimated by Arthur Andersen at \$212.8 million and by SKM (taking into account the adjustments referred to in section 4.2) at \$228.0 million.

The IROL held by SunWater provides for total water allocations of some 1.12 million ML. This includes 184,241 ML of unused medium priority water being held by SunWater as an Interim Water Allocation. The total capacity of the Burdekin Falls Dam is 1.86 million ML.

SKM's report to the Authority suggested there was little likelihood that this surplus capacity would be drawn down by additional demand in the foreseeable future. Accordingly, SKM sought to value the "optimal" configuration of storage assets, taking into account all envisaged demand, including foreseeable demand into the future.

This analysis suggested that a dam with a Full Supply Level (FSL) of 152.54m (AHD)²⁷ would be sufficient to meet present and future demand. Such a storage would provide for an annual yield of 933,000 ML from 2004-05. The present dam has an FSL of 154m (AHD).²⁸ The reduction in DORC attributable to this smaller main embankment was estimated by SKM at \$8.4 million.

SKM also noted that an oversized saddle dam was included in the Scheme for ready incorporation of a hydro-electricity power station, as was initially proposed for the Scheme. SKM has optimised out the excess capacity contained within this structure as there appears to be no prospect for such a facility within the timeframe considered by this analysis. The effect of the reduction in size of the adjacent saddle dam is to reduce the DORC by a further \$15.0 million.

Finally, SKM noted that the construction of the Dam has resulted in the redundancy of several weirs in the Scheme, including the Gorge Weir. The value of these weirs has therefore been excluded from the optimised valuation. This adjustment was made in the previous Arthur Andersen valuation and consequently no further adjustment is required. A summary of all adjustments to storage assets appears in Table 4.6.

Table 4.6: Valuation of Storage Assets

		<i>\$ million</i>	<i>\$ million</i>
Arthur Andersen DORC			212.8
plus	adjustment for unit rates and interest capitalisation	15.2	
Arthur Andersen DORC adjusted for unit rates and interest capitalisation			228.0
plus	share of related costs		
	Mingella Road	16.1	
	land and resumption costs	14.8	
	detailed design and site surveys	9.4	
	electricity and communications	2.4	
	site management costs	0.7	
Arthur Andersen DORC adjusted for unit rates, interest capitalisation and additional costs			271.4
less	excess demand capacity	(8.4)	
	oversized saddle dam	(15.0)	
SKM DORC for storage assets			248.0

On the basis of SKM's analysis, the Authority accepts that the DORC value of the Burdekin Scheme storage assets is \$248.0 million.

²⁷ Australian Height Datum, a measure of vertical height above a historically determined mean sea level which has an AHD of zero.

²⁸ The Authority notes the Department of Natural Resources and Mines is currently undertaking further hydrological analysis to confirm the annual supply yield for the Burdekin Falls Dam. For the purposes of the present analysis, the Authority has assumed that the storage can service the entire IROL annual allocation of 1,117 GL.

Distribution Assets

Distribution assets in the Burdekin Scheme comprise several main distribution channels as well as 400km of reticulation channels to individual farms. Other relevant assets include pump stations and metered outlets. The Arthur Andersen DORC estimate of the distribution assets is \$181.1 million.

Stakeholder Comment

BRIAC stated that there was significant over-engineering of the channels, particularly the use of above ground channels. It also contended that, while part of the rationale for above-ground channels was to provide sufficient head for irrigation, irrigators were pumping anyway. Therefore, channels should be below-ground where feasible.

In its final submission, BRIAC also points out that SunWater's comments that "Irrigators as part of the farm inspection committee argued strongly for the provision of above ground channels at the time of the development of the Scheme and that these channels should be included in the optimised asset base" are only partly correct. Had irrigators been aware of a requirement for a rate of return as a component of their water charges they would have re-evaluated their requirement for above ground channels and would have demanded that the design and infrastructure for the total BRIA scheme be downgraded to a more affordable system. Therefore, the optimised asset valuation for the scheme the irrigators would have accepted knowing that they were required to provide a return on the asset base would have been greatly reduced from the asset valuation irrigators are now required to accept.

SunWater has submitted that, as in-ground channels were required to be lined to minimise seepage, it was cheaper to have channels constructed at above natural surface level than below-ground storages. SunWater stated that the raised channels provide water pressure to irrigators at a minimum head of 450 mm (a measure of pressure equivalent to the distribution channel being 450 mm above the irrigation farm). This reduces pumping costs for farmers. SunWater stated that the original decision to provide this level of pressure was partly due to consultation with local farmers and other representatives on a Farm Inspection Committee. However, SunWater has noted that most irrigators are now relying on pumping to some degree, due to subsequent changes in farm management practices.

SunWater also submitted that, because of the involvement of irrigators (through the Farm Inspection Committee) in the decision to use raised channels, it would be inappropriate to optimise the channels to below-ground channels due to:

- moral hazard implications - these may arise as customers of regulated infrastructure will learn that they will be able to invoke regulatory processes such as optimisation to avoid the financial consequences of their past recommendations on service standards;
- dynamic cost implications - there will be little incentive for SunWater to meet customers' requirements in the future where there is a regulatory risk that these costs may not be recovered due to future regulatory decisions; and
- regulatory risk - perceived higher risks for future investments in regulated infrastructure would be reflected in higher rates of return being required than otherwise.

Davco Farming submitted that the distribution channels within the Scheme were poorly designed and were too expensive to build and maintain.

In commenting on the Draft Report, SunWater submitted that SKM had ignored the historical development of the pump station and had in fact punished SunWater for adopting innovative and world-first technologies.

SunWater claimed that, by optimising out part of the pumping costs as a result of the availability of the new technologies, the Draft Report sent the wrong signals to asset developers contemplating breakthrough technologies as it introduces significant regulatory risk.

SunWater also asserted that optimisation should be based on the circumstances at the time of construction of the assets rather than with perfect hindsight without due regard to the reasonableness of the decision at the time.

SunWater also did not consider that the optimised solution suggested by SKM would in fact be cheaper than the existing arrangement and considered that SKM's capital cost estimates for certain pumps (to replace the existing dry-well pumping station) appeared to be low, based on the cost of recent installations of equivalent pumps by SunWater. SunWater also claimed that the optimised solution would incur higher operating costs and maintenance costs, and be exposed to far greater risk of damage from floods.

QCA Analysis

With respect to the arguments raised by SunWater pertaining to the representation of irrigators on the Farm Inspection Committee, the Authority understands that the potential cost implications for water pricing were not considered as part of the decision making process. That is, irrigators assumed that any costs would not affect their price for water. Under these circumstances, concerns regarding moral hazard, dynamics cost implications and regulatory risk do not apply.

After analysing topography and soil types in the Burdekin Scheme, SKM advised that a greater proportion of channels could have been more cost-effectively placed in-ground. This reduced the relevant channel assets value by \$1.5 million.

SKM also considered irrigators' concerns regarding over-engineering of the dry-well pump at the Haughton Main Pump Station. Irrigators claim that these relatively expensive assets should not be included in an optimised asset base as the concrete submersible pumps could meet irrigators' demand. SKM noted that the submersible pumps may have to be shut down during flood events above 6,000 m³/second to avoid damage from movement of river bed sediments.

SKM investigated the likelihood of such flood events and whether there was a possibility that areas within the BRIA would still require water from the Scheme. SKM concluded that there was a need for some form of pumping system that would be operable during a flood event, but that cheaper contemporary alternatives were available.

With regard to SunWater's comments on the principles underlying optimisation, the Authority accepts that optimisation introduces a regulatory risk when viewed against a no regulation scenario. However, under competitive market conditions, a risk equivalent to optimisation exists as competitors could introduce the same (new) technology to bridge any competitive gap. That is, optimisation, if appropriately applied, mimics the outcomes the service provider would face in a competitive market. In this regard, the Authority notes that the pumps were installed in 1992, and it is reasonable to assume that any competitive advantage would have expired in a competitive market place (in other words, optimisation would have occurred).

After a consideration of cost and practicality, SKM revised its original configuration of the pump station slightly, revising the estimate of its optimised cost from \$4.8 to \$4.0 million.

SKM also concluded that it is unlikely that the proposed arrangement will result in significantly higher operations and maintenance costs compared to the current configuration.

SKM's analysis also concluded that upstream control of system flows would have allowed for further cost efficiencies in regulating water flows through the use of 'overshot' regulators as opposed to the existing water regulators used in the Scheme. Adoption of this technology would reduce the DORC by a further \$2.2 million.

Finally, SKM considered that there was significant spare capacity in the Elliot Main Channel, with only around three percent of the channel's capacity being used. SKM concluded that supply via a smaller channel along the existing alignment would be more efficient, with a consequent reduction in the asset value of \$10.3 million.

After adjustment by SKM for unit rate differences and changes in indirect cost factors, the Arthur Andersen estimate of distribution assets becomes \$188.0 million. Other related assets that need to be incorporated include land resumption costs and working capital, which total \$3.1 million (Table 4.7 refers).

Allowing for optimisation adjustments, the Authority has determined the DORC value of the Burdekin Scheme distribution assets to be \$173.1 million (Table 4.7 Refers).

Table 4.7: Valuation of Distribution Assets

	<i>\$ million</i>	<i>\$ million</i>
Arthur Andersen DORC		181.1
plus adjustment for unit rates	6.9	
Arthur Andersen DORC adjusted for unit rates		188.0
plus share of related costs		
land and resumption costs	2.5	
working capital	0.6	
Arthur Andersen DORC adjusted for unit rates and additional costs		191.1
less greater proportion of channels below-ground	(1.5)	
over-engineering of dry-well pump	(4.0)	
efficiencies in regulating water flows	(2.2)	
Elliot Main Channel spare capacity	(10.3)	
SKM DORC for distribution assets		173.1

On-farm water storages

An alternative water storage and distribution option is for individual farms to capture and store overland (non-river) water flows, in off-stream storages.

Stakeholder Comment

Davco Farming estimated the costs of water captured and stored in on-farm water storages is approximately \$100 per ML, depending on the specific site.

QCA Analysis

The Authority understands that the development of on-farm water storages, as suggested by Davco Farming, would require each individual farmer to gain the appropriate approvals to establish on-farm storage, to incur costs in developing site specific designs, and, in any event, may not be technically feasible for all current irrigators. There are also statutory limitations on the depth of off-stream storages, meaning that large volume storages consume large areas of land. The Authority also understands that, pursuant to the present development of a draft WRP for the Burdekin Basin under the *Water Act 2000*, there is currently a moratorium on commencing the construction of works which are intended to take or interfere with overland flows.

Furthermore, the Authority notes that, if on-farm storages were cheaper and more effective than obtaining water from the Scheme, on-farm storages would form the prevailing source of irrigation water in the BRIA. Such developments did not occur prior to the moratorium being imposed.

Summary of Optimisation

A summary of the optimisation process, compared against the Arthur Andersen depreciated replacement cost, is shown below in Table 4.8.

Table 4.8: Summary of Optimisation

	<i>\$ million</i>	<i>\$ million</i>
Arthur Andersen DORC valuation for total scheme		393.9
Plus unit rates, interest capitalisation and additional assets		68.6
Adjusted Arthur Andersen DORC valuation for total scheme		462.5
Less SKM optimisation		41.4
SKM final DORC valuation for total scheme - comprising:		421.1
SKM DORC for storage assets	248.0	
SKM DORC for distribution assets	173.1	

4.6 DORC Value attributable to BRIA

The Authority's DORC valuation as at October 2000 is summarised in Table 4.8. In the first year of the price path, the DORC valuation is estimated at \$421.1 million. However, some of these assets are used to provide water to other users.

The DORC value of assets relevant to this price investigation should include only those assets that are used exclusively by BRIA irrigators, plus a share of "common" assets that also provide services to non-BRIA irrigators and other users across the Scheme.

The allocation methodology adopted by the Authority retains the existing Scheme "segments" which underpin the present gazetted prices. The Scheme is segmented into:

- *channel assets*, including water supply assets associated with taking water from the Burdekin River and distributing it via the channel system to customers on both the left

and right banks of the river. It includes the pump stations on the river and a component of the Clare Weir;

- *river assets*, including water supply assets other than the channel assets associated with taking water direct from the Burdekin River. This segment includes riparian pumpers and the North and South Water Boards; and
- *other assets*, including assets associated with supply to the Haughton River for riparian pumpers, and supply to the Giru and Reedbeds systems to support groundwater use. This includes the remaining share of the Clare Weir not allocated to channel assets.

Common assets include the Burdekin Falls Dam, the Clare Weir, and the Haughton Main Channel. These assets were allocated across the users of these assets according to the following methodology:

- the DORC valuation for the Burdekin Falls Dam and Clare Weir was allocated between Channel, River and Other users based on proportional water allocations specified in the IROL (see Table B.4 in Appendix B);
- the DORC valuation for the Haughton Main Channel was allocated between Channel and Other users based on proportional water allocations specified in the IROL. Other users in the Scheme use water from a watercourse supplemented from the Haughton Main Channel; and
- high security water allocations were “grossed up” by a factor of 1.8 to account for the higher level of supply security attributable to this allocation. This factor was determined using the available hydrological modelling of the Scheme by the Water Reform Unit (WRU) (2000).

The value of assets in the Channel, River and Other segments, respectively, were then allocated to either “BRIA” or “non-BRIA” users based on proportional water allocations specified in the IROL. The outcomes of this allocation methodology are outlined in Table 4.9 below.

Table 4.9: Allocations of Assets to BRIA

<i>Users</i>	<i>DORC (\$m)</i>	<i>% Attributable to BRIA</i>	<i>DORC for BRIA Assets (\$m)</i>
Channel	329.2	68.8	226.6
River	73.3	17.5	12.8
Other	18.6	96.0	17.8
Total	421.1	61.1	257.2

After allocation of common costs across all users, the Authority concludes that the appropriate DORC valuation for the BRIA assets is \$257.2 million.

4.7 Incorporation of Capital Contributions in DORC

The portion of capital on which a rate of return could be charged, if deemed appropriate, is the capital not accounted for by any capital contributions.

However, before this can be calculated, the treatment of capital contributions in relation to optimised and depreciated assets needs to be considered.

Grants

Stakeholder Comments

BRIAC submitted that, if grants are counted towards the asset base, they must also be counted as income and offset against the revenue required of users.

QCA Analysis

Had the Authority recognised government payments as capital contributions, one means of treating the contribution would be to incorporate them in the asset base and to reduce the price by a consistent amount, as BRIAC have suggested. As noted above, however, the Authority has not recognised the government payments as capital contributions.

Treatment of Capital Contributions made in Respect of Optimised Assets

An issue arises as to whether capital contributions should be optimised when the asset towards which the contribution was made is optimised.

QCA Analysis

This issue is essentially about who bears the risk of optimisation. If a capital contribution is not optimised when an asset is optimised, the asset owner bears the full risk of optimisation. On the other hand, if the capital contribution is optimised, the users of the asset share the risk of optimisation with the owner.

In principle, there is no reason why different capital contributions may not be treated differently depending on the nature and cause of the asset optimisation. So far as the Burdekin Scheme is concerned, the key areas of optimisation have been outlined above and involved redundant assets, over-engineering and excess capacity. As the asset owner was best placed to manage these risks, it is considered that the asset owner should bear the full risk of that optimisation.

October 2000 Values and Inflation

Stakeholder Comment

BRIAC has stated that, by revaluing both assets and capital contributions to October 2000, the Authority has exaggerated the difference between irrigators' capital contributions and the cost of the scheme, that the difference is not unaccounted for capital and further that an increased asset value is not a contribution by anyone.

QCA Analysis

Due to inflation and the time-value of money, dollars expended in different years are not directly comparable. As the date the current price paths were set was in October 2000, the Authority has brought all values to this date for comparison purposes.

The Authority recognises that the absolute difference between the asset values and contributions will be larger, however, the real difference will remain unchanged.

The Authority determined the total value of assets and capital contributions as at October 2000 in a consistent manner. Under the DORC methodology, the total value of Scheme assets was indexed to October 2000, optimisation adjustments were applied to those values, and

depreciation was deducted. In a similar manner, capital contributions were indexed to October 2000 and depreciated in line with the assets to which they were attributed.

Whilst this will result in an increase in the absolute value of ‘unaccounted for capital’ than if the date of evaluation was March 1980, any inflationary increase in the asset base is taken into account in the calculation of maximum allowable revenues.

The Authority accepts that rates of return incorporate inflation expectations but notes that market prices are based on the prevailing value of assets at any point in time.

Allocation of Capital Contributions

The capital contributions outlined in chapter 3 were depreciated on the same basis as were the assets to which the contributions related. They were then allocated to the various users on the same basis as were the assets to which the capital contributions related. This allocation method was outlined in Section 4.6 above. Details of the resulting allocations are set out in Tables B.5 and B.6 in Appendix B. As those tables indicate, the capital contributions attributable to the BRIA amounted to \$56.6 million.

Capital Not Accounted for by Capital Contributions

On the basis of the asset valuation outlined in previous sections and taking account of the capital contributions above, the capital attributable to the BRIA not accounted for by capital contributions attributable to the BRIA was \$200.6 million as at October 2000, as shown in Table 4.10.

Table 4.10: Capital Not Accounted for by Capital Contributions

<i>BRIA Users</i>	<i>DORC for BRIA Assets (\$m)</i>	<i>Capital Contributions to BRIA Assets (\$m)</i>	<i>Remaining Capital (\$m)</i>
Channel	226.6	51.8	174.8
River	12.8	1.6	11.2
Other	17.8	3.2	14.6
Total	257.2	56.6	200.6

4.8 Economic Value

Previous Estimates

In June 2000, prior to the corporatisation of SWP and the formation of SunWater, an estimate of the value of SWP was prepared for the Queensland Government. The purpose was to determine the value of the assets transferred from Government to the corporatised SWP. The value of SWP was determined to be the NPV of the free cashflows of SWP discounted at a rate of return appropriate for the riskiness of the cashflows.

Key parameters to the valuations were:

- forecasts of free cashflows for a period of 20 years and an assumption that cashflows continued in real terms in perpetuity thereafter; and
- a nominal post-tax WACC of 8.89%. A 100% equity capital structure was assumed with dividend imputation of 100%.

On this basis, an EV of \$210 million for all of SunWater’s water infrastructure assets was established. This value was consistent with appropriate accounting standards and was audited

by the Queensland Audit Office as part of the process of preparing the first financial statements for SunWater. The valuation was also endorsed by the Queensland Government during the corporatisation process for SunWater.

Stakeholder Comment

BRIAC submitted that the value of the Scheme had been revealed through auction sales of land. Thus, BRIAC argued that the value of the Scheme had been determined by the market and irrigators should not be asked to pay any additional amounts for Scheme services.

QCA Analysis

Unless an asset has a higher NRV, the EV of an asset is essentially the NPV of expected revenues and costs. These expectations are a function of many factors including the business strategy of the service provider and related commercial pricing practices, the ability of its customers to pay, the expected productivity gains that the entity anticipates that it and its customers can achieve over time, and the relative market power of the service provider and the customers. Accordingly, estimates of EV can vary significantly depending on the assumptions applied. In the market, they are determined by prevailing expectations.

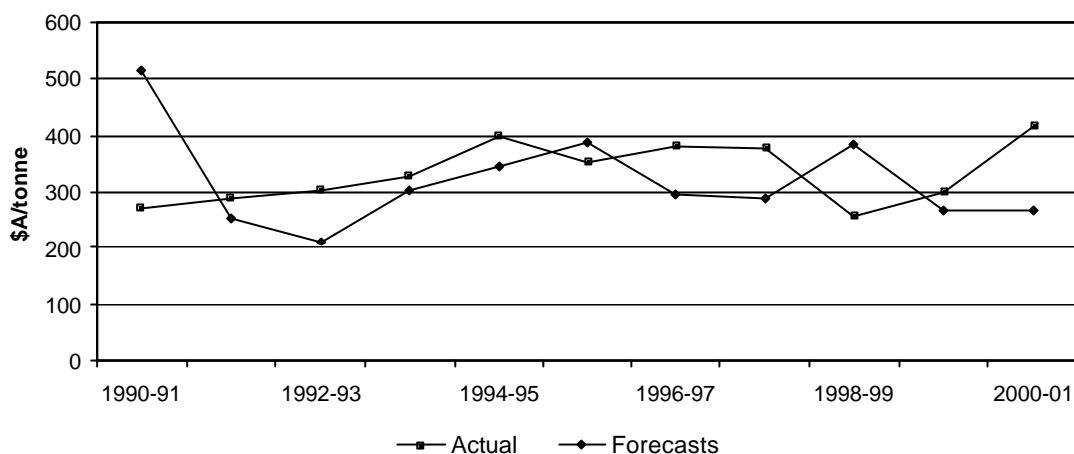
An issue then arises as to how to calculate the EV of a monopoly service provider with regulated prices.

Whilst the calculation of an EV for a business with existing regulated prices can provide useful information, if this value is used for regulatory asset valuation purposes it will entrench existing prices. Depending on the expected capacity of users to pay, this may not be appropriate, as either users may not be able to pay the current prices in perpetuity or the service provider may be able to seek to increase prices.

Expected Capacity to Pay

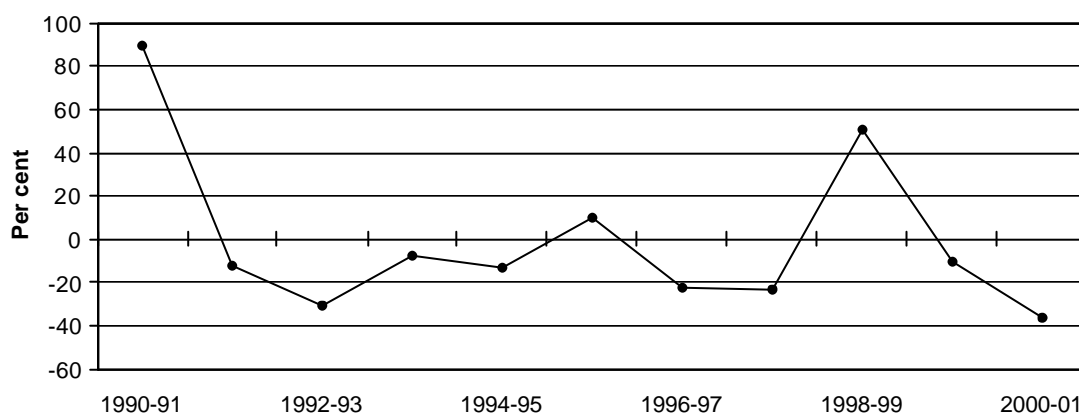
The expected capacity of users to pay can be estimated by measuring the NPV of users' expected revenues and costs (that is, the users' EV). For commodity markets, revenues are dependent on prices that are set on world markets. These prices vary considerably according to international demand and supply as do expectations of future prices. For example, ABARE's two-year projections of the sugar price varied from the actual price by up to 90% as shown in Figure 4.4. Forecast values appear in Figure 4.3.

Figure 4.3: Comparison of ABARE’s Two-year Ahead Forecasts for the Raw Sugar Price and the Actual Price Achieved



Source: ABARE, Agriculture and Resources Quarterly, 1990 to 1993; Australian Commodities: Forecasts and Issues, 1994 to 2002.

Figure 4.4: Percentage Error of the Two-year Forecasts for the Raw Sugar Price



Source: ABARE, Agriculture and Resources Quarterly, 1990 to 1993; Australian Commodities: Forecasts and Issues, 1994 to 2002.

As a result of the variability in world prices, and the often unrealised price expectations, estimates of users’ expected capacity to pay should be treated with caution.

Nevertheless, the Authority considers that estimation of the expected capacity of users to pay the gazetted prices is an important factor in assessing those prices.

As a result, the Authority has estimated the expected capacity of users to pay as at October 2000 by the calculation of the EV of the users. Where this value is less than the DORC value of assets, further consideration as to the sustainability of prices is required.

In doing so, it is recognised that it is not only the existing users that are relevant for this purpose. Prospective competing future users also need to be taken into account. Sugarcane producers purchase 97.4% of the water supplied by SunWater to channel and river irrigators in the Burdekin Scheme. Other producers who purchase the remaining 2.6% of irrigation water

supply a range of products including mangoes, avocados, melons, pumpkins, capsicums and zucchini.

Given the dominant position of sugarcane producers, the Authority has focussed on the expected capacity of sugarcane producers to pay. It is accepted that this will underestimate the capacity of all users to pay, but probably only to a small extent.

For the analysis of users' capacity to pay at October 2000, the Authority considered:

- the international spot price for sugar prevailing at that time; and
- the latest ABARE projections of world sugar prices.

For comparative purposes, the Authority also considered the current gazetted price paths.

For the purposes of its assessment:

- channel and river irrigators were not differentiated as there was insufficient production data specific to growers in these areas;
- the costs of providing water service were based upon the lower bound estimates for the purposes of the gazetted prices; and
- the cost of sugarcane production was estimated by Economic Insights Pty Ltd on the basis of
 - ABARE surveys conducted in the Burdekin region from 1993-94 to 1995-96. The survey results are widely used by industry analysts and were used by the recent Hildebrand Inquiry into the sugar industry;
 - a Burdekin Sugar Benchmarking Analysis prepared by Macarthur Agribusiness for the Sugar Research and Development Corporation. These data are for the 2000-01 financial year based on information supplied by farm accountants; and
 - information provided by Davco Farming, one of the larger sugarcane farmers in the BRIA, based on the current cost of its own operations and estimates of other farmers in the BRIA.

Feedback was sought from the BRIAC, CANEGROWERS, industry accountants and Davco Farming, all of which considered the estimates to be representative of the likely cash costs of the average efficient BRIA farmer. For the purpose of this analysis, these costs were assumed to remain constant in real terms.

The estimates also provided for:

- a salary of \$40,000 for farm management services; and
- the maintenance of the service potential of the farm by including estimates of envisaged future capital replacement (\$1.25 per tonne).

The data sources were all relatively consistent and indicate that the average efficient sugarcane production cost in the BRIA is approximately \$26.25 per tonne of sugarcane produced. ABARE estimates of sugarcane production costs in other areas in Queensland range from \$29 to \$35 per tonne of cane, inclusive of a farmer's salary, as well as depreciation and interest (interest was not included in Economic Insights' estimates).

While these figures are based on the average efficient irrigator in the BRIA and there will be variations either side of the average, the ABARE farm survey data indicates the variance of costs in the Burdekin is relatively low (a standard error of 8%).

On the basis of the above information, estimates of the expected capacity of sugarcane producers to pay as at October 2000 are summarised in Table 4.12 below.

Table 4.12: Users' EV as at October 2000 (\$ million)

Based upon International Spot Price	775
Based upon ABARE Projections 1 ^a	421
Based upon Water Reform Unit price assumptions	209

^a Assumes that the final price projection is held constant in real terms for perpetuity.

^b Assumes that after the five year projections, the average of these projections is held constant in real terms for perpetuity.

Key assumptions underlying the EVs are:

- an international sugar spot price of \$423/tonne in October 2000 (Queensland Sugar Limited);
- ABARE projections of \$267/tonne in 2000-01, \$328/tonne in 2001-02, \$341/tonne in 2002-03, \$367/tonne in 2003-04, and \$406/tonne in 2004-05 (ABARE 2000);
- WRU forecast sugar price assumptions of \$225/tonne in 2000-01, \$266/tonne in 2001-02, \$307/tonne in 2002-03, \$330/tonne in 2003-04 and \$360/tonne in 2004-05;
- where the spot price is used, it is assumed that that price will continue in real terms in perpetuity. Where price projections over a number of years are used, it is assumed that the final price contained in the scenario will continue in real terms in perpetuity after the end of the period covered by the scenario;
- these sugar prices were then converted into a price received by growers in the Burdekin on the basis of a historic relationship. This was confirmed with irrigators representatives in the Burdekin Scheme; and
- a 30 year cashflow analysis was conducted, with a perpetuity factor applied at the end of this period to simulate the ongoing nature of the business.

In the absence of any empirical research on the matter, the discount rate used to estimate the EVs for irrigators in the above tables was the WACC determined for the Burdekin River Irrigation Area.

It should be stressed that not all of the expected capacity to pay as measured by the users' EV is available to meet water charges. Users also have capital invested on which a rate of return is desired. As such, the users' EV represents the capacity of users to pay a return on the capital of both SunWater and the users themselves. An obvious issue for consideration is the sharing of the users' EV between SunWater and the users.

The EVs outlined in this section compare with the EV of the assets at October 2000 based solely on current gazetted prices of \$36 million. This EV was calculated by assuming that the current

price path will be continued in real terms in perpetuity, with the cash flows also discounted by the WACC determined for the BRIA in Chapter 5.

This analysis indicates that, when they were set in October 2000, gazetted prices lay well within the expected capacity of irrigators to pay based on estimates of future sugar prices.

It should also be noted that the Authority's assessment of irrigators' expected capacity to pay as at October 2000 has not taken into account potential productivity gains that could have been expected from irrigators and the potential for other higher value crops to pay a higher price for water. This would further raise the estimate of expected capacity to pay at the time.

An alternative means of estimating the EV of the Scheme is through land values which are considered to reflect the purchasers' estimate of the future benefits associated with production. However, the Authority found that the relationship between projected and prevailing prices of sugarcane and land values varied significantly over the period for which relevant information was available and no meaningful conclusions could be derived from such an approach.

Stakeholder Comments

In their final submission, CANEGROWERS noted that the Authority 'provided no evidence as to why the spot price should be used to calculate EV.'

CANEGROWERS also disagreed with the Authority regarding its suggestion that productivity increases will keep pace with falls in real prices. CANEGROWERS submitted that long term real prices for most commodities tend to fall gradually over time typically by around 1-2% per year, and therefore questioned the concept of holding real prices constant between 2005 and 2030.

CANEGROWERS also outlined what it considered, with the benefit of hindsight, to be more plausible price forecasts as at October 2000.

CANEGROWERS also rejected the notion that the same rate of return applied to SunWater and irrigators.

QCA Analysis

In response to Canegrowers' comments on the use of the 1 October 2000 spot price, the Authority notes that it was one of three price forecast options used to demonstrate the sensitivity of EV to sugar prices. All three EVs exceeded DORC.

For the purposes of the assessment, the Authority has placed most reliance on the ABARE forecasts, as they are considered to be the most authoritative available.

The Authority has held agricultural prices and costs constant in real terms. The Authority could adjust prices as suggested, but should also then adjust costs for projected productivity increases – for example, the recent BCG Report to CANEGROWERS outlined that productivity increases of 11 to 23 per cent could be achieved by growers. The Hildebrand report also outlined productivity improvement that could be made in the industry.

In respect of CANEGROWER'S assessment of more plausible price forecasts that could be established with the benefit of hindsight, the Authority does not consider that it is valid to project prices from a particular date with information subsequently made available. The Authority's assessment reflects expectations at October 2000 as these formed the basis for the current price paths which are the subject of the assessment.

So far as the cost of capital for irrigators is concerned, the Authority notes that no empirical work has been done on this issue, even by ABARE. That is, there is no available information which would allow a comparison of the covariance of the net returns of irrigators (in aggregate) with net returns in the equity market, which is necessary to establish an appropriate equity beta for irrigators and then WACC.

In the absence of any reliable information, the Authority has considered the additional return that would need to be added to the WACC established for SunWater's investment in BRIA for the EV to fall below DORC, and further for the EV to fall below the asset value consistent with the current margin over lower bound prices. For the scenario considered most likely at October 2000, that is the ABARE forecasts, the WACC for irrigators would have to exceed that of SunWater by 5 percentage points (to 13.27%) to reduce the EV below DORC, and by 32 percentage points (to 40.27%) for EV to fall below that implied by current price paths.

Having regard to this factor, the Authority considers that, on the basis of ABARE price forecasts and any plausible estimate of the WACC for irrigators, DORC exceeds EV as at October 2000.

4.9 Conclusions

The Authority considers that, when they were set in October 2000, gazetted prices lay within the capacity of irrigators in the same area to pay based on the then estimates of future prices of sugar.

5. WEIGHTED AVERAGE COST OF CAPITAL

Summary

The Ministerial Direction requires the Authority to determine the appropriate weighted average cost of capital that could be incorporated in the price of providing water infrastructure services to irrigators in the Burdekin River Irrigation Area within the Burdekin Haughton Water Supply Scheme. The weighted average cost of capital (WACC) is the most common means of estimating the rate of return that compensates investors for the risks they face through ownership of assets.

The Authority considers that an appropriate estimate of the WACC for the provision of water infrastructure services to irrigators in the Burdekin River Irrigation Area within the Burdekin Haughton Water Supply Scheme was 8.27%, as at October 2000, on a post-tax nominal approach.

<i>Parameter</i>	<i>QCA Recommendation</i>
<i>Risk free rate (%)</i>	<i>6.17</i>
<i>Market risk premium (%)</i>	<i>6.00</i>
<i>Capital structure - proportion of debt (%)</i>	<i>50</i>
<i>Cost of debt margin (%)</i>	<i>1.80</i>
<i>Asset beta</i>	<i>0.35</i>
<i>Equity beta</i>	<i>0.40</i>
<i>Gamma</i>	<i>0.50</i>
<i>Tax rate (%)</i>	<i>0.30</i>
<i>Inflation rate (%)</i>	<i>2.5</i>
<i>Nominal post-tax WACC (%)</i>	<i>8.27</i>

5.1 Introduction

The rate of return is a forward-looking concept and represents the return expected by investors in capital markets for investments of a given level of risk. Before an investment is made, it represents the return that an investor requires in order to invest. After an investment has been made, it represents the rate used to discount anticipated cash flows to determine the current value of the investment (that is, the EV of the investment).

In competitive capital markets, the rate of return is determined by the forces of supply and demand for capital. However, for a regulated entity, this is not possible and the rate of return is established by the regulator. The regulated rate of return should be set at a level that is equal to what would be expected in a competitive market for that level of risk. If the allowed rate of return is too high, prices charged to end consumers will be above the level that is truly reflective of costs. On the other hand, if the allowed rate of return is too low, investment by asset owners will be constrained and the quality of service offered to customers may decline.

5.2 Issues in Determining the Rate of Return Framework

The rate of return for a particular business activity can be derived by calculating the appropriate WACC. WACC recognises that capital is provided from two sources, namely lenders and equity investors (owners or shareholders). It is calculated by adding the cost of equity funds, weighted by the proportion of equity funds to total assets, to the cost of debt, weighted by the proportion of debt to total assets.

The Capital Asset Pricing Model

The cost of attracting and retaining equity funds is not directly observable and must be estimated using data from securities markets. A number of alternative models have been developed to estimate the cost of equity funds, the most common of which is the CAPM.

The central concept of CAPM is that of undiversifiable risk (known as beta (β)). Essentially, the total risk of a business activity can be separated into two distinct classes of risk, being undiversifiable and diversifiable risk. Undiversifiable risk refers to the riskiness of an entity compared to the market as a whole. It can be calculated by a linear regression based on historic data.

The remaining risk is known as diversifiable risk. This risk can be removed by holding the asset or investment as part of a well diversified portfolio of investments. CAPM assumes that investors will not be compensated for the risk they can cost-effectively avoid through diversification. That is, it assumes that investors will only be compensated through the rate of return for risk that cannot be avoided through diversification. This is not to say that diversifiable risk is irrelevant for valuation purposes, because the rate of return (based on undiversifiable risk) is then applied to the business activity's expected cash flows. These expected cash flows should reflect the diversifiable risks.

Beta is a statistical assessment of the degree of undiversifiable risk associated with an asset or investment relative to the overall stock market. It assesses the systematic risk of the asset or investment, which is the risk that distinguishes it from the market as a whole. Since the beta of the market portfolio is one, a business activity can be identified as being more or less risky than the market as a whole. For example, an enterprise with a beta of one has undiversifiable risk that is perfectly correlated with the expected return for the market as a whole. The further a beta departs from one, the more its returns are expected to vary from those of the market as a whole. A higher beta is considered more risky, and a lower beta less risky, than the market as a whole.

Beta is used as an input to CAPM. CAPM also requires estimates of the risk free rate and the expected return on the market as a whole.

Other Jurisdictions

Most regulatory decisions in Australia over recent years have employed a CAPM/WACC approach to determine the rate of return and the cost of equity.

Stakeholder Comment

SunWater considers that the application of the WACC is appropriate and that the return on equity should be determined by applying CAPM.

BRIAC raised a number of arguments regarding the appropriateness of seeking a rate of return and against the use of WACC/CAPM. It argued that:

- a rate of return should not be sought as there should be no difference in Government charging mechanisms for bridges, roads, electricity infrastructure and irrigation schemes. They stated that it is arbitrary to say that taxpayer funds spent one way ‘owe’ a rate of return to government while taxpayer funds spent another way do not - just as arbitrary as it would now be for a government to go back and charge interest to past recipients of unemployment benefits or age pensions;
- applying a WACC on assets built by previous generations is like requiring a return to the British Treasury for roads built by Colonial Governors;
- there are two alternative approaches to determine the rate of return in respect of the BRIA: a traditional public finance approach or WACC utilising CAPM. BRIAC endorsed a traditional public finance approach. According to BRIAC, this equates to the actual interest rate charged on loans for the Burdekin Haughton Water Supply Scheme. In this context, BRIAC then submitted that, as SunWater does not have any loans in respect of the Scheme, the actual return on capital should be zero;
- the cost of equity capital to the Government is zero as it is raised through taxation and not in the capital markets;
- the public sector discount rate should be much less than the private sector discount rate because there are external benefits which need to be taken into account;
- the WACC/CAPM approach represents a notional cost of capital, not the actual cost of capital;
- the use of a private ‘equity premium’ in CAPM is irrelevant to public sector projects as governments only issue debt instruments and do not raise equity capital;
- using a benchmark based on private sector capital (CAPM) is not appropriate as SunWater are not subject to the same market disciplines including:
 - proper accounting treatments of all revenues, costs, asset values and depreciation;
 - the avoidance of simple inflation adjustments to asset bases, costs and revenues as this does not reflect likely competitive market outcomes;
 - debt costs would be actual, not notional; and
 - the business operator bears all the risk of asset ownership including optimisation and obsolescence; and
- it is economically irrational to seek a rate of return on taxpayer funded assets, as taxes are involuntary and not a form of equity raising on capital markets. The cost of capital for funds sourced through taxes is zero and governments should only seek a return on actual interest costs on debt funds.

The MDCC also submitted that the Authority’s comments regarding government equity investment not being costless should be reviewed in the context of the footbridge over the Brisbane River and the Lang Park upgrade.

QCA Analysis

The Authority considers that WACC should represent the opportunity cost of the capital invested in the assets. Important features of the opportunity cost of capital are that, at any given time:

- the cost of capital is a forward looking concept that reflects the expected return, relative to risk, that should be earned from investing in the asset; and
- the risk is derived from the expected characteristics of the cashflows produced by the asset relative to investments in alternative assets.

The Authority also considers that it is a matter of government policy how it funds its various infrastructure projects and whether it seeks to recover its costs from users of the infrastructure or from taxpayers generally. In this context, the Authority notes that full cost recovery (including a rate of return) is sought from the users of a variety of government infrastructure, including coal rail lines, electricity generation, distribution and transmission systems, some port infrastructure and some roads and bridges (toll roads and bridges). Users also pay fully for a variety of government recurrent services.

Furthermore, as outlined in the Addendum to Chapter 7, in the absence of any actual or implied contractual arrangements, the government has the power to alter existing pricing arrangements even though it may adversely impact on a particular individual or group of individuals.

The Authority notes that:

- compliance with the principle of competitive neutrality between the public and private sector requires the use of the same cost of capital for similar assets;
- the cost of capital relates to assets and is independent of the source of financing. Consequently, the financing of an asset from public rather than private sources will not alter the cost of capital that attaches to the asset. Rather, it is the riskiness of the asset which will determine the cost of capital;
- to ensure the efficient use of resources, investment decisions in the public sector should be based on the same cost of capital as used in the private sector for assets of the same risk characteristics;
- where a lower cost of capital is applied to an investment because of government ownership, inappropriate investment and consumption decisions will result; and
- government equity investments are not costless or riskless. The government does face an implicit cost or opportunity cost from funds invested in BRIA infrastructure and these investments do involve risks.

Consequently, public sector investments require an appropriate risk premium for the same reasons as do private sector investments.

The Authority is mindful of a preference amongst regulatory bodies in Australia for utilising CAPM to estimate the cost of equity, primarily because CAPM is considered more objective than alternative models, is conceptually simple in terms of defining and measuring the equity beta, and may be applied across all business activities. CAPM is considered appropriate for establishing the rate of return for an efficient private sector service. It is also considered a relevant benchmark for public sector bodies subject to the competitive neutrality requirements of COAG. It thus provides a sound basis for consistent public policy.

At the same time, the Authority notes that there are practical difficulties in implementing CAPM, especially in respect of publicly owned monopoly assets for which there are often no directly comparable business activities listed on a stock exchange.

The Authority also notes that CAPM is a single period model, which assumes that all investors have a common time horizon of unspecified length. It therefore has difficulty capturing the multi-period nature of most investments. As a result, the application of CAPM involves a certain degree of imprecision. However, the Authority believes that CAPM remains the simplest and best understood approach to determining the cost of equity for regulatory purposes, and accordingly supports its use.

5.3 Issues in the Selection of a WACC Equation

WACC can be calculated on either a pre-tax or a post-tax basis and on either a nominal or a real basis. Alternative specifications are discussed in Appendix C. The appropriate WACC to use depends on what is included in the business activity's cash flow. For example, nominal cash flows should be discounted with nominal discount rates while post-tax cash flows should be discounted with post-tax discount rates. Each of the approaches should be equal in perpetuity but there can be significant differences when measured in discrete time.

The major elements driving WACC are the determination of the cost of equity, the cost of debt, and the appropriate capital structure. The selection of an appropriate tax rate and the treatment of dividend imputation are also important, either through direct inclusion in the WACC formula or in the cash flows.

Pre-tax or post-tax WACC

The formulation of WACC and the definition of the cash flows used to calculate the revenue requirement should be consistent. A business activity's cost of equity funds (as imputed using CAPM) is usually expressed on a post-tax (but before personal tax) basis.

The use of a pre-tax rate of return is advocated on the grounds that it avoids the need to explicitly estimate the tax obligations of the regulated business, and is therefore less intrusive, leaving the regulated business activity to manage its own tax affairs. However, a tax calculation still needs to be undertaken to convert the post-tax rate of return indicated by CAPM benchmarks to the corresponding pre-tax rate required for the regulatory framework. Hence, as both approaches require tax liabilities to be properly assessed, there is little difference between a post-tax and pre-tax formulation of WACC in this respect.

Arguments in favour of a post-tax WACC include:

- post-tax measures of return are more relevant to investors;
- corporate taxes are a cost to the company like any other cost;
- adopting a post-tax WACC requires cash flow modelling to explicitly address the cash flow implications of taxation liabilities and a business activity's financial position. Accordingly, this approach is more transparent and rigorous; and
- there is difficulty in estimating a long term effective tax rate, as the tax system is not static.

Nominal or Real WACC

Nominal and real rates of return are equivalent provided consistency is maintained with inflation adjustments, depreciation allowances and debt. In other regulatory decisions, the Authority has adopted a nominal WACC. Arguments in favour of a nominal framework include:

- depreciation in a nominal framework is transparent and there is no potential for confusion over the extent of recovery. This is not the case for a real framework, as depreciation allowances include adjustments for inflation so that accumulated depreciation may exceed the actual cost of the asset unless depreciation amounts are deflated;
- similarly, interest expenses and other non-inflationary cash flows such as capped revenues or revenues from contracts containing no CPI adjustments require particular caution when converting from nominal to real. Errors in the conversion will result in discrepancies in the underlying cash flows;
- tax and balance sheet items such as debt and equity are all expressed in nominal terms. Consequently, the stock of debt must be deflated if modelling is to be undertaken in real terms;
- a nominal WACC is directly comparable with other financial benchmarks such as the nominal rate of return of other investments; and
- the nominal approach is the preferred approach of academics and financial market participants.²⁹

At the same time, the Authority notes that the use of a real WACC has sometimes been promoted on the basis that:

- there is no need to deflate the asset base, as is required in applying a nominal WACC;
- it simplifies the estimation of rebates for contributed assets (using a nominal approach, inflation gain on assets must be identified and separated); and
- it simplifies cash flow models, particularly when different rates of inflation may be defined for capital and operating expenditure (opex) costs.

Other Jurisdictions

The ACCC (1999) noted:

‘Given there is little to choose between post-tax and pre-tax formulations, the issue is fundamentally how best to assess tax liabilities – short or long term. There are a number of flaws associated with the use of a long term pre-tax WACC including:

- front end loaded investor returns (where actual tax payments tend to be concentrated towards the end of the life of the assets. This arises because tax depreciation provisions (especially in the presence of accelerated depreciation) historically have allowed capital expenditures to be written off faster than the economic rate of depreciation. As a result businesses obtain returns well in excess of those intended under the regulatory framework in the early years but these are offset by lower than commercial returns later on);

²⁹ For example see Davis (2000).

- uncertainty over long term tax provisions; and
- difficulties in estimating long term effective tax rates and applying them within a formula based approach.’

The ACCC (2000a) discussed a number of problems associated with converting a nominal post-tax WACC to a real pre-tax WACC, including:

- conversion formulae have been shown to be significantly in error in ensuring the correct return on equity, although this problem can be overcome by modelling the expected cash flows and taxes over the life cycle of the asset portfolio; and
- the conversion process is unsuitable for assessing revenues over multiple periods where the business regime (principally taxes and inflation) is more likely to change, as it is extremely difficult to adjust the returns already allowed to take account of the new business regime, resulting in over- or under-recovery of costs.

The ACCC (2000a) noted that using a post-tax nominal framework avoids these problems as the return on equity and estimated taxes payable allowances are separated in the Annual Average Revenue Requirement formula. The tax payable can therefore be adjusted from period to period. The ACCC cited support for such an approach from Professors Officer, Hathaway and Davis.

The ACCC also discussed a drawback of the post-tax nominal framework, namely that customers of a network at different points in time will pay different charges for the same set of assets as a result of the assets’ changing tax position rather than the underlying value of the service being provided. This is particularly the case where the firm takes advantage of tax concessions in the early years of the life of an asset, with tax liabilities increasing over time (the so-called S-bend debate). In effect, this approach passes on to users the tax benefit attached to the investment by the legislators. Moreover, where a firm has a portfolio of assets, this effect is somewhat muted. In addition, the forthcoming removal of accelerated depreciation will mean the S-bend phenomenon is progressively reduced.

Stakeholder Comment

SunWater supports the use of a post-tax nominal WACC.

QCA Analysis

The Authority supports the views of the ACCC and a range of independent experts (such as Professors Davis, Hathaway and Officer), which indicate that there is a general trend toward the use of a post-tax nominal framework. In particular, the post-tax specification is preferred for its transparency and because tax liabilities are explicitly treated as cash flows in the years that they occur. For these reasons, all of the Authority’s pricing decisions to date have been based on a post-tax nominal basis.

5.4 Quantifying the Risk Free Rate

The derivation of a return on equity under CAPM requires the estimation of a risk free rate. The risk free rate represents the rate of return on an asset with zero default risk.

There are two issues that need to be considered in the choice of an appropriate proxy for the risk free rate:

- the maturity period of bonds that should be used to identify the interest rate; and

- the method of measurement of the risk free rate (in particular, whether an ‘on the day’ rate should be applied or whether the rate should be averaged over some period of time).

Other Jurisdictions

Table 5.1 summarises the approaches adopted by different jurisdictions in determining the risk free rate.

Most regulators have elected to apply the ten year Commonwealth bond based on some form of averaging. While the choice of averaging period is somewhat arbitrary, the rationale for adopting the 20-day average is to minimise the effect of daily distortions while capturing the most recent information and expectations on inflation.

Table 5.1: Risk free rates used in regulatory decisions

<i>Entity/Author</i>	<i>Industry</i>	<i>Benchmark bond</i>	<i>Estimation factor</i>
ACCC (2000b)	Gas transmission	10 year Commonwealth	40 day moving average
OffGAR (2000b)	Gas transmission	10 year Commonwealth	20 day average
IPART (2000b)	Gas distribution	10 year Commonwealth	20 day average
IPART (2000a)	Water Supply	10 year Commonwealth	20 day average
IPARC (1999)	Water and electricity	10 year Commonwealth	20 day average
GPOC (2001)	Bulk water	10 year Commonwealth	45 day average
ACCC (2000a)	Electricity transmission	10 year Commonwealth	40 day moving average
QCA (2001a)	Electricity distribution	10 year Commonwealth	20 day average
IPART (1999d)	Electricity distribution	10 year Commonwealth	20 day average
ORG (2000)	Electricity distribution	10 year inflation indexed	20 day average
OTTER (1999)	Electricity distribution	10 year Commonwealth	12 month rolling average

Stakeholder Comment

SunWater supported the risk free rate being determined on the basis of the 10 year Commonwealth bond rate with that rate being determined on the basis of the 20 day average yield.

QCA Analysis

Choice of Maturity

In terms of the maturity period, the debate centres on whether the maturity of the risk free rate should be set equal to, or as close as possible to, the life of the investment, or to the regulatory review period.

According to Officer (1981), ‘the appropriate rate is that on a risk free security, eg. a government bond or note, of the same duration as the term of the investment’. This approach is supported by the ORG (1998a, p.14):

‘In other relevant jurisdictions, there is recognition that amortisation of relevant assets must be over their full economic life which implies that investors must have an expectation that they will be compensated for making long term investments before they commit to the investment. Therefore, even though regulators may review investment returns at regular intervals, it would be a mistake to believe investors’ planning horizons only extend to the next review. Models of expected returns and any regulation of those returns must reflect and take account of the investors’ planning horizons. The reapplication of the prevailing long term rate every five years is sufficient to achieve this, as the owners of the project make their investment decision based on the life of the project, using the appropriate discount rate determined with reference to the prevailing yield curve.’

The ORG also noted that some gas industry stakeholders had expressed concern that the use of short term rates to coincide with the regulatory period would cause companies to concentrate their re-funding around each price review determination. It was argued that the use of such a rate would also cause periodic spikes in corporate bond rates due to the concentration of refinancing around the time of each re-set of the regulatory WACC.

It is also important to ensure that there is consistency between the choice of the risk free rate and the assumed market risk premium (MRP). According to ORG (1998a), given that the available risk premium is expressed relative to the ten year bond rate, this rate is preferred as there is no additional benefit for calculation of the equity rate of return in using the five year bond rate.

In this context, ORG argued that selection of the five year bond rate as the risk free rate would require the application of a MRP which measures the expected return on equities as a margin over the five year bond yields:

‘It has been suggested for example, that the choice of a shorter (or longer) rate will just lead to a higher (or lower) measured market risk premium, with no effect on the expected return for the well-diversified portfolio (and hence little effect on the required equity return). As the estimation of the market risk premium generally has used the current yield to maturity on Commonwealth Government securities of about ten years until maturity, this argument suggests that the risk-free rate should reflect a security of a similar term.’

As opposed to Officer, Davis (1998) suggests that, if the allowable WACC is to be revised periodically, then it is not necessary to use a long term rate for the risk free rate. Rather, Davis seeks to relate the prevailing interest rate to the length of the review period:

‘Given the anticipated life of the assets and the likely time pattern of the resulting cash flows, it would seem very difficult to sustain an argument for use of a risk-free rate greater than 10 years. Use of a shorter maturity rate would not be inappropriate – particularly if there were to be regular regulatory pricing reviews.’

Other arguments used to support the use of a rate linked to the regulatory period include that:

- it is rare for initial debt funding for capital investments to extend beyond ten to fifteen years and, in any event, it is likely that interest swaps would be re-set on a five yearly basis. However, interest rate swaps are available for a range of maturities from one to ten years; and
- even where a long term cost of capital is appropriate to the valuation of long-lived assets, it does not follow that it is appropriate for pricing decisions in the short run when the asset values are adjusted annually for inflation (thus removing the need for an inflation risk premium) and the allowable cost of capital can be revised at each review (to adjust for long term changes in market perceptions).

However, as indicated earlier, adoption of a five year bond rate as a matter of principle would effectively require a counterbalancing adjustment to the MRP on the basis that it has traditionally been calculated against the ten year bond rate. Given the broad consistency of the margin between the five year and ten year bond rates over time, the most practical approach is to adopt the ten year bond rate and use the standard calculation of the MRP.

With respect to the issue of a premium to address the difference between the ten year bond rate and a 30 year bond rate, the Authority recommends that no adjustment should be made on the grounds that:

- the 30 year market is too thinly traded to return an appropriate measure of the premium; and
- consistent with the argument concerning the relationship between the risk free rate and the MRP, adoption of a 30 year rate would require a compensating adjustment to the calculated MRP, thereby substantively negating the impact of adopting a 30 year rate.

The Commonwealth ten year bond has been used as the benchmark for estimating the MRP as it is a liquid investment, provides the best reflection of the market risk free rate and can be identified using available market data. However, given that the arguments are finely balanced, and that the ten year bond is preferred for practical reasons, it is considered that there is scope for further research and analysis on this issue.

Method of Measurement

In terms of the measurement of the risk free rate, it is possible to use either an ‘on the day’ rate or an average. The ‘on the day’ rate is considered to be the theoretically correct rate to use, as it reflects all available information, including any historical information about previous rates. However, this rate may be subject to short term volatility, for example, due to central bank intervention or abnormal trading activity. To overcome this problem, some form of averaging may be used. For example:

- a short term average of the ‘on the day’ rate could be applied if the rate suffers a perturbation on the day of the decision; or
- an average rate reflecting trading over (say) the past 20 to 40 trading days could be used.

On the issue of averaging versus an ‘on the day’ rate, the Authority notes that other regulators considered the ‘on the day’ approach to have greater theoretical validity, but preferred an average on the grounds that it removes the potential for a short term fluctuation to influence the rate used.

The Authority has concluded that an averaging process should be used and has opted to average the selected interest rate over 20 trading days.

For the purpose of determining the WACC, the Authority recommends that a 20 trading day average of the ten year bond rate should be used, an approach consistent with the Authority’s recent regulatory decisions. For the 20 trading day period ending 6 October 2000, the Commonwealth government bond rate averaged 6.17%.

5.5 Quantifying the Market Risk Premium

The CAPM formula also requires the estimation of the MRP, measured as the difference between the expected return on equity investments as a whole and the risk free rate. The MRP

represents the reward that investors require to accept the uncertain outcomes associated with equity investment, relative to the return provided by the risk free rate.

Other Jurisdictions

In recent regulatory decisions for electricity, gas and water throughout Australia, the MRP has generally been set at 6%, with IPART preferring a range of 5% to 6%. Office of the Water Regulator's (Ofwat) final decisions for UK water suppliers used a range of 3% to 4%.

Stakeholder Comment

SunWater proposed a MRP of 6.5%, which is in line with long-term historical averages, but higher than the 6% typically used by the Authority and other regulators in Australia. SunWater indicated that their argument for an increase in the MRP (relative to the Authority's previous decisions) is not based on any new evidence or recent data. Rather, they argued that it is due to a more accurate assessment of the existing data.

SunWater argued that the long-term historical MRP is between 6% and 8% and that a value at the lower end should not be chosen as this may produce a WACC that discourages new investment. Their principal reasons relate to claims that previous regulatory decisions:

- have not adequately reflected the range of estimates; and
- have not used an appropriate point within that range.

SunWater contended that a range of 6% to 8% is appropriate for a long term MRP based on the various studies that have been undertaken. They stated that the midpoint of this range, 7% is well above the 6% figure that has generally been used by regulators in Australia.

SunWater raised a number of reasons why a point estimate at the lower end of the range is inappropriate, including:

- the data on the MRP does not provide statistically significant results to support the hypothesis that the MRP has reduced over recent years;
- while there has been a period when the ex post MRP has departed significantly from the long-run average, it is likely there will be a period when the ex ante MRP is changing but in the opposite direction;
- reasons used by regulators in the past to justify any structural change in the market and the adoption of a point at the low end of the range are not justified based on available data; and
- due to the short period that the Australian market has been deregulated and integrated into the international market, there is insufficient data to determine an appropriate MRP based on data from an unregulated market, presumably one undistorted by government intervention. SunWater suggested that a benchmarking approach with a similar market may be more appropriate. SunWater suggested that this benchmarking approach would indicate that a figure at least at the upper end of the 6% to 8% range would be appropriate for Australia.

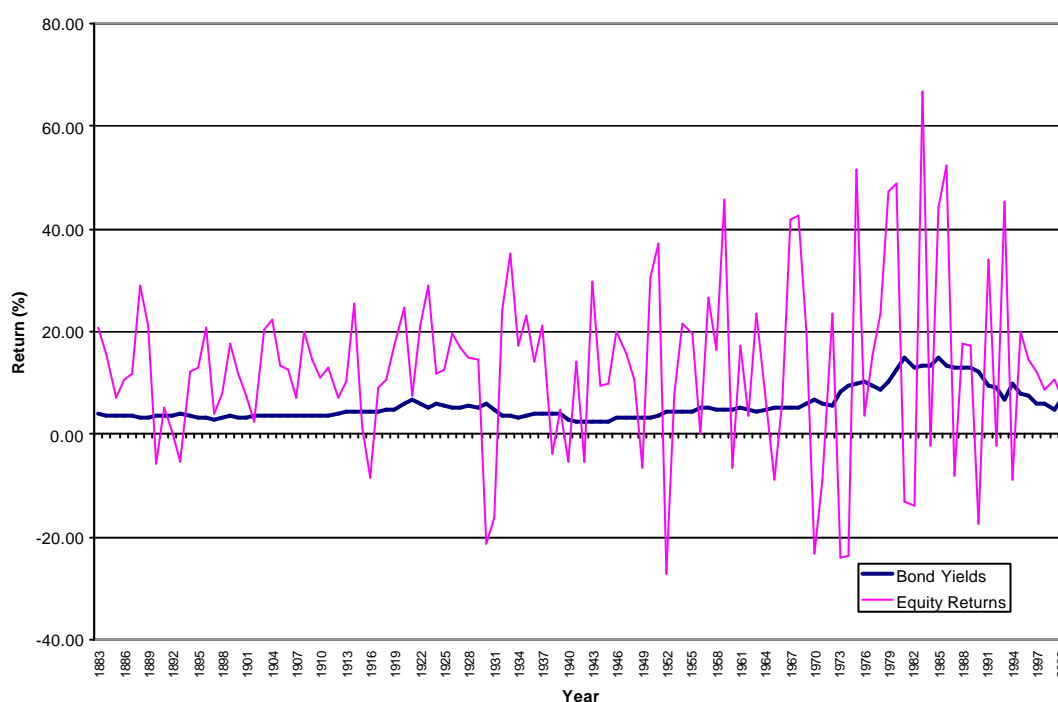
In response to the Draft Report, Mareeba Dimbulah Customer Council (MDCC) indicated that the MRP was already reflected in the Queensland Treasury *Guidelines for Financial and Economic Valuation of New Water Infrastructure for Queensland* (September 2000) and *Project*

Evaluation Guidelines (March 1997) and did not need to be addressed by the Authority. They also noted that they failed to see the relevance of utilising information from the UK in assessing market risk premium as the UK water industry operates within a significantly different market environment.

QCA Analysis

The MRP is based on the difference between the return on the market as a whole and the risk free rate, both of which vary over time. As shown in Figure 5.1, equity market returns are significantly more volatile than debt market returns. Both the equity and debt markets are influenced by short term business cycles and the fact that measures of the risk premium are influenced by the measurement period.

Figure 5.1: Bond and equity returns: 1882 to 1998



CAPM requires that a forward-looking MRP be based on a time frame corresponding to the period of the analysis. However, in practice, this data does not exist. Alternative methods are suggested in the literature to estimate the MRP, including surveys, consumption based modelling and the use of historical data.

Most regulators have preferred the use of a MRP proxied from historical data. Officer (1985) measured the MRP as the difference between the arithmetic nominal return on shares and the average annual yield on long dated government securities.

Problems with the use of historical data to estimate the MRP include:

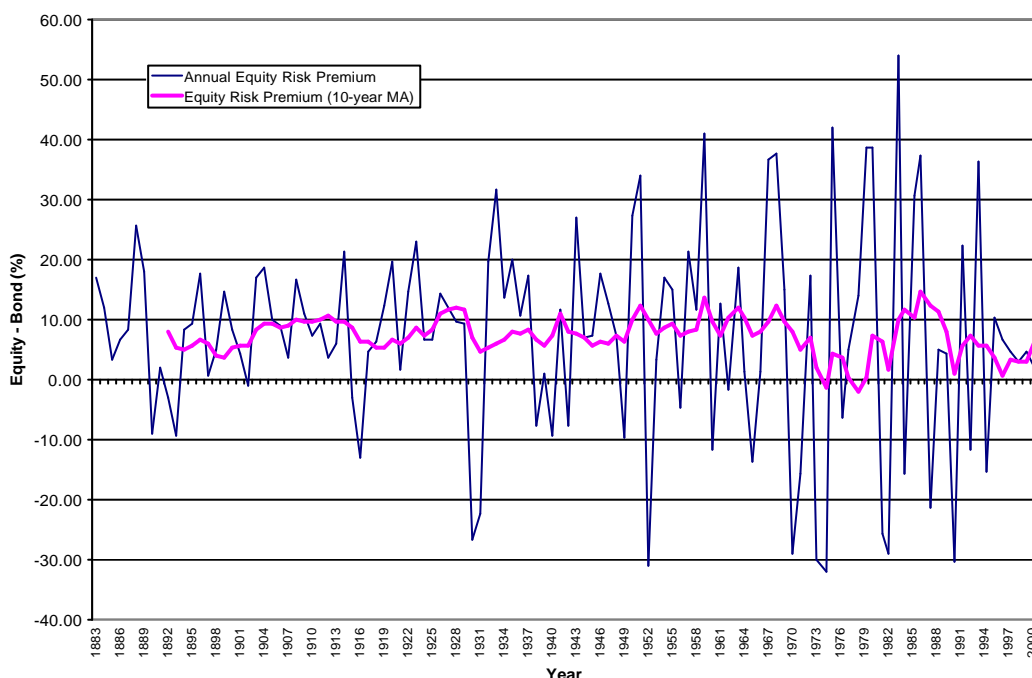
- the choice of proxies for the risk free rate and the return on the equity market. Typically, studies will use the All Ordinaries Accumulation index as their proxy for the equity market and the ten year Commonwealth bond rate as proxy for the risk free rate;
- structural breaks, which may cause the average ex post returns for the market and the risk free rate to differ materially from those initially expected. A structural break occurs when

time series data switches from one regime to another due to an exogenous shock. For example, the deregulation of Australian interest rates in 1979 or the floating of the Australian dollar in December 1983; and

- whether the averages should be arithmetic or geometric. Arithmetic means are consistent with the CAPM framework. However, the use of geometric means has been justified on the grounds that it takes into account continuous compounding. Geometric averages will be lower than arithmetic averages.

The Authority calculated market risk premia for the period 1887 to 1998 using Officer's method. Figure 5.2 shows the annual and ten year moving average MRP. The ten year average equity risk premium has been relatively stable over the past century. This has occurred despite increased volatility in the annual MRP series and the change from regulated to deregulated financial markets over the past 25 years.

Figure 5.2: Market risk premium



Prior to the introduction of dividend imputation in July 1987, equity returns observed in the stock market represented rates of return after all corporate taxes had been paid (but before shareholder taxes were paid) and therefore could be used in determining the post-tax cost of equity funds for an entity. IPART (1998, p.16) suggested that, following the introduction of dividend imputation, the risk premium could have fallen to reflect the additional value of franking credits received on an investment.

The findings of Australian academic studies and regulatory decisions suggest that the MRP has ranged from 6% to 8%. There is also a general view that this historical range may be too high, though as yet the evidence is inconclusive. In correspondence with the Authority, Professor Officer indicated that he supports a range of 5% to 7% for the current MRP.

This change from earlier periods cannot be solely attributed to dividend imputation. This has also been a period of low interest rates, low inflation and stability in the Australian economy, combined with high levels of private share ownership, increased institutional ownership of shares arising from changes in superannuation, and reduced information risks due to improved communication and technology.

The Authority has made a series of regulatory determinations in which a MRP of 6% has been adopted. Justification for moving away from 6% cannot be proven in a statistical sense.

On balance, the Authority believes that, even after revisiting all historical data, there is insufficient evidence to change the level of the MRP from previous regulatory decisions of 6%.

Following consideration of submissions and recent regulatory trends, the Authority concluded that the most appropriate estimate for the MRP is 6%.

With regard to the issues raised by MDCC, neither of the guidelines referred to directly address the market risk premium. Rather, they provide general guidance on the appropriate approach to determining the WACC (that is, to apply CAPM) and provide guidance on the discount rate to be applied for the general budget sector where a specific rate cannot be estimated.

The Authority's approach to the WACC is entirely consistent with the Treasury Guidelines. The Authority has used the CAPM model as a basis for identifying the relevant cost of capital for the provision of water to BRIA irrigators.

With regard to the second issue raised by MDCC, the Authority did not utilise information from the UK in determining the market risk premium. However, given the limited number of private water businesses in Australia, many of which are relatively new, the Authority estimated the appropriate asset beta after considering a range of factors, including overseas companies as well as other regulators' decisions and the factors that impact on the variability of SunWater's returns relative to the market. The Authority acknowledges the difficulty of using international comparisons due to different market environments and stock market compositions.

5.6 Determining the Capital Structure

Capital structure refers to the proportion of debt in the total capital employed by a business. Capital structure affects the level of financial risk and return to equity holders. The higher the level of debt, the higher the equity beta will be and the higher the corresponding cost of equity. In general, there is potential for companies with predictable cash flow businesses, particularly in a regulated natural monopoly environment, to operate with higher gearing ratios than those with a mix of other business activities.

Other Jurisdictions

The level of gearing assumed in other regulatory decisions is typically in a range from 50% to 60%. Both IPART's (2000a) review of NSW water businesses and ORG's (2000) review of electricity distribution entities used a debt to assets ratio of 60%. IPARC (1999) used a range of 40% to 60% in its price direction for ACTEW.

In Tasmania, GPOC (2001) used a debt to assets ratio of 50%. In all recent electricity and gas decisions, a gearing level of 60% has been adopted.

Ofwat in the United Kingdom has proposed a benchmark gearing (debt to debt plus equity) ratio of between 45% and 55% for both regulated water and water and sewerage companies. This represents its view of a prudent and desirable capital structure for such companies. Where companies are outside this range, Ofwat imputes a shadow capital structure for the purposes of determining a regulated price.

Stakeholder Comment

SunWater proposed a gearing level of zero, which is essentially the actual capital structure of the Scheme. Their rationale for this is that current prices would preclude SunWater from being able to service any debt.

QCA Analysis

The capital structure adopted for regulatory purposes may be that actually existing for the regulated business activity, or some industry benchmark.

Adopting actual capital structures raises the question of how changes over time in the actual capital structure are to be incorporated into the WACC, and at what point in time a capital structure is to be determined for input into the WACC.

Australian urban water utilities generally demonstrate low levels of gearing, as shown in Table 5.2 for selected entities. In contrast, the South East Queensland Water Corporation (formerly South East Queensland Water Board) has been established with a gearing of approximately 50% as part of the corporatisation process, up from a gearing of around 12% previously.

Low levels of gearing can be appropriate when there is concern about cash flow volatility resulting in an inability to meet interest payments to external parties. However, no evidence has been provided that this is the case for BRIA assets.

Table 5.2: Debt/equity ratios – Australian water businesses, 2000-01

<i>Water Business</i>	<i>Debt / (Debt + Equity)</i>
Brisbane City Council	0.12
Gold Coast Water	0.12
ACTEW	0.84 ¹
Melbourne Water Corporation	0.26
Hunter Water Corporation	0.05
SA Water Corporation	0.21
Sydney Water Corporation	0.17

Source: Water Services Association of Australia (WSAA), 2001.

1. ACTEW's level of debt includes borrowings to fund capital repatriation to the ACT Government.

There is a general trend amongst corporatised infrastructure entities to move to more commercial capital structures and typically closer to 50% debt to total assets. And, having regard to the low volatility of the revenues associated with the BRIA, the Authority has adopted a gearing rate of 50%.

If evidence of substantial cash flow volatility were to be provided, the Authority would be prepared to reconsider this matter. At the same time, the Authority notes that gearing variations do not have a substantial impact on an entity's WACC, rather they impact the return on equity.

5.7 Determining the Cost of Debt

The cost of debt is the return that a business activity's debt holders demand on new borrowings. It varies depending on a variety of risk factors including liquidity, timeliness and default, the latter two of which are in turn affected by the gearing of the company (high gearing means a high level of debt relative to cash flows and consequently a higher risk of default), the short term volatility of cash flows and the long term security of revenue.

The cost of debt may be determined either as a weighted average of the existing debt of the business activity or the marginal rate at which a business activity can raise debt financing. The latter is usually expressed as a margin over the risk free rate.

Other Jurisdictions

The debt margins used by other regulators have ranged from 80 to 160 basis points. IPART (2000a) used a range of 80 to 100 basis points for its price direction for the Sydney, Hunter, Gosford and Wyong water suppliers. IPARC assumed a range of 100 to 120 basis points for ACTEW. GPOC (2001) used a debt margin of only 70 basis points for its bulk water prices draft report. The Authority (QCA 2001a) adopted a margin of 165 basis points for its final determination for electricity distributors, consistent with a BBB+ debt rating.

Stakeholder Comment

SunWater did not propose any debt margin as their preferred capital structure involved no debt.

BRIAC proposed that, if any debt did actually exist, the rate incorporated should be the cost of the actual debt. This is the Government bond rate, or the risk free rate.

QCA Analysis

The use of the actual cost of debt (either an average of actual costs, or the marginal cost of debt) has the benefit of reflecting those costs currently faced by the entities concerned. However, such an approach has the potential to entrench higher debt costs and does not create incentives to seek the most efficient form of financing, as it accepts the prevailing rate of debt even if it is not the most cost effective available.

The use of a margin above the risk free rate provides an incentive to ensure that debt costs are efficient and competitively neutral. This view is consistent with the approach adopted by the ACCC, IPART and ORG.

The margin above the risk free rate should reflect the credit rating of the business activity. Credit ratings are normally performed in a two stage process. The first stage is qualitative and assesses the relative business risk profile of a business activity.

The second stage is the quantitative assessment of the business activity's financial risk profile as a consequence of the methods used to finance its business activities and its capital structure. These assessments are used in combination to arrive at a credit rating.

SunWater's SCI requires that SunWater has a target credit rating of BBB. This represents the perceived target level of risk for SunWater's debt and has been adopted for the purposes of the establishment of a WACC for the provision of water services in the BRIA. In the Draft Report, the Authority noted that there may be a case for the adoption of a higher credit rating when the cashflows of the BRIA are considered. However, it would be inappropriate to consider this matter in isolation from the other methodological issues raised by NECG (see 5.13 below). These matters will require research and consideration by the Authority given the applicability of many of them to all sectors covered by the Authority. This is not possible within the reporting deadline for this current assessment.

The spread between BBB rated corporate bonds and Government bonds is known to increase with the maturity of the bonds. For internal consistency, the Authority has based its analysis on the spread between bonds of ten years maturity.

Based on the differential between the risk free rate and BBB rated debt with a ten year term as at the time the price paths were set, that is October 2000, a debt margin of 180 basis points is recommended.

5.8 Determining Equity and Asset Betas

Estimating asset and equity betas requires information on the economic performance of a particular business activity, including its dividends, capital repatriation and changes in market value, over a continuous period. This information is not readily available for business activities such as rural water businesses that are not listed on a stock exchange or a similar equity market.

Because of the relative scarcity of publicly-listed regulated utilities, this problem has confronted Australian utility regulators (including the Authority) in the past. The typical response has been to estimate a proxy beta, based on a range of reference points, including:

- comparable Australian companies listed on the Australian Stock Exchange (ASX), as well as listed companies that have a similar risk profile;
- comparable overseas listed companies;
- decisions and judgments of other regulators, both in Australia and overseas; and
- factors that impact on the variability of, in this context, SunWater's returns, relative to the water sector in general and to the economy overall.

Appendix D discusses the equity, debt and asset betas in more detail and identifies issues in their calculation.

Other Jurisdictions

Few jurisdictions have explicitly considered appropriate regulatory asset/equity beta benchmarks for rural water business activities. The focus of regulatory price setting in this sector has by and large been on setting price paths which satisfy the lower bound revenue threshold. This revenue benchmark, by definition, does not incorporate a return on capital and, consequently, the application of CAPM and the estimation of its components has not been considered necessary.

In New South Wales, IPART's October 2001 determination of bulk water prices for the NSW Department of Land and Water Conservation (DLWC) indirectly considered the appropriate rate of return, in relation to the return that would apply to all new rural water investments. IPART initially proposed a rate of return of 5% (real, pre-tax), though the Tribunal was persuaded by the DLWC that this return should be increased to 7%. However, IPART did not provide any explanation of the parameters underpinning this figure, so no direct asset/equity beta comparison can be inferred.

However, for urban water businesses there have been several recent regulatory decisions explicitly addressing the estimation of asset and equity betas. Table 5.3 outlines asset and equity betas used in these recent regulatory decisions, including the Authority's recently released decision for the GAWB.

IPART's (2000a) price determinations for the Hunter, Sydney, Wyong and Gosford water providers were based on asset betas over a range from 0.3 to 0.45. IPART's method produced a range of real pre-tax WACCs from which a point estimate was selected. As a result, no point estimates for asset and equity betas were reported. IPART used a similar approach in its NSW electricity distribution determination (1999e), this time using an asset beta range of 0.35 to 0.5.

IPARC's (1999) determination for ACTEW used asset betas ranging from 0.3 to 0.5, while GPOC, in its draft report for bulk water pricing, used an asset beta range of 0.3 to 0.55.

Ofwat (1999) quoted a range for equity betas of 0.7 to 0.8 for its water and sewerage charge determinations for UK water companies. Asset betas were not specifically identified.

In other sectors, ORG's electricity distribution price determination (2000) and the Authority's below rail coal network analysis (QCA 2000b) were based on an asset beta of between 0.45 and 0.5.

Table 5.3: Asset and equity beta factors used in regulatory decisions

<i>Entity/Author</i>	<i>Industry</i>	<i>Asset beta</i>	<i>Equity beta</i>
ACCC (2000b)	Gas transmission	0.6	1.5
OffGAR (2000b)	Gas transmission	0.65	1.33
IPART (2000b)	Gas distribution	0.4-0.5	0.9-1.1
IPART (2000a)	Water Utilities	0.3-0.45	0.65-1.02
IPARC (1999)	Water and electricity	0.3-0.5	0.74-0.79
GPOC (2001)	Bulk water	0.3-0.55	0.495-0.958
OffGAR (2000a)	Gas distribution	0.55	1.08
SAIPAR (2000)	Gas distribution	0.45-0.6	0.94-1.06
ACCC (2000a)	Electricity transmission	0.35-0.5	1.0 (range of 0.78-1.25)
QCA (2001a)	Electricity distribution	0.45	0.71
QCA (2000b)	Below-rail coal network	0.45	0.76
QCA (2001b)	Bulk water	0.45	0.60
ORG (2000)	Electricity distribution	0.5	0.95

Stakeholder Comment

Of the submissions received, only one (from SunWater) presented a view on the estimation of asset and equity betas. The BRIAC submission disputed the validity of using the WACC/CAPM approach itself, but did not provide specific comments on the method by which asset or equity betas should be determined by the Authority.

SunWater's submission recommended an asset beta of 0.60. The submission noted that, in the absence of any comparable listed Australian companies, relevant benchmarks can be drawn from overseas listed companies, as water businesses are not always publicly owned internationally.

SunWater identified a large number of listed overseas companies with operations in water (filtration and separation) and water treatment. This analysis implied a mean adjusted asset beta of 0.62, which SunWater proffered as support for an asset beta range of 0.60-0.70 and for its recommended asset beta of 0.60.

SunWater's submission also provided a discussion of recent regulatory decisions on appropriate asset betas for the water sector, though it contended that its recommended asset beta of 0.60 was preferable to the observed range from recent regulatory decisions of 0.30-0.50.

SunWater also commented that observed low variability in its cashflows was more the result of a low Ministerially-determined price path than a measure of the underlying volatility of the business' cashflows relative to the economy overall.

QCA Analysis

The lack of readily observable market data for rural water businesses presents a particular problem for the Authority in estimating an appropriate asset/equity beta for the BRIA. It means that the Authority must rely on second-best alternatives, such as benchmarks drawn from international companies or from other "similar" regulatory determinations.

There are a number of problems in drawing comparisons from overseas companies and markets. Equity betas measure the relationship between a business activity and the equity market overall. As a measure of relative risk, observed equity betas in one country are not directly transferable to another.

Two prominent sources of potential error here are that different country stock market indexes have different compositions, and are measured in different (local) currencies. For instance, relative to the Australian market the US market is weighted more heavily towards technology stocks and less heavily towards resource stocks. The same economic shocks will therefore affect these markets differently, and a beta estimated in one market will differ from that estimated in the other.

Using foreign comparator businesses is inappropriate unless compensating adjustments are made to account for fundamental structural differences between markets. These issues do not appear to have been taken into account by SunWater in its submission.

Looking at the analysis presented to the Authority by SunWater, comparator companies have been drawn from a number of different countries, including France, Brazil, China, Chile, Greece, Spain, Hong Kong, Italy, Israel, the United Kingdom and the United States. Arguably, the more substantive differences between the Australian market and equity markets in developing countries makes these benchmarks less valid. Looking only at the US and UK companies, the (unadjusted) average asset beta falls in a range from 0.45 to 0.62. Adding the companies from France, Spain and Italy – which gives a total of 17 companies – the average asset beta is marginally lower, at 0.44.

The Authority also notes recent data published by the London Business School's Risk Measurement Service that suggests that utility company betas in the UK are continuing to fall. For instance, the Kelda and Severn Trent water companies have seen their respective equity betas drop from 0.76 and 0.60 in July 1999, to 0.43 and 0.22, in April this year.³⁰ This trend is evident across the UK utilities sector, and seems counter-intuitive given a move towards more highly geared capital structures on the part of many utilities. One theory is that the variance of utility company earnings has not changed markedly, but overall equity market volatility has increased over this period, hence beta as a measure of relative risk has declined.

In regard to drawing comparisons from "similar" regulatory decisions, the Authority has looked for guidance at a range of domestic regulatory decisions as shown in table 5.3.

³⁰ London Business School (2002), *Risk measurement service: April – June 2002*, 24:2

By its very nature, the calculation of the WACC using CAPM to estimate the return on equity involves some degree of imprecision. At the same time, the Authority considers that, in applying CAPM in a regulatory setting, regard must be had to the risks of allowing too low a rate of return. Consequently, the Authority has considered adjusted (as well as raw) betas in the assessment of the rate of return.

Based on all the above, it has been concluded that asset betas for the water industry typically fall within a range from 0.3 to 0.45, with most falling around 0.3 to 0.4, although GPOC considers they may range up to 0.55 in Tasmania given that State's smaller water businesses and the tendency for these to have less diversified customer bases.

However, such comparisons are not without difficulties. Most importantly, for the purpose of comparison, utilities and regulatory determinations should be in the same market sphere. Yet all of the available regulatory precedents in the water sector are for *urban* water supply agencies, or for bulk water supply businesses that provide water exclusively to urban/industrial customers.

The obvious question is whether the same asset (equity) beta should be used for the BRIA as for a metropolitan water business such as Sydney Water or GAWB.

The Authority's review of available literature suggests that little research has been undertaken in this area. In part, this is because in the past there has been no need to consider the application of CAPM to the rural water sector and how the necessary input components might be estimated.

While it is probable that there are differences between rural and urban water supply that might give rise to variations in nondiversifiable risks (which should properly be reflected in estimates of asset betas), it is difficult to quantify the impact of these factors - in some instances even the direction of the impact is unclear.

However, returns in the rural sector are more likely to be determined by factors unrelated to the general performance of the economy. For example, returns in the rural sector will be affected more by climatic factors and conditions in international commodity markets. In addition, it is noted that there is a very low correlation between sugar prices and domestic equity market movements.

Further, in the case of the BRIA, the Authority noted that revenues can be expected to be stable (and therefore not reflective of movements in domestic equity markets) given the low variation in the water required to irrigate sugarcane.

Accordingly, the Authority is of the view that the asset beta for the BRIA should be consistent with the lower end of the range generally suggested for the urban water sector. As a result, it is recommended that an asset beta of 0.35 be used for the BRIA. With a 50/50 debt/equity capital structure and a debt beta of 0.30, the equity beta is equal to 0.40. The Authority notes that the adopted asset beta of 0.35 closely aligns with the lower end of the range suggested by IPART when methodological differences are taken into account.

5.9 Determining the Dividend Imputation Rate

Under the dividend imputation tax system, Australian resident taxpayers who receive dividends from Australian resident companies can claim a credit for tax that has already been paid by those companies in respect of that dividend income. Ignoring timing impacts, an Australian resident taxpayer can therefore be completely compensated for the incidence of company tax (but not personal tax).

It is possible to record the impact of dividend imputation either as an adjustment in the WACC calculation or as an adjustment to the cash flows of the business. This adjustment factor is known as gamma.

Gamma is typically expressed as a number between zero and one. A gamma of 0.5 implies that \$0.50 of each dollar of company tax paid will be redeemed by shareholders as an imputation credit. Higher (lower) estimates of gamma tend to reduce (increase) the estimated cost of capital, other things being equal.

Estimation of gamma

The valuation of imputation credits is determined by the following three key events in the life of imputation credits:

- creation;
- distribution; and
- redemption or utilisation.

The creation of imputation credits

Franked dividends are those dividends paid out of profits on which Australian corporate tax has been levied and which therefore carry a credit for income tax paid by the company. The after tax return to an Australian resident taxpayer on a share with a franked dividend will be greater than the return on an equivalent share with a non-franked dividend.

Dividends are able to be franked if the entity's income is earned in Australia and hence taxed at the corporate tax rate, and if the income has been earned since the introduction of the imputation tax system on 1 July 1987. It should also be noted that both dividends and franking credits can be issued from retained earnings and not just from the current year's free cash flows.

Distribution of imputation credits

An entity's dividend policy affects the value of imputation credits. The smaller the payout ratio, the less value imputation credits hold, as the time value of imputation credits diminishes if a company defers payment of fully franked dividends.

The introduction of dividend imputation in Australia has resulted in companies adopting generally higher payout ratios than during the pre-imputation period. Hathaway and Officer (1995) found that 80% of company tax payments are distributed as imputation credits.

The New Tax System reverses some of the incentive for high dividend payout ratios that emerged from dividend imputation because it gives capital gains a favourable tax treatment.

Redemption or utilisation of imputation credits

Shareholders attach different values to imputation credits depending on their tax status. Investors who do not pay Australian income tax, such as governments and foreign companies, gain no value from imputation credits, whereas Australian resident taxpayers can gain a full 100% benefit under the New Tax System.

Hathaway and Officer (1995) determined that 60% of the distributed franking credits are redeemed by taxable investors. However, under the New Tax System, Australian residents who

were previously only able to claim imputation credits to the extent of any tax liability are now entitled to a refund if their franking rebates exceed their tax payable. Subject to the other effects of the New Tax System, this of itself would tend to increase utilisation levels relative to historical benchmarks.

Other Jurisdictions

As noted above, CAPM estimates generally have not been undertaken for rural water authorities in Australia (or indeed internationally). Hence, there is no specific rural water sector guidance from other jurisdictions on the appropriate value of imputation credits for the BRIA.

Looking to other utility sectors, most jurisdictions have adopted a gamma of 0.50 for gas, electricity and water regulatory determinations. IPART has preferred to use a range, from 0.3 to 0.5, while the ACT's IPARC (now the Independent Competition and Regulatory Commission (ICRC)) (1999) used a range of 0.25 to 0.5. GPOC used a gamma of 0.5, as did the Authority's recent regulatory decisions for electricity, gas and rail.

The ACCC (1999, 2000a) argued that there was no well-founded basis for discriminating in favour of one type of investor over another – such a process may distort pricing outcomes based on share ownership, and does not take into account other tax advantages or disadvantages that may be available to investors. As a result, the ACCC supported the use of an industry average gamma. This view is also supported by the Office of the Tasmanian Energy Regulator (OTTER) (1999) and IPART (1999d, 1999g).

Stakeholder Comment

SunWater argues that imputation tax credits should be valued at zero as they are essentially worthless to a marginal (price setting) investor, where the marginal investor is not an Australian resident.

SunWater drew on previous research that indicated that most infrastructure investment in Australia had significant foreign equity involvement, which in its view suggested that a (hypothetical) marginal investor in SunWater is most likely to be a company with substantial foreign ownership and dividend imputation credits for this investor will be close to worthless. SunWater provided information on recent private sector investments in the water industry to demonstrate this point, all of which involved significant multinational involvement.

BRIAC submitted that SunWater should be treated as an income tax-exempt entity (as there is no tax payable by the State of Queensland) and, therefore, in BRIAC's view, the corporate tax rate in any WACC estimate should be zero, making any estimate of the effectiveness of dividend imputation irrelevant. MDCC submitted that payment of a dividend to Government has the capacity for Government to double dip in that, at some point in the future, a major pipeline may require replacing, but over a period SunWater may have been paying a dividend and then not be able to fund such a project without raising additional capital.

QCA Analysis

The treatment of dividend imputation is an area of significant regulatory controversy. There are both empirical differences as to the appropriate way gamma should be estimated, and theoretical objections to the way that imputation is accounted for in WACC determination.

In the context of the present investigation, the most prominent issue raised by stakeholders was whether gamma should be estimated based on the value of imputation credits to a "marginal"

investor, assuming non-government equity investment in the Burdekin Haughton Water Supply Scheme, of which the BRIA forms an integral part, were to be permitted.

SunWater submitted that the marginal investor is more relevant than estimates of market averages as it is the investor at the margin that determines share prices, and hence the cost of equity capital. In SunWater's view, the marginal investor in the Australian market for infrastructure equities is most likely to be a foreign domiciled company (or at least a domestic company with a substantial proportion of its shares held by overseas investors) that would "at best experience considerable difficulties in accessing imputation credits".

To support this view, SunWater cited a recent study by Cannavan, Finn and Gray (2002), which shows that, for companies with substantial foreign ownership, the market value of imputation credits was negligible. This would infer a value of zero for gamma.

Other studies, however, suggest that investors generally place a much higher value on franking credits. One such study by Walker and Partington (1999) considered equity market outcomes where there was contemporaneous trading of cum-dividend and ex-dividend shares, and found that gamma was significantly above zero – indeed, for the period assessed, gamma ranged between 0.88 and 0.96. The Authority is aware, however, of concern over placing too much stock in these results, as they are based on observed market outcomes in small and thinly-traded specialised markets on the ASX and the nature of the markets themselves tends to attract those investors who value imputation credits most highly.

Notwithstanding that some recent studies do support a lower (possibly even zero) value for gamma for companies with significant foreign ownership, it is by no means certain that non-government ownership of the Scheme – were it permitted – would be dominated by foreign interests. Nor does it necessarily follow that the marginal investor would be a foreign resident unable to benefit from Australia's system of dividend imputation. This conclusion is derived from the fact that:

- foreign investment in the water sector to date has mostly been in the areas of water and wastewater treatment and in some standalone pipeline assets, and mostly through vehicles such as so-called "public private partnerships" (PPPs). There is no market experience to guide any view on whether equity participation in a water business would be by foreign companies or domestic companies with a substantial foreign shareholding;
- in other utility sectors where privatisation initially saw substantial entry by foreign-based companies (such as Victoria's privatised electricity sector), there is now an apparent trend towards domestic companies taking a greater share of the market for equity in privatised utilities. It is arguable whether the "marginal" investor in these sectors is still foreign owned and unable to benefit from franking credits; and
- SunWater is not a large business in a global, or even an Australian, sense. At present, SunWater is capitalised at approximately \$210 million, with the Burdekin Haughton Water Supply Scheme representing only a fraction of this amount. It is unlikely that a domestic investor or the domestic equity market could not absorb capital of this scale, and therefore it is not obvious that there would be a need for foreign investment.

Also of concern to the Authority is the apparent bias that would be introduced into the WACC estimates were the Authority to determine a value for gamma based on whether the marginal investor was foreign or domestic. That is, the Authority is not convinced that the WACC should be higher for foreign-owned entities and lower for domestic-owned entities. Such a distinction draws away from the fundamental objective of assessing the relative riskiness of the assets, which should be unaffected by asset ownership and thus be competitively neutral.

The Authority also notes that the entire regulatory application of CAPM is structured around a domestic market, with all the parameters drawn from Australian market data. It is insufficient to simply adjust the value of gamma to account for the impact of foreign equity investors being unable to access franking credits. Rather, the regulator would need to apply an international CAPM framework, with matching international estimates for all the relevant parameters.

This is essentially the position adopted by the ACCC in its recent decision on access arrangements for GPU GasNet, and is based on advice commissioned by the ACCC from Lally (2002).

The Authority is of the view that it should persist with the approach of using a domestic CAPM. Of particular relevance here is the Authority's view that this approach is consistent with presently accepted commercial and regulatory practice, and therefore it possesses benefits in terms of being transparent, understood by market participants, and is reasonably consistent with the approach adopted by other jurisdictions.

Taking these factors and stakeholder comments into account, the Authority has concluded that:

- all BRIA profits will be earned in Australia and therefore are eligible to be franked;
- a domestic CAPM model is appropriate;
- the 80% market average of fully franked dividends identified by Hathaway and Officer (1995) is the best available estimate, as is their estimate of the range of utilisation of imputation credits at 60%.

On this basis, the level of gamma adopted is 0.5 (reflecting a distribution rate of 0.8 multiplied by the estimated utilisation rate of 0.6 and applied to 100% of BRIA profits).

While the changes to capital gains tax and the changes which allow the full flow through of imputation credits to resident taxpayers may have an impact on these levels, there is currently no clear indication of their impact. Further, the influences may be offsetting as the New Tax System may tend to reduce the level of dividend distribution, but may increase the utilisation rate.

As noted earlier, it is possible to record the impact of dividend imputation either as an adjustment in the WACC calculation or as an adjustment to the cash flows of the business. The Authority's view is that it is appropriate to address the impact of dividend imputation in the cash flows as such an approach allows for more flexibility in modelling different scenarios and also enhances transparency.

The issue of the applicability of tax and the tax status of the Burdekin are addressed in 5.10 below. In relation to MDCC's contention that dividends should not be paid, the Authority considers that the payment of a dividend is warranted as part of the return on capital. However, the Authority also notes that SunWater currently pays no dividend.

5.10 Determining the Tax Rate

The estimation of a post-tax nominal WACC requires the identification of the cost of tax either:

- as part of the WACC formula (see Appendix C); or
- as part of the cash flow (WACC3 in Appendix C is then applied).

In either case, it is necessary to determine the appropriate rate of tax to be applied.

In response to a report reviewing the tax system, the Federal Government announced on 21 September 1999 that it would reduce the company tax rate from 36% to 34% for the 2000-01 income tax year and to 30% thereafter. In addition, accelerated depreciation is to be abolished for tax purposes. In determining the tax rate to be applied, there are two broad alternatives, namely the statutory rate, or the effective rate. The effective tax rate adjusts the statutory rate for the timing of tax payments and differences in the tax position of certain assets.

The owner of infrastructure assets with a long life may claim a higher tax deduction in the early years of the assets' lives, where the period allowed for tax depreciation is less than the expected productive lives. Under these circumstances, the effective tax rate may be below the statutory rate.

Where tax is incorporated as a cost element in cash flows, the statutory rate is applied to forecast taxable income in order to determine tax payable, after allowing for appropriate deductions. If incorporated into the WACC, the effective tax rate should be used to avoid potentially over-compensating the service provider for tax liabilities incurred.

Other Jurisdictions

Tax rates in regulatory determinations in Australia have ranged from 30% to 36%, largely reflecting the timing of decisions.

Stakeholder Comment

BRIAC raised a number of issues questioning the validity of the tax equivalents regime applicable to Queensland statutory bodies. BRIAC also raised a number of issues regarding the amount of tax payable in the event that a tax equivalents regime was adopted. These related to measures designed to minimise the level of tax payable and included the use of prior tax losses and the creation of what BRIAC considered to be tax exempt structures.

QCA Analysis

The Authority does not accept the arguments raised by BRIAC against the tax equivalents regime. It is clearly open to the government to levy charges on statutory bodies equivalent to the tax that would be payable if they were subject to company taxation. In addition, there are valid competitive neutrality grounds for doing so, in that an objective of the reform of government business enterprises is to make them subject to the same disciplines that would apply if they were not in public ownership and were subject to competitive forces.

At the same time, the Authority accepts that a commercial entity would seek to minimise the level of taxation that it pays. The Authority has not given detailed consideration to the various tax minimising structures suggested by BRIAC as, because of carried forward tax losses, no income taxation is included in the maximum allowable revenue for the BRIA. At the same time, the Authority notes that no other commercialised, corporatised or privatised government business enterprise in Australia has adopted the suggested structures, despite tax being a significant issue for many of them.

As the Authority's approach is to incorporate any income tax liabilities based on statutory rates in the cashflow, no adjustment to WACC is necessary on account of income tax. The statutory tax rate used in the analysis was 30%. However, as indicated, there is no tax included in the cash flows due to carried forward tax losses.

5.11 Expected Inflation

In applying its preferred nominal post-tax approach, the Authority requires a projection for inflation over the regulated period. Four primary methods exist for the estimation of expected inflation:

- survey based methods, where market participants are surveyed to assess their expectations of inflation;
- statistical methods, using regression or time series models;
- models based on the Fisher Theory of Interest (1907), which suggests that there is a systematic relationship between nominal interest rates, real interest rates and the expected rate of inflation. Using this theory, the level of expected inflation is implied from the yields on nominal and Commonwealth Treasury capital indexed bonds; and
- the use of secondary sources, including monetary and fiscal policy documents. For example, the Reserve Bank of Australia's medium term inflation target is 2 to 3%. Similarly, in forecasting future revenues, State and Commonwealth governments report anticipated CPI as part of their budgets.

Other Jurisdictions

The ACCC (2000a) stated that it is appropriate to derive the expected inflation parameter from the difference between Commonwealth and indexed bond rates.

IPART has calculated inflation by reference to the difference between the ten year Commonwealth bond rate and the relevant indexed bond rate. GPOC (2001) also used this method.

Stakeholder Comment

No comments were received on this matter.

QCA Analysis

The estimate of inflation used in the determination of the price paths was 2.5%. This seems reasonable, given the economic circumstances at the time. To ensure consistency with the figures used in the price path, which the Authority is directed to use, an inflation rate of 2.5% is proposed.

5.12 Other Methodological Issues

As part of SunWater's response to the Draft Report, the NECG assessment raised a number of issues related to the cost of capital. These included:

- the market risk premium;
- assessment of beta;
- adjustments for international beta comparisons;
- factors affecting SunWater's asset beta;

- comparisons with other regulatory decisions; and
- the case for beta adjustments.

These matters will require research and consideration by the Authority given the applicability of many of them to all sectors covered by the Authority. This is not possible within the reporting deadline for this current assessment. It should be noted, however, that to the extent that the Authority eventually accepted any of NECG's comments, the cost of capital for SunWater would increase. This would increase the gap between the maximum prices consistent with a full return on capital and the current price path prices. As such, it would have no material impact on the Authority's conclusions in this assessment.

5.13 Conclusions

It is therefore proposed to use the Authority's assessed WACC of 8.27%.

6. EXCESS RETURN ON CAPITAL

Summary

The Ministers' Direction requires the Authority to determine whether the gazetted price paths for the Burdekin River Irrigation Area incorporate any excess return on capital, based on the Authority's analysis of asset values, capital contributions and the weighted average cost of capital.

For this purpose, the Ministers' Direction specified that the Authority should use the lower bound costs of the Scheme incorporated in the gazetted price paths.

On the basis of its estimates of depreciated optimised replacement cost, capital contributions and weighted average cost of capital, the Authority considers that the gazetted price paths did not incorporate any excess return on capital as at October 2000.

6.1 Lower Bound Costs

The Ministers' Direction specified that, for the purpose of determining any excess return on capital, the Authority should use the lower bound costs of the Scheme incorporated in gazetted price paths.

Stakeholder Comment

BRIAC submitted that the Authority should determine whether an excess return on capital exists by using efficient lower bound costs, rather than the lower bound costs incorporated in the gazetted price paths:

... the QCA is not “bound” to accept lower bound costs as applied in setting the gazetted price paths. While it is sensible to “use” the lower bound as applied for the gazetted price paths this can only sensibly mean that the lower bound is to be taken as a starting point for inquiry rather than conclusive evidence of what are efficient lower bound costs. Logically, the lower bound costs assumed to date have to be open to examination in auditing the price paths for excess returns on capital, else the inquiry would be futile...

BRIAC noted that:

- a Marsden Jacob Report (2000), commissioned by the Burdekin Interim Local Management Committee, ‘strongly argues that efficient opex is considerably below that identified by the Water Reform Unit’; and
- benchmarking studies conducted by the WRU showed that corporate overheads of SWP (a predecessor of SunWater) were above those of Goulburn-Murray Water and Southern Rural Water.

BRIAC also commented on the appropriateness of individual elements of the lower bound (including return of capital, tax equivalents, externalities, and labour costs including accrued superannuation entitlements) and the allocation of lower bound costs across users.

The North Burdekin Water Board also submitted that the Authority should use efficient costs to determine the excess return on capital within the gazetted price paths.

Davco Farming submitted that the operating and management costs of the Scheme were above efficient levels and that the corporate overhead costs of the Scheme were particularly high

compared to relevant benchmarks. Davco Farming submitted that local management of the Scheme could significantly reduce the price of water to Burdekin irrigators.

BRIAC also subsequently submitted that the Authority has omitted all mention of the fundamental problems which BRIAC identified in the Green-Edwell Report.

QCA Analysis

The Ministers' Direction and accompanying Ministerial correspondence clearly requires the Authority to accept the lower bound costs incorporated in the gazetted price paths as a given. The Authority does not consider that it has a discretion in this area. This also precludes the Authority from assessing whether local management would result in a decrease in lower bound costs.

Insofar as there are any concerns about the relevance of lower bound costs, it is noted that:

- SunWater must comply with the requirements of the COAG pricing agreements, the *GOC Act 1993*, its own SCI, and the monopoly prices oversight provisions of the *Queensland Competition Authority Act 1997*;
- under relevant COAG pricing principles, full cost recovery for rural water schemes is defined as falling within a range of outcomes:
 - an 'upper bound' – which is defined as the recovery of the costs of operation, maintenance and administration, regulatory compliance, asset consumption, taxes and return on capital, the latter calculated using a WACC; and
 - a 'lower bound' – which is defined as the recovery of the costs of operation, maintenance and administration, regulatory compliance, refurbishment of assets, taxes, interest and dividends (if any); and
- a commercial service provider could continue to maintain its service provision where all operations, maintenance and administration costs are met and the service potential of assets is maintained. Any less revenue than this would result in the cessation of business activity over time. This level of revenue aligns with the concept of a lower bound as defined under COAG pricing principles.

The Green-Edwell Report, and BRIAC's comments on this report, were provided to the Authority on a confidential basis. The Authority is required to ensure that material claimed as confidential is treated in accordance with the *Queensland Competition Authority Act 1997*. Relevant matters have, however, been taken into account and addressed where appropriate. To the extent that the Green-Edwell Report and BRIAC's comments related to lower bound costs, these are beyond the scope of the Ministers' Direction and the Authority's assessment.

6.2 The Return on Capital within the Gazetted Price Paths

Methodology

To establish whether the gazetted price paths incorporate any excess return on capital, based on the Authority's analysis of asset values, capital contributions and weighted average cost of capital, the Authority has:

- identified the net revenues associated with the current price paths and subtracted from these the lower bound costs. See Table 6.1; and

- established the net maximum allowable revenue consistent with the Authority's estimates of the DORC value of Scheme assets not accounted for by capital contributions of \$200.6 million (Chapter 4) and the appropriate WACC of 8.27% (Chapter 5). See table 6.2.

QCA Analysis

Where the net maximum allowable revenues associated with the Authority's DORC and WACC (estimated in Table 6.2) exceed the net revenue associated with gazetted price paths (Table 6.1), then there is no evidence that there is any excess return on capital in the gazetted price paths. All tables refer only to the Scheme irrigators currently serviced by SunWater.

Table 6.1: Net Revenues Based on Gazetted Price Path^a (\$ thousand)

	2000-01	2001-02	2002-03	2003-04	2004-05
Aggregate Revenue	10,679	10,946	11,272	11,554	11,822
Aggregate Lower Bound Costs	8,649	8,814	8,954	9,077	9,151
Net Revenues Above Lower Bound	2,030	2,132	2,318	2,477	2,671
Allocation of Net Revenue to Channel Irrigators	1,283	1,364	1,543	1,698	1,870
River Irrigators	161	167	172	179	186
Other Irrigators	586	601	603	600	615

^a Does not include drainage revenues or costs and assumes an inflation rate of 2.5%

Table 6.2: Net Maximum Allowable Revenues based on Authority's DORC and WACC^a (\$ thousand)

	2000-01	2001-02	2002-03	2003-04	2004-05
Aggregate Revenue	19,584	20,074	21,241	22,181	22,736
Aggregate Lower Bound Costs	8,649	8,814	8,954	9,077	9,151
Net Maximum Allowable Revenue	10,935	11,260	12,287	13,104	13,585
Allocation of Net Maximum Allowable Revenue to Channel Irrigators	9,448	9,734	10,720	11,495	11,931
River Irrigators	646	663	682	701	722
Other Irrigators	841	863	885	908	932

^a Does not include drainage revenues or costs and assumes an inflation rate of 2.5%

The net maximum allowable revenue based on the Authority's DORC and WACC is higher than that which results from the gazetted price path. The rate of return recouped by SunWater from gazetted prices is less than 1% on the relevant capital base.

Some factors identified in Chapter 7 as being relevant to the price charged to users may require an adjustment to the revenues received by SunWater from sugarcane growers. However, the terms of reference for this assessment only allow the Authority to determine any excess return on capital based upon the Authority's analysis of the capital unaccounted for by capital contributions and the relevant WACC for the Burdekin Scheme.

6.3 Conclusions

On the basis of its estimates of the DORC and WACC as at October 2000, the Authority considers that the gazetted price paths do not incorporate any excess return on capital.

7. APPROPRIATENESS OF POSITIVE RATES OF RETURN ON ASSETS

The Ministers' Direction requires the Authority to advise under what circumstances it would be appropriate for an entity to charge a positive rate of return on scheme assets. While the Authority has sought to address this issue in a generic manner, it has also sought to reflect the submissions of stakeholders which have focussed on the Burdekin Scheme.

Corporatised entities, such as SunWater, are required to operate on a commercial basis and to enhance the value of their business to shareholders. Accordingly, such entities should only invest in new projects when a full commercial rate of return is considered to be achievable. Matters of a broader public interest nature should be addressed through the payment of transparent community service obligations by Government. Similarly, after an investment has been made, such entities should seek to achieve a full commercial return, although circumstances may be such that, although it was considered to be achievable at the time of investment, it may no longer be achievable.

Given the general proposition that entities should always seek to achieve a full commercial rate of return, the Authority has sought to identify those circumstances when a full commercial rate of return may not be desirable or achievable. Circumstances when it may not be appropriate for an entity to charge a full commercial rate of return include:

- *when transitioning users to more commercial rates of return;*
- *when contractual or legislative constraints exist;*
- *during periods of substantial excess supply;*
- *where there are redundant or over-engineered assets in the asset base;*
- *where capital contributions should be recognised;*
- *a number of situations when differential prices would be possible but not appropriate;*
- *when broader public interest matters determined by government are reflected in CSOs; and*
- *where market circumstances limit the capacity of users to pay.*

While it is accepted that the issue of a return on capital was not discussed during the period leading up to the commencement of the Scheme, irrigators were or should have been aware, that irrigation charges could increase in the future. Furthermore, in the absence of any actual or implied contractual arrangements, the government has the power to alter existing pricing arrangements even though they may adversely impact on a particular individual or group of individuals.

The Authority notes that under prevailing current and expected prices for sugar, sugarcane irrigators in the BRIA do not, on average, have a capacity to pay a full commercial rate of return on capital. However, within the current government approach of fixed price paths, it is not appropriate to automatically seek to reduce prices to accommodate a reduction in irrigators' capacity to pay from when the prices were initially set. In this regard, it must be recognized that capacity to pay is a two-sided coin and the current approach sets prices for a period and those prices can not be varied upwards within that time period if capacity to pay improves. At the same time, it is also noted that it is common for regulatory regimes to include a trigger mechanism under which a review of pricing would be initiated when certain defined circumstances materially change from those prevailing at the time that prices were initially set.

The Authority also notes any reduction in prices for water services to remove the current excess over lower bound costs will only reduce costs of sugarcane production in the BRIA by 2 to 3%. Such a reduction would obviously be of assistance to sugarcane producers in the current circumstances, but a more comprehensive response to the situation within the industry is required. The nature and form of any assistance and related adjustment is a matter for government and industry to determine rather than SunWater in its capacity as a commercial service provider.

It should also be noted that prices to irrigators in the Burdekin have not changed in real term since 1980, although the structure of prices changed in October 2000 with a higher fixed component and a lower volumetric charge.

7.1 Introduction

In responding to the Ministers' Direction to advise under what circumstances it would be appropriate for an entity to charge a positive rate of return on scheme assets, the Authority has sought to also take into account submissions received in respect of this issue as they relate to the particular circumstances of the BRIA. This issue has been assessed against the framework established in previous chapters.

The Authority also notes that this issue has a significant temporal dimension. In particular, there is the issue of when it is appropriate to seek a positive rate of return before an investment is made and when it is appropriate to do so after the investment has been made. A further issue is whether a positive rate of return should be sought annually or on some other basis (for example, a whole of investment basis).

7.2 Before the Investment

No submissions were initially received by the Authority on the issue of whether a positive rate of return should be applied to new investments. Submissions focussed on the current circumstances relating to the BRIA and thus related to the issue of whether a rate of return should be achieved after an investment has been made.

Under the *GOC Act 1993*, corporatised entities are required to be commercially successful (s 20 (1)) and to act in accordance with their SCI (s 92(b)). For example, SunWater's SCI requires it to increase the value of the business to its shareholders, and it is free to do so by investing in commercially viable projects.

As noted in Chapter 4, for any new projects, a commercial service provider will seek to achieve a commercial rate of return on the full value of the assets to be employed. This will ensure that services are provided on a sustainable basis with consumers paying, and investors receiving, prices consistent with the ongoing delivery of services.

Such an approach is consistent with the requirements of COAG, where clause 3(d)(iii) requires that future investment in new schemes is to be undertaken only after appraisal indicates that it is economically viable (and ecologically sustainable).

However, corporatised entities may also have non-commercial regulatory obligations which are relevant to the return the entity seeks to recover from prices for its services. In such cases, a CSO is required to be specified in the SCI of the entity. COAG also provides for CSOs and requires these to be made on a transparent basis. In some cases, broader public interest objectives may be achieved through the establishment of an appropriate legislative framework.

Taking all the issues into account, the Authority considers that a full commercial rate of return should be sought by corporatised service providers such as SunWater when undertaking new investments. Should the Government wish such entities to address issues of a broader public interest nature, on the basis of the Government's assessment of expenditure priorities and community needs, these should be addressed through the payment of transparent CSOs, of either a capital or recurrent nature, or by the establishment of an appropriate legislative framework.

7.3 After the Investment

As noted in Chapter 4, an entity may not always be able to achieve a positive rate of return after an investment has been made, as a result of changing market conditions including the capacity of users to pay. As outlined in 7.2, the *Government Owned Corporation Act 1993*, one of the key objectives of a corporatised entity is to be commercially successful. The Act does not limit this objective to new schemes.

Furthermore, under the COAG Water Resource Policy, rural water schemes are required to achieve positive real rates of return on the written down replacement cost of assets, wherever practicable. This policy thus recognises that a full commercial rate of return may not always be achievable but should be pursued 'wherever practicable'.

Stakeholder Comments

Stakeholders raised a variety of reasons why, and circumstances in which, they considered it was inappropriate to achieve a positive rate of return on scheme assets. Invariably, these comments related to the Burdekin although the Direction from the Ministers was more generic. In addition, there are circumstances not raised by stakeholders in which a positive rate of return may not be appropriate. These issues are addressed in 7.4 below.

Stakeholders also raised a number of circumstances where a rate of return would not be applicable as there was no asset base to which it could be referred. In particular, these related to sunk costs and capital contributions. These matters have been addressed in earlier sections.

BRIAC, in responding to the Draft Report, argued that :

- SunWater should not seek to maximise its shareholder value as maximising the rate of return on assets in the case of a monopoly necessarily involves inefficient and destructive monopoly pricing; and
- Parliament cannot have intended that taxpayer funded assets be used in this way, as this would be granting a licence to tax. BRIAC contended that SunWater is not a normal commercial entity operating in a competitive market but a creature of statute, operating as a public utility enjoying a natural monopoly and funded by taxpayers.

QCA Analysis

The Authority notes that the *GOC Act* requires SunWater to be commercially successful – in other words, to maximise shareholder value. At the same time, monopoly price regulation will ensure that SunWater's revenues do not exceed the maximum that could be achieved in a competitive market, thereby ensuring that SunWater can not engage in monopoly pricing. In addition, the capacity of irrigators to pay will provide a commercial limit to the capacity of SunWater to maximise its return on assets.

7.4 Circumstances When Not Appropriate to Charge a Full Commercial Rate of Return

As outlined above, SunWater should always seek to achieve a full commercial rate of return – whether it be for a new or existing investment. However, there are a number of circumstances under which the full commercial rate of return – that is, the rate consistent with a maximum allowable return – may not be appropriate. These circumstances are outlined below.

Transition Paths

When there are changes in the capacity of users to pay, or where charges to users do not appropriately reflect the costs needed to provide an appropriate return to the service provider, the price increases needed to maximise the return to the service provider may be significant – and may have the potential to adversely impact on users, at least in the short term.

Therefore, in such circumstances, it may be appropriate for a service provider to moderate its desire to maximise the return on its assets and provide for any price increases to be staged in a manner that allows users sufficient time to adjust. The rural water price paths adopted by the government are consistent with this approach.

Contractual and Legislative Constraints

Contractual and legislative constraints can limit the achievement of positive or higher rates of return. This is accepted as a given by the Authority.

Stakeholders Comments

Submissions have been received from certain stakeholders that SunWater should not be able to charge BRIA irrigators a rate of return in respect of its Burdekin assets for a variety of legal and policy reasons. In summary, the arguments raised in this regard are as follows:

- the government’s past policies in respect of water pricing limit the government’s capacity to change water prices in the future to include a rate of return;
- apart from the policy constraint referred to above, there are specific legal constraints that prevent SunWater from charging a rate of return. In particular, legislation prohibiting misleading or deceptive conduct, equitable estoppel and negligent misstatement. In addition, a private sector entity in SunWater’s position would be legally prohibited from charging a rate of return; and
- as irrigators were not explicitly advised at auction that a rate of return would be charged, a rate of return should not now be charged.

These arguments are outlined in more detail in the Addendum to this chapter, together with a detailed analysis by the Authority.

QCA Analysis

The Authority accepts that that the issue of a return on capital was not discussed during the period leading up to the commencement of the Scheme. In addition, the Queensland Government has not always clearly articulated its future pricing policy, particularly in respect to matters such as the rate of return on capital. However, for the reasons outlined in more detail in the addendum to this chapter:

- in the absence of any actual or implied contractual arrangements, the government has the power to alter existing pricing arrangements even though they may adversely impact on a particular individual or group of individuals. The Authority’s legal advice is that, following a review of past and current water legislation and the representations made by the State during the relevant period, the relevant Ministers are not constrained in specifying water charges for BRIA irrigators and that they have a broad discretion in setting such charges. This broad discretion includes the ability to require that SunWater recover a rate of return in such charges;
- on the basis of legal advice received, the Authority has concluded that there does not appear to be any evidence to support general claims for:
 - misleading or deceptive conduct [as the material in the auction kits did not create the impression that the Government guaranteed not to increase water charges to include a rate of return at any time in the future];
 - equitable estoppel [as the representations in the auction kits did not amount to a ‘promise’ that water charges would not be increased in the future to reflect a rate of return]; or
 - negligent mis-statement [as it is not evident that the information provided by advisers breached their duty of care].

Furthermore, the Authority considers that the same general conclusions would apply in relation to a private sector service provider in the same circumstances; and

- irrigators were or should have been aware, that irrigation charges could increase in the future. In this regard, while there was no clear statement from government that a rate of return would be charged, it was evident that governments were changing their direction in respect to pricing towards more commercial pricing practices. Initially, such statements related to the Queensland Government seeking in excess of local costs of operation and maintenance, and more recently took the form of national agreements under COAG to include a rate of return, where practicable. The earlier advices were forwarded to grower representatives in December 1987 and again in October 1988. The first auction sales of land in the BRIA were undertaken in March 1988.

Excess Supply Capacity

The pricing approach to regulated assets seeks to establish a scale of infrastructure which is appropriate to current and prospective demand. Nevertheless, for certain periods excess supply may arise. This will particularly be the case if a facility has been constructed that is substantially in excess of the optimum.

In these circumstances, short term variations in commercial pricing, with consequent impacts on the rate of return, may be justified to ensure that the maximum volume of water is available to the community. This may include the sale of water without seeking to recover any return on capital. This is appropriate provided no users who are willing to pay more are excluded and the sale has no longer term impact on the security of supply for other users.

Redundant or Over-engineered assets

Stakeholder Comments

BRIAC have consistently supported a reduction in the rate of return and in particular they raised several concerns relating to redundant or over-engineered assets. More specifically, BRIAC submitted that in a monopoly market it is not appropriate to charge a market based rate of return for capital expended because this may include excess capital expenditure or ‘gold plated’ works.

QCA Analysis

The Authority agrees that it is inappropriate to seek to recover a positive rate of return on such assets. In fact, the whole process of asset optimisation is designed to identify and remove any such assets from the asset base for pricing purposes.

Capital Contributions

Stakeholder Comments

BRIAC raised a number of concerns in regard to the issue of capital contributions. This issue was addressed in detail in Chapter 3.

QCA Analysis

In general, it is considered inappropriate for the asset owner to charge users a positive rate of return on capital contributions that have been made. Further, as outlined in Chapter 3, capital payments should be regarded as capital contributions (and thus reflected in the prices paid by users of the asset) if it was the expectation of the relevant parties at the time that the capital payment would be recognized for pricing purposes, provided that users have not already been fully compensated through lower historical prices or the relevant assets have not been consumed.

Differential Pricing

Because different users may have different capacities to pay, charging users different prices may enhance the capacity of an entity to maximise the return on Scheme assets. This can involve different prices to similar users of the same services, different prices to different users of the same services, different prices for new users compared to those paid by existing users and different prices between schemes for the same services.

Stakeholder Comments

Stakeholders have also commented upon this issue, as follows:

- SunWater submitted that the Authority should take account of the existing differences in the water services provided to users, and the existing geographic grouping of users within gazetted prices;
- BRIAC argued that:
 - if other pre-existing users were charged a lower price which reflected a lower rate of return, this advantage should be extended to all pre-existing BRIA users;
 - if users in other schemes are charged lower prices involving lower rates of return, this advantage should be extended to all BRIA users; and

- it is not appropriate to charge a rate of return on irrigation schemes inconsistently and in a discriminatory manner within an existing irrigation scheme.
- other stakeholders, including Davco Farming and the South Burdekin Water Board, noted that different users were reliant upon different infrastructure in the Scheme.

QCA Analysis

Differential pricing which reflects differences in the cost of service provision can provide important incentive signals for growers in choosing the appropriate location for their enterprises or their appropriate service level. The Authority therefore considers that prices which reflect differences in service quality and costs are appropriate, provided these factors can be meaningfully disaggregated and the administrative costs of doing so are warranted. In the current circumstances, price differentiation between channel, river and other BRIA users is recommended on the basis of the availability of specific cost information for each and that it reflects the different infrastructure requirements of each group.

In respect of the issue of existing users and new users, the Authority considers that prices between new and existing users should not be differentiated as:

- competitive markets do not differentiate between users according to whether they are existing or new users (unless contractual obligations exist); and
- water is a resource with few, if any, substitutes and all users, existing and prospective, are able to adjust their consumption to reflect the availability of water and related costs.

Following on from this point, the Authority does not consider that it is valid to charge lower prices to pre-existing users simply because other pre-existing users have obtained a lower price through contractual or other negotiations.

In respect of BRIAC's concerns regarding differentiation in rates of return between schemes, the Authority considers that differentiation in pricing between schemes is acceptable where it reflects identifiable costs associated with each scheme. Such cost reflectivity is consistent with key pricing principles (see for example the Authority's *Statement of Regulatory Pricing Principles for the Water Sector*, QCA 2000a). In addition, it is reasonable for there to be differences in ex post returns between schemes where there are differences in the capacity to pay, provided that no monopoly rents are involved.

So far as different users of the same services are concerned, there is no economic objection to charging different prices based on different capacities to pay provided prices do not involve monopoly rent seeking. Indeed, taking a longer-term view, the EV of the Burdekin Scheme may not depend on the current commercial position of the sugarcane growing sector (presently the predominant user of water), but on future uses that might emerge for water and SunWater's ability to capture higher prices (and greater EV) from these users. In addition, the situation could arise where users willing to pay a higher price could be seeking water currently used by sugarcane producers. However, this is not likely to be of significant concern to the Burdekin as:

- SunWater holds an IWA of some 184,241 ML in the Burdekin Scheme that is currently unutilised;
- the advent of water trading may itself provide a means for prices to adjust appropriately; and
- no allocations of water have been sold since the gazetted price paths (for ongoing water supply) were established in October 2000.

In any case, such a situation would be likely to involve broader adjustment and public benefit issues which cannot be effectively considered without a specific case to consider.

In respect of similar users of the same services, it is not generally considered to be appropriate to charge differential prices. This reduces the incentives available to the more productive users of a service, as their greater returns are targeted, often to support the lower return from less efficient competitors. Moreover, it may be difficult to identify differences in the capacity to pay between individuals and this situation may fluctuate markedly over time depending on individual circumstances.

In summary, charging users different prices may enhance the capacity of an entity to achieve a more commercial rate of return. Where differential prices are not achievable or appropriate, an entity may be unable to achieve a full commercial rate of return.

The Public Interest

The Authority accepts that the activities of commercialised entities such as SunWater may have public interest implications. Furthermore, the Authority accepts that it may be efficient in a macroeconomic sense to promote activities which benefit the public interest. However, it is considered that these benefits can best be assessed by the Queensland Government, after appropriate consideration of its expenditure priorities, through the payment of transparent CSOs rather than through adjustment to the effective rates of return for commercialised entities.

So far as regional development in particular is concerned, the Burdekin region has a population of approximately 19,000 with the principal towns being Ayr and Home Hill. Within the Burdekin region, the sugar industry is the dominant employer and wealth generator, and any significant downturn in the industry is likely to have a major impact on local economic activity, employment and social cohesiveness. For example:

- using sugar cane processed by the Invicta Mill as a guide for BRIA production, as value of production data specific to the BRIA is not available, at least 40% of the total value of agricultural production in the Burdekin region comes from sugar cane produced in the BRIA;
- cane growing accounted for 63% of employment in agriculture or 16% of total regional employment. Sugar manufacturing was the second largest employer in the region, accounting for 74% of all manufacturing employment or 11% of total employment (ABS 1996 census employment data);
- the sugar industry has significant flow-on effects throughout the regional economy. Available statistics indicate that these linkages are particularly significant to ‘other agriculture’, finance, property and business services industries; and
- the provision of local government infrastructure and services depends upon the Burdekin Shire Council raising sufficient revenue through council rates and charges. In the Council’s recent submission to the Independent Assessment of the Sugar Industry (the Hildebrand Report), it stated that approximately 62% of its rate revenues were attributable to cane farms and mills and that the Burdekin Shire Council is more reliant on rate revenues from the sugar industry than any other local government authority.

It is clear that the dependence of the region upon sugar poses particular problems. In this regard, it may be that a critical mass of users is required to justify a minimum level of services in regional centres and, if irrigators are unprofitable and withdraw from the industry, this would penalise other efficient producers who are located in the same region. However, these are issues more appropriately addressed by the Government and not SunWater.

Stakeholder Comments

BRIAC also stated that the original decision to construct the Scheme was based upon a conventional cost benefit analysis in which broader public interest matters were taken into account. BRIAC also argued that it is not appropriate to charge a rate of return on Scheme assets where those assets were created as a result of past government and parliamentary social policies, rather than being demand-driven by those willing to pay.

Furthermore, BRIAC stated that the network infrastructure investment in the Burdekin Scheme:

- provides benefits not only in terms of the land values of farms in the designated irrigation area, but also in terms of farms, towns and people in the surrounding area, including Townsville. These benefits extend to the State and the Commonwealth; and
- has a multiplier effect, which results in more tax revenue for the Government as it:
 - increases the productivity of other industries, which often generates further revenues for Treasuries from the increased output of downstream industries; and
 - generates regional economic growth, which provides other external benefits to the Government through enhanced tax collections (eg land tax, rates, payroll taxes, goods and services tax); and
- has benefits that are often reflected or captured in the form of location rents of land, as recognised by the Burdekin Scheme land resumption and resale financing process.

The QFF noted that broader community benefits should be recognised through the provision of transparent subsidies.

Davco Farming stated that the State and Federal Governments are obliged to promote rural and regional development to correct capital imbalances created by:

- the legislated diversion of rural and regional income to superannuation funds which ‘is spent on centralised office fees and is invested in centralised stock, property and capital markets’; and
- the centralised location of State and Federal bureaucracies, and large private company head offices, in major cities. Davco noted that SunWater’s head office was located in Brisbane.

BRIAC also contended that the national competition policy payments received by the government should be used to compensate irrigators for changes in policy which occurred after irrigators had purchased farms.

QCA Analysis

In response to the specific issues raised by stakeholders, the Authority:

- accepts that, where a Scheme was constructed in the past on the basis of broader benefits to the community, it is necessary to ensure that the rate of return only relates to those assets driven by demand. In addition, the Authority notes that current prices seek to recover a return on only a portion of DORC;

- notes that acceptance of the argument that a particular activity generates other benefits to the economy which can then be taxed would see all activities in the economy subsidised; and
- notes that all activities have linkages with other parts of the economy and therefore generate flow-on benefits or ‘multiplier’ effects. These flow-on effects do not necessarily equate to increases in economic welfare as multipliers do not:
 - address the question of whether the benefits of increased activity in one area outweigh the costs; or
 - evaluate the economic merits of other investment options.

On these latter two matters, it is worth noting that the 1980 report to Parliament, which listed significant secondary benefits derived from input-output analysis, stated that these benefits relating to the Burdekin Scheme did not represent a net benefit to the State:

‘The secondary benefits outlined below should not be seen as an indication of the level of net benefit to the State. Any part of the capital or operating costs which, in the absence of the proposed scheme would be expended in some other way elsewhere in Queensland would also be the subject of multiplier effects. The net State benefit would be represented by the difference between the secondary benefits accruing from the proposed scheme and the potential secondary benefits which might otherwise be realised. The secondary estimates outlined below, should, from a State point of view, be interpreted as gross estimates only.’

In respect of BRIAC’s claims relating to the application of NCP payments, the Authority considers that payments provided for the implementation of COAG reforms should not be used to avoid the implementation of those reforms, as suggested by BRIAC. However, this would not stop the use of these funds to effect the structural adjustment that in the implementation of competition reform may be deemed to be required for the public interest. However, this is a matter for government.

Where it is determined that in the public interest prices to customers should be less than those that would be set commercially, it is appropriate that a CSO be paid to SunWater for the difference between the commercial price and that sought to achieve the public benefit. Alternatively, these goals may be achieved through legislation. In respect of CSOs, it is noted that:

- many activities have indirect effects on third parties, and these can be quite diverse;
- only some activities are generally considered to warrant government intervention in a market. Typically cited examples include regional development, environmental considerations and equity;
- many of these effects are not normally taken into account by commercial service providers, as it is generally not their role to address broader community requirements and priorities; and
- government is responsible for addressing broader public interest matters and is best placed to do so, having regard to the net benefits and its expenditure priorities.

Capacity to Pay

Stakeholder Comments

The North Burdekin Water Board stated that it is inappropriate to charge a rate of return given current international sugar prices. These conditions include international pressures facing the sugar industry due to ‘protectionist policies by the EEC and the USA and the massive increase in sugar production achieved by Brazil in recent years’.

QCA Analysis

The Authority accepts the North Burdekin Water Board’s submission that the capacity to pay should be taken into account in setting prices – indeed, capacity to pay may preclude any rate of return being achieved or limit the achievement of a full commercial rate of return.

The Authority also accepts the submissions of CANEGROWERS and MDCC that the elasticity of demand is relevant to pricing.

In the case of the Burdekin, in the absence of material alternative customers, SunWater is dependent upon the capacity of sugarcane producers to pay.

As in most commodity industries, the actual and expected capacity of sugarcane producers to pay will vary significantly over time. Figure 7.1 below shows historical prices for sugarcane and compares alternative scenarios identified by the Hildebrand Inquiry for the next 30 years. Figure 7.2 shows changes in ABARE forecast and projected prices since 2000 when price paths were established.

Figure 7.1: Historical Real Sugar Cane Prices

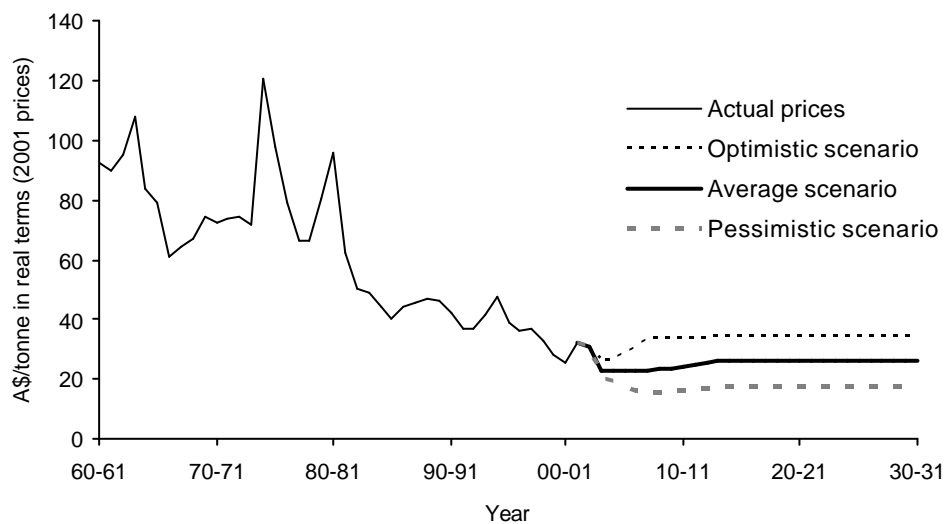
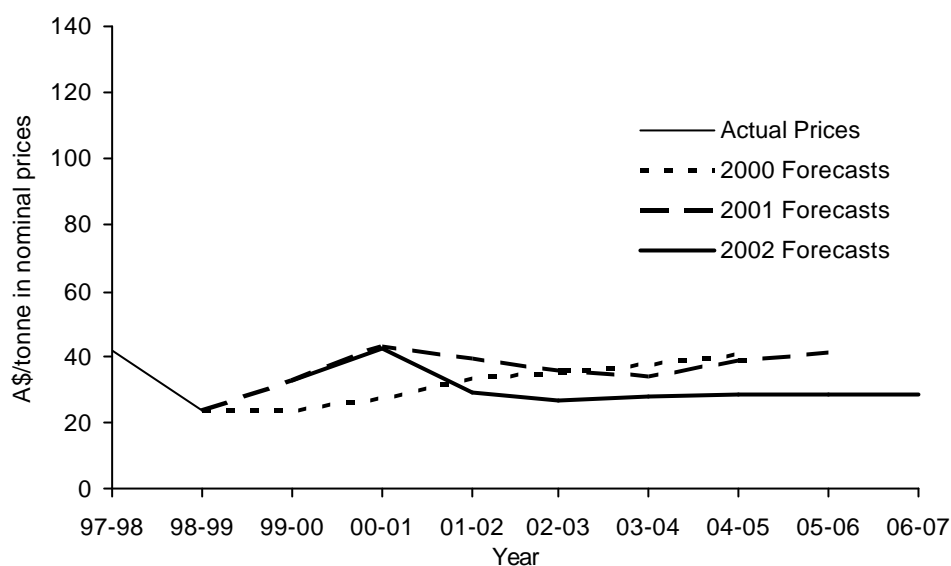


Figure 7.2: Forecasts of Sugarcane Prices based upon ABARE Forecast Sugar Prices

Against this background, it is evident that the actual and expected capacity of sugarcane producers to pay has varied significantly over time. There are also a wide range of estimates of expected capacity to pay when the forecasts and projections established for the purposes of the Hildebrand Inquiry are considered. In this regard, Table 7.1 outlines estimates of the expected capacity of sugarcane producers to pay for water, based on an assessment of their EV. As outlined in Chapter 4, it is stressed that not all of the expected capacity to pay as measured by the users' EV is available to meet water charges. BRIA users also have capital invested on which a rate of return is desired. As such, the users' EV represents the capacity of users to pay a return on the capital of both SunWater and the users themselves. An obvious issue for consideration is the sharing of any users EV between SunWater and the users.

Table 7.1: Users EV based on various price assumptions (\$m)

August 2002 – Hildebrand Average Scenario (\$25/tonne)	8
August 2002 – Hildebrand Optimistic Scenario (\$35/tonne)	480
October 2000 international spot price	775
August 2002 international spot price	0

Based on a continuation of current price expectations, it is clear that sugarcane producers do not have the capacity to pay a positive rate of return on capital. This conclusion also holds under the average scenario developed for the Hildebrand enquiry. This is the case because the projected prices are lower than the current costs of average BRIA canefarmers. However, this is not the case if the Hildebrand optimistic scenario prevails. At the same time, history has shown that there is considerable volatility in sugarcane prices, including forward estimates of sugarcane prices, as outlined above and in Chapter 4, rendering any forecast of capacity to pay somewhat problematic.

The question therefore arises as to whether the expected low capacity to pay should result in a reduction in the positive rate of return to SunWater implied by current price paths, which have been established to apply until June 2005. BRIAC have consistently supported such a view.

In this regard, it is noted that a commercial service provider would, in general, only provide a price adjustment for a customer where a failure to do so would affect the longer term viability of the service provider. Such a circumstance may arise if commodity prices on international

markets fall sufficiently so that the current nature and level of farming activity is unprofitable in the longer term.

For a number of regulated entities, prices are set for a five year period, as are rural water price paths. Where revenues to the service provider either exceed or fall below those regulated prices by a designated amount (for example 15%), the price paths are typically revisited.

There is clear evidence that the industry faces severe difficulties which may have long term implications. In this regard, a recently released survey of Queensland rural debt undertaken by the Queensland Rural Adjustment Authority indicates that:

- debt servicing costs for sugarcane growers have increased considerably over recent years; and
- there has been significant downgrading of sugarcane growers' debt, with the majority of debt held by sugarcane farmers in the Tropical North region now rated B+ ("borrowers who are considered potentially viable long-term but are experiencing debt servicing difficulties") and B- ("borrowers who are experiencing debt-servicing difficulties and a deteriorating debt situation but with continuing support from lenders").

The Authority notes submissions by BRIAC that:

- the application of a rate of return on capital which would force water users out of business may not be appropriate;
- it is better for society to partly subsidise a productive activity than to wholly subsidise a wholly unproductive activity; and
- wherever the cost to the taxpayer of unemployment benefits exceeds the cost of any subsidy (implied by the absence of a rate of return component), subsidisation is preferable and that this is likely to be the case 'in a second best world where labour and resources are not perfectly mobile'.

The Authority notes that the expected capacity of sugarcane producers to pay has exhibited considerable volatility in the past and may do so in the future. The Authority also notes that, given that volatility, point in time estimates of expected capacity to pay based on estimates of future prices are necessarily quite problematic and caution needs to be exercised when using them for pricing purposes.

As the current price paths are based on the current government approach of fixed price paths, they do not provide a mechanism by which SunWater can capitalise on any improvements in capacity to pay, and thus it would be inappropriate to reduce the return when the expected capacity to pay is low. The situation would be different if SunWater had a more market based pricing policy which sought to share in industry highs and lows with other participants in the industry, while at the same time ensuring that industry retained a strong incentive to increase its returns. This is of course an option for future price paths.

In addition, the Authority notes that the return to SunWater above lower bound only accounts for 2 to 3% of the costs of sugarcane production in the BRIA. While such a reduction in prices would obviously be of assistance to sugarcane producer in the current circumstances, a more comprehensive response to the situation within the industry is required.

The nature and form of that assistance and any related adjustment is a matter for the Queensland Government and the industry to determine rather than SunWater in its capacity as a commercial service provider. Where the Queensland Government may wish a lower price to apply than that

which SunWater can obtain as a commercial service provider, then, as noted above, SunWater should be in receipt of an appropriate CSO to make up the difference.

7.5 Conclusions

Thus, on the basis of current Government policy and the Ministers' Direction, the Authority considers that:

- SunWater is able to charge a rate of return in irrigation water charges for BRIA irrigators; and
- in calculating the maximum allowable revenues that may be achieved by SunWater in the BRIA, a rate of return component should be included, calculated using the weighted average cost of capital.

At the same time, however, the actual prices charged by SunWater should have regard to a variety of factors, including the capacity of users to pay.

A corporatised or commercial entity (whether it is SunWater or a sugarcane grower) should always seek to achieve a commercial, and therefore positive, rate of return. Circumstances when it may not be appropriate for such an entity to charge a positive rate of return (or a fully commercial rate of return) include:

- when transitioning users to more commercial rates of return;
- when contractual or legislative constraints exist;
- during periods of substantial excess supply;
- where there are redundant or over-engineered assets in the asset base;
- where capital contributions should be recognised;
- a number of situations when differential prices would be possible but not appropriate;
- when broader public interest matters determined by government are reflected in CSOs; and
- where market circumstances limit the capacity of users to pay.

ADDENDUM TO CHAPTER 7

Detailed Review of Contractual and Legislative Constraints

Submissions have been received from certain stakeholders that SunWater should not be able to charge BRIA irrigators a rate of return in respect of its Burdekin assets for a variety of legal and policy reasons. In summary, the arguments raised in this regard are as follows:

- the government's past policies in respect of water pricing limit the government's capacity to change water prices in the future to include a rate of return;
- apart from the policy constraint referred to above, there are specific legal constraints that prevent SunWater from charging a rate of return. In particular, legislation prohibiting misleading or deceptive conduct, equitable estoppel and negligent misstatement. In addition, a private sector entity in SunWater's position would be legally prohibited from charging a rate of return; and
- as irrigators were not explicitly advised at auction that a rate of return would be charged, a rate of return should not now be charged.

Past Government Policies

Stakeholder Comment

Some stakeholder responses to the Authority's Draft Report contended that the Queensland Government is bound by its past policies in respect to water pricing, and these previous policies limit the current Government's capacity to change its position with respect to the recovery of a rate of return in irrigation water prices.

In particular, BRIAC have consistently supported a reduction in the rate of return. BRIAC have submitted that the prior application of pricing policy developments to those applying to BRIA prior to COAG, and the lack of clear information on changes in prices to reflect rate of return factors, are arguments against the appropriateness of charging a positive rate of return.

In their final submission, BRIAC indicated that they did not accept the Authority's contention that governments had the capacity to change policies even though it may impact adversely on an individual or a group of individuals. They considered that this amounted to a dismissal of government accountability for past policies. BRIAC have also contended that, as water prices have not changed, full cost recovery from users was not intended to apply to the Burdekin Scheme.

QCA Analysis

Government policy frameworks determine the regulatory environment for both government-owned and commercial businesses. These policy frameworks are subject to ongoing change. Through the democratic process, Australian governments are

elected to adopt, modify or replace existing policies. Within their elected terms, governments make decisions on an ongoing basis that change the business environment.

While policy changes may produce adverse consequences for individuals or communities, there is no explicit constraint on governments to not change a particular policy *solely* because to do so would be detrimental to the welfare of an individual or group of individuals.

As outlined in the Authority's Draft Report (page 97), the Authority's legal advice is that, following a review of past and current water legislation and the representations made by the State during the relevant period, the relevant Ministers are not constrained in specifying water charges for BRIA irrigators and that they have a broad discretion in setting such charges. This broad discretion includes the ability to require that SunWater recover a rate of return in such charges.

While this is the general position based on the available evidence, the Authority accepts that there could be individual cases where this general position does not apply due to the specific circumstances of the case, although the Authority is currently unaware of any such cases. However, the Authority does not consider that the Ministerial Direction envisages an assessment of the circumstances of each individual case to determine if there are any exceptions to the general position.

In response to the BRIAC's final submission, the Authority has not dismissed government accountability relating to past policies. The Authority explicitly takes past contracts and arrangements into account. At the same time, however, the Authority does not resile from its view that, in the absence of any actual or implied contractual arrangements to the contrary, governments may change their policies even though it may impact adversely on a particular individual or group of individuals.

In addition, the Authority accepts that, to date, water prices have not included full cost recovery and that water prices have not increased in real terms. However, the Authority does not consider that this places any constraint on the future actions of the government.

Legal Limitations

Stakeholder Comments

BRIAC submitted to the Authority that there are specific legal constraints - separate from the powers of Government to change policies from time to time - that prevent SunWater from now or ever seeking to recover a rate of return through water prices. They further submitted that it is not appropriate for an entity to charge a rate of return on Scheme assets where such conduct would be precluded as unlawful.

These assertions were based on related submissions that SunWater would be constrained from charging a rate of return under legislation prohibiting misleading or deceptive conduct, equitable estoppel and negligent misstatement.

BRIAC also commented that, as the Government did not state at auction that it intended to charge a rate of return in irrigation water charges, a private sector entity in SunWater's position would be legally prohibited from so charging.

QCA Analysis

On the basis of legal advice received, the Authority has concluded that there does not appear to be any evidence to support general claims for:

- misleading or deceptive conduct [as the material in the auction kits did not create the impression that the Government guaranteed not to increase water charges to include a rate of return at any time in the future];
- equitable estoppel [as the representations in the auction kits did not amount to a 'promise' that water charges would not be increased in the future to reflect a rate of return]; or
- negligent mis-statement [as it is not evident that the information provided by advisers breached their duty of care].

Furthermore, the Authority considers that the same general conclusions would apply in relation to a private sector service provider in the same circumstances.

There could be individual cases where the particular circumstances of the case are such that this general position does not apply, although the Authority is currently not aware of any such cases.

Absence of Prior Advice

Stakeholder Comments

BRIAC has stated that as irrigators were not explicitly advised at auction that a rate of return would be charged, a rate of return should not now be charged. For example:

... charging a positive rate of return is rejected by BRIA irrigators and amounts to moving the goal posts once investors have committed to purchase (p. 13).

And further:

To suggest that Irrigators investing in the BRIA Scheme would have done so knowing that they would be required to pay an unknown rate of return on a yet to be determined value defies logic and fundamental business principles. It is significant that even at the last auction of BRIA farms in 1998 no advice was provided to prospective purchasers that there was a requirement to provide a rate of return as a component of water charges (p. 2 of BRIAC's submission in response to the Authority's Draft Report).

Similarly, CANEGROWERS stated that, as Government did not make their intention to seek a rate of return clear to growers at the time of sale, it is unreasonable to assume that growers factored this into their bids when purchasing land and water (CANEGROWERS in response to the Authority's Draft Report, p. 9).

BRIAC also suggested that, as the Government had changed the policy environment for BRIA irrigators subsequent to their purchase of land, compensation should be payable to BRIA irrigators.

In their final submission, BRIAC argued against the conclusion that BRIA Irrigators should have been aware of a Government requirement for a rate of return because of publicly available information at the time. They argued that all of this ‘information’ was vague at best and in the form of options in draft position papers and did not provide clear evidence of Government’s intentions and, most conspicuously, was released after the majority of auctions were completed.

In this regard, BRIAC noted that the 1996 Water Pricing Policy Paper was only released after 160 blocks had been sold at auction with only 25 blocks still to be released. Further, BRIAC argued that even the COAG Water Reform Policy in relation to rural water did not give Irrigators a clear indication that existing schemes would be required to provide a rate of return as a component of their water charges.

According to BRIAC, the Queensland Government had ample opportunity to inform irrigators investing in the BRIA of their intentions regarding a return on investment. However, they chose not to do so, instead opting to implement a rate of return by stealth.

Finally, BRIAC commented that the Authority appeared to be saying that individuals investing in the Scheme had an obligation to make themselves aware of such things as 1980 reports to Parliament and COAG water reform agendas. They indicated that, in their view, the obligation to inform investors in the Scheme of any likely requirements in relation to rates of return rested with the Queensland Government and its Departments.

Various parties who were involved at the time of the development of the Scheme and subsequent land sales have advised the Authority that, at no time during this period, did the Government indicate that irrigation water charges would include a rate of return. Statements to this effect have been provided to the Authority by Mr Ross Chapman, Mr Lyndsay Hall, Mr Leslie Searle and Mr John Wassmuth (see also section 3.8).

In his statutory declaration attached to the BRIAC submission, Mr James Timothy Smith (former regional engineer for the Department of Natural Resources and Mines in Ayr from 1984 to 1991) submitted that the State Government’s financial target for the Burdekin Scheme, from the late 1970s into the late 1980s, was that the State would seek a direct return of about 30 per cent of its capital cost through land and water allocation sales. Mr Smith stated that this policy was well communicated, not only locally but also to the broader community.

QCA Analysis

Neither the Ministerial Direction nor the *Queensland Competition Authority Act 1977* explicitly require the Authority to have regard to past policies. However, except in the case of a legislative prohibition, the Authority does not consider that a government’s right to change policy precludes the Authority from taking account of a government’s

past actions and statements where this is relevant and in the public interest to do so. Such an approach has been adopted by the Authority in how it recognises capital contributions from land and water sales receipts.

The Authority's consideration of the issue centred on two key issues:

- the intent of government policy; and
- whether irrigators' expectations were reasonable,

The Intent of Government Policy

The intent of a government's policies might be inferred from a number of sources. The primary reference, of course, should be actual government policies, articulated policy statements and authoritative suggestions for the direction of policy development.

The following publicly available information on charging a rate of return in irrigation water charges is relevant to the issues raised by BRIAC:

- in 1980, the Report to Parliament outlined that the continuation of existing prices in real terms would result in a 2.05 per cent real return on capital.³¹ The 1980 report was integral to the Parliamentary approval of the Scheme, and was extensively publicly debated in Parliament. Local Burdekin media reports at the time also referred to the report and its findings;
- in 1987/88, DNRM commenced a five-year plan whereby all schemes would individually provide a surplus over direct local costs of operation and maintenance. For some schemes, increases in excess of inflation were approved by Government under this strategy and grower groups were advised of these intentions³²;
- in 1989, the enactment of the *Water Resources Act 1989* which included wide ranging powers for the Water Resources Commission to levy irrigation water charges, including for the purpose of meeting the cost of principal and interest in connection with the construction or acquisition or the maintenance, repair, administration, control, extension or renewal of works constructed by it or placed under its control (s. 9.39);
- in 1993, the release by the Queensland Government of a water pricing policy options paper *What Price ... Water?*. One option outlined in the paper was for irrigation water charges to include a rate of return on capital of up to five per cent;³³

³¹ Queensland Water Resources Commission. 1980. *Report on Establishment of Burdekin River Project Undertaking*.

³² Letter of advice from DNRM to the Authority, 10 February, 2003. Note also letters to Member for Burdekin regarding removal of rebates, 1 December 1987 and letter from then Minister for Water Resources and Maritime Services to Invicta Mill Suppliers' Committee, 20 October 1988.

³³ Department of Primary Industries. 1993. *Water Price ... Water?* Executive Summary, p. 5 and Water Pricing Policy - Options Paper, p. 35

- for Burdekin land auctions on 3 November 1993 (auction 12), 3 February 1994 (auction 13) and 29 June 1994 (auction 14), the release of material by the Department of Natural Resources which stated under the heading of ‘Water Charges’ that, amongst other things, ‘The State Government is conducting a review of water pricing policy options across Queensland’. Interested parties were invited to seek further information from the relevant contact officer. The contact officer has confirmed that a copy of the policy options paper was provided in response to queries posed in relation to future irrigation water charges;
- in 1994, the Queensland Government agreement to the national strategic water policy framework under the Council of Australian Governments (COAG). Under this framework, the Government committed to:
 - the adoption of pricing regimes based on the principles of consumption-based pricing, full-cost recovery and desirably the removal of cross-subsidies which were not consistent with efficient and effective services, use and provision. Where cross-subsidies continue to exist, they were to be made transparent; and
 - in relation to rural water supply, the achievement of a positive real rate of return on the written down replacement cost of assets, wherever practicable;³⁴
- in 1995, the Queensland Government’s commitment to National Competition Policy through COAG.³⁵ This agreement re-affirmed the original 1994 COAG agreement, which was rolled into the National Competition Policy. The effective implementation of this reform became a precondition of competition payments to the Queensland Government;
- in 1996, the Queensland Government release of a water pricing policy paper which acknowledged that ‘For more recent schemes such as the Burdekin River Project, irrigators have met a component of the capital costs as well as other costs.’³⁶ The 1996 paper proposed the following water pricing policy in relation to existing irrigation schemes:
 - water prices for existing schemes will continue to be adjusted annually in
 - line with any cost changes for providing the services;

³⁴ COAG 1994. *Council of Australian Governments Communique 25 February 1994 (Hobart)*. Available from <http://www.premiers.qld.gov.au/about/igr/communiques/cag25294.htm>

³⁵ COAG 1995. *Council of Australian Governments Communique 11 April 1995 (Canberra)*. Available from <http://www.premiers.qld.gov.au/about/igr/communiques/cag11495.htm>

³⁶ Department of Natural Resources. 1996. *Rural Water Pricing and Management*. Brisbane: Department of Natural Resources.p.6.

- the medium-term objective is to ensure water revenue for each sector (ie urban, agricultural and industrial) covers operating and refurbishment costs of providing supply by 2001; and
- where the medium term objective is already being achieved, this situation will, as a minimum, be maintained.

The Authority also notes that there was a lengthy and public policy debate on these matters, although not necessarily instigated by the Queensland Government. For example:

- in 1992, the release of an Industry Commission (IC) report *Water Resources and Waste Water Disposal*, to which the Burdekin Dam Project Landowners Committee and particular BRIA irrigators made submissions. The IC report made several recommendations in regards to irrigation water prices, including that:
 - a rate of return should be charged in relation to existing schemes, where demand for water is sufficiently strong;
 - the rate of price increases faced by irrigators, and the combination of price increases and cost reductions required to provide a commercial rate of return, should be determined by negotiations between governments and bulk water suppliers; and
 - until such time as charges to irrigators are sufficient to provide commercial rates of return, the shortfalls in revenues should be directly funded by the owner government.³⁷

The IC report was widely reported in local Burdekin media, as well as in State-wide and national media sources. An article on front page of the *Townsville Bulletin* was headlined ‘Water users ‘must pay up’’.³⁸ The same article noted comments by Irrigation Council and Canegrowers State Leader on the proposal, stating that ‘many cane growers would be crippled if the State Government adopted the price increases recommended by the Commission.’

The Queensland Government’s immediate response to the IC report was outlined by a spokesman for the (then) Primary Industries Minister: ‘These recommendations are just that - they are recommendations...The Queensland Government is taking action on a water pricing review. When the review is finished early next year then we will look at the IC report and probably blend the two to come up with a new policy’;³⁹

³⁷ Industry Commission. 1992. *Water Resources and Waste Water Disposal*. Report no. 26. Canberra: Australian Government Publishing Service.

³⁸ Cahill, A. 1992. Water users ‘must pay up’. *Townsville Bulletin*. Saturday, September 26:1.

³⁹ Cahill, A. IC report ‘not the final work on Burdekin’. *Townsville Bulletin*. September 26:3.

⁴⁰ Report by the Independent Committee of Inquiry (Hilmer Report). 1993. *National Competition Policy*. Canberra: Australian Government Publishing Service. p. 285.

⁴¹ DNRM ‘Talking Water Reform – rural water pricing’. November 2002

- in 1993, the release of the Hilmer Report National Competition Policy, which envisaged the implementation of a monopoly prices oversight regime which would include provision for a normal commercial profit.⁴⁰ Whilst irrigation water charges were not specifically identified in this context, the Authority notes that Canegrowers - Burdekin District provided a submission to this review.

In regard to water charges in general, a recent information paper released by DNRM noted that, 'Prices charged for irrigation water rarely covered costs, and reflected a policy of government subsidies to encourage regional development through irrigated agriculture.'⁴¹ DNRM have advised the Authority that this statement reflected the situation that, for many irrigation projects throughout Queensland, the full costs associated with capital invested by Government as well as on-going costs of operation and maintenance were not recovered from revenue from water charges – and, that projects were established to provide additional water supplies with a view to ensuring continued economic growth.

Were Irrigators' Expectations Reasonable?

In principle, parties purchasing water rights should not be required to pay higher prices where it was originally clearly represented to them that prices would not increase. From an efficiency point of view, future responses of growers to new government policies might have unintended and undesirable effects if the parties no longer have confidence that the undertakings will be respected. For these reasons the expectations of irrigators are considered to be relevant to the matter to hand.

While it is possible that irrigators' *actual* expectations may differ markedly from the Authority's view of *reasonable* expectations, the Authority considers that it is only appropriate to recognise those expectations that are considered to be reasonable. To do otherwise would remove the incentive for parties to seek to negotiate clear and unambiguous arrangements into the future.

The Authority accepts that rates of return on irrigation charges were not explicitly discussed with growers during the auction period.

However, the Authority considers that growers were or should have been aware, that irrigation charges could increase in the future to exceed the direct local costs of production and maintenance. In this regard, the Authority notes that, over the period of development of the Scheme and subsequent BRIA land sales:

- there was significant public debate on this matter; and
- irrigators had access to various representative groups with specific responsibilities for information gathering and representative responsibilities,

including for issues of water pricing. Indeed, irrigators made cogent submissions to various inquiries and assessments of water pricing over the

period under assessment, suggesting a relatively sophisticated level of understanding of the issues and ongoing policy debates.

Accordingly, the Authority considers that it was not reasonable for irrigators to have assumed that water prices, and the basis for determining water prices, would remain unchanged for ever.

Irrigators have also claimed they would have bid lower amounts at land auctions, were it not for the expectations they had formed that water prices would not increase in the future to provide for a rate of return to SunWater. In this regard, the Authority notes that, even if irrigators were to have bid less at auction for BRIA land on the basis that they foresaw that water prices may increase in the future, there would be a corresponding reduction in the capital contributions implied in land/water sales revenues. Lower auction prices would therefore cause a higher “unaccounted for capital” value for the purposes of assessing whether or not SunWater’s charges include an excess return on capital.

In response to the BRIAC’s final submission, the 1980 report to Parliament and correspondence in December 1987 advised of the government policy to recoup more than lower bound costs. This occurred before any land was sold to growers (the first auctions commenced in March 1988). The first reference to a specific rate of return (5 per cent) was raised in 1993 in the options paper *What Price....Water?* About 90 of the 216 properties had been sold by that stage.

So far as the various statutory declarations are concerned, the Authority accepts that the issue of a return on capital was not discussed during the period leading up to the commencement of the Scheme. However, for the reasons outlined earlier, the government is not precluded from subsequently changing its policies.

In respect of the particular comments made by the statutory declarants, the Authority accepts that the Commonwealth provided the funds to the State as a non-repayable grant and that it did not expect the State to repay these funds to it. However, this does not preclude the State Government from seeking a rate of return on these funds.

Indeed, in the absence of any specific requirements to the contrary, the nature of the funding was such that the only restriction on its use was that it be expended on the construction of the Burdekin Dam.

Despite the assistance of relevant agencies, the Authority has been unable to identify any relevant documentation to support Mr Smith’s statements.

In respect of claims that the Commonwealth expected to receive its returns through indirect benefits, the Authority notes that it may be an effective and appropriate course of action to promote activities which benefit the public interest. However, as the funds were provided to the State, it is open to the State to apply them on terms considered most appropriate by the State.

Furthermore, as noted in the Authority’s Draft Report, flow on or ‘multiplier’ effects do not necessarily equate to increases in economic welfare as multipliers do not address the question of whether benefits of increased activity in one area outweigh the costs, or evaluate the economic merits of other investment options.

The 1980 Report to Parliament stated that such benefits did not represent a net benefit to the State.

Conclusions

The Authority accepts that that the issue of a return on capital was not discussed during the period leading up to the commencement of the Scheme. In addition, the Queensland Government has not always clearly articulated its future pricing policy, particularly in respect to matters such as the rate of return on capital. However:

- in the absence of any actual or implied contractual arrangements, the government has the power to alter existing pricing arrangements even though they may adversely impact on a particular individual or group of individuals. Further, the Authority's legal advice is that there are no actual or implied contractual arrangements in respect of BRIA irrigators;
- on the basis of legal advice received, the Authority has concluded that there does not appear to be any evidence to support general claims for:
 - misleading or deceptive conduct [as the material in the auction kits did not create the impression that the Government guaranteed not to increase water charges to include a rate of return at any time in the future];
 - equitable estoppel [as the representations in the auction kits did not amount to a 'promise' that water charges would not be increased in the future to reflect a rate of return]; or
 - negligent mis-statement [as it is not evident that the information provided by advisers breached their duty of care].

Furthermore, the Authority considers that the same general conclusions would apply in relation to a private sector service provider in the same circumstances; and

irrigators were or should have been aware, that irrigation charges could increase in the future. In this regard, while there was no clear statement from government that a rate of return would be charged, it was evident that governments were changing their direction in respect to pricing towards more commercial pricing practices. Initially, such statements related to the Queensland Government seeking in excess of local costs of operation and maintenance, and more recently took the form of national agreements under COAG to include a rate of return, where practicable. The earlier advices to grower representatives were forwarded in December 1987 and again in October 1988. The first auction sales of land in the BRIA were undertaken in March 1988.

A. MINISTERIAL DIRECTION

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B. STATISTICS**Table B.1: Total Expenditure for Irrigation Works and the Burdekin Falls Dam (October 2000 \$m)**

	<i>Irrigation Works</i>	<i>Burdekin Falls Dam</i>		<i>Total Expenditure</i>
		<i>Queensland Government Expenditure</i>	<i>Commonwealth Government Expenditure</i>	
1979-80		3.2	0.0	3.2
1980-81		7.8	0.0	7.8
1981-82		7.9	0.0	7.9
1982-83	13.9	7.9	7.7	29.5
1983-84	10.8	9.0	24.8	44.6
1984-85	12.3	10.8	36.4	59.5
1985-86	33.5	9.6	44.1	87.3
1986-87	31.4	0.9	47.5	79.7
1987-88	29.2	0.4	22.3	51.8
1988-89	17.1	0.4	4.7	22.1
1989-90	21.0		5.8	26.8
1990-91	21.6		3.8	25.4
1991-92	23.3		0.2	23.5
1992-93	22.9		0.0	22.9
1993-94	14.6			14.6
1994-95	16.9			16.9
1995-96	17.5			17.5
1996-97	17.7			17.7
1997-98	9.2			9.2
1998-99	10.8			10.8
1999-00	2.7			2.7
2000-01	5.5			5.5
Total	331.8	57.8	197.4	587.0

Note: Expenditure data sourced from Sun Water Accounts and DNRM submission to the Public Works Committee. Indexed using yearly average of CPI and BMI (Building Materials Index).

Table B.2: Comparison of estimated and actual expenditure for Burdekin Scheme - Burdekin Falls Dam and Irrigation Area Works (\$m)

	<i>Estimated expenditure (1980 report)</i>		<i>Actual expenditure</i>
	<i>December 1977 \$m</i>	<i>October 2000 \$m</i>	<i>October 2000 \$m</i>
Gross expenditure^a			
Burdekin Falls Dam	75.0	257.1	255.2
Irrigation Area Works	94.4	323.7	331.8
Total	164.4	580.8	587.0
Expenditure net of land and water entitlement sales			
Burdekin Falls Dam	75.0	257.1	255.2
Irrigation Area Works	80.2	275.0	227.5
Total	155.2	532.1	482.7

^a Irrigation Area Works gross expenditure = net expenditure plus revenues from land sales.

Source: Estimated expenditure sourced from 1980 report to Parliament (pages 3,10 and 15). Actual expenditure from SunWater and the Authority's estimates.

Table B.3: Total (Non-Depreciated) Capital Contributions^a (October 2000 \$ thousand)

	<i>Channel</i>	<i>River</i>	<i>Other</i>	<i>Total</i>
Retention Farms (Headworks Contributions)	8,331	1,103	-	9,434
Auction Sales of Land	29,342	-	-	29,342
Water Sales	20,398	6,523	3,787	30,708
Meters and Barratta Main Channel Upgrade	2,113	10	30	2,153
Total	60,184	7,636	3,817	71,637

^a These figures represent contributions relevant to all parties and have not been depreciated to reflect the aging of assets.

^b Included for information purposes only.

Table B4: Basis of Cost Allocation

<i>Users</i>	<i>ML</i>	<i>Losses</i>	<i>ML (with markup for priority^a)</i>	<i>Losses (with markup for priority^a)</i>	<i>Total</i>	<i>Per cent</i>	<i>Per cent of total</i>
Channels							
BRIA	281,721	138,459	281,721	144,158	425,879	68.8%	44.6%
NQWater	10,000	4,838	18,000	9,094	27,094	4.4%	2.8%
NQWater	110,000	53,214	110,000	55,576	165,576	26.8%	17.3%
SunWater	0	0	0	0	0	0.0%	0.0%
Amenities	99	53	178	98	276	0.0%	0.0%
Total	401,820	196,564	409,899	208,926	618,826	100.0%	64.8%
River							
BRIA	53,120	0	53,120	0	53,120	17.5%	5.6%
Boards and Other	250,500	0	250,500	0	250,500	82.5%	26.2%
Total	303,620	0	303,620	0	303,620	100.0%	31.8%
Haughton/Giru/Other							
BRIA	20,549	9,941	20,549	10,382	30,931	96.0%	3.2%
Citiwater	480	232	864	437	1,301	4.0%	0.1%
Total	21,029	10,173	21,413	10,819	32,232	100.0%	3.4%
TOTAL	726,469	206,737	734,932	219,745	954,677		100.0%

^a High priority water allocations (as specified in the IROL for the Burdekin Scheme) are marked up by 1.8 to reflect the higher level of supply security attributable to this allocation. This factor was determined using the available hydrological modelling of the Burdekin Scheme by the WRU. High priority water allocations include those for urban uses (such as NQ Water's 10 000 ML allocation and water allocated to amenities and Citiwater) and initial losses (allocated to all users).

Table B.5: Depreciated Capital Contributions^a (October 2000 \$ thousand)

	<i>Channel</i>	<i>River</i>	<i>Other</i>	<i>Total</i>
Retention Farms (Headworks Contributions)	7,171	1,005	-	8,176
Auction Sales of Land	25,254	-	-	25,254
Water Sales	17,556	5,945	3,239	26,740
Meters and Barratta Main Channel Upgrade	1,818	10	26	1,854
Total	51,799	6,960	3,265	62,024

^a Contributions have been depreciated to reflect the aging of assets.

^b Included for information purposes only.

Table B.6: Depreciated Capital Contributions relevant to BRIA^a (October 2000 \$ thousand)

	<i>Channel</i>	<i>River</i>	<i>Other</i>	<i>Total</i>
Retention Farms (Headworks Contributions)	7,171	1,005	-	8,176
Auction Sales of Land	25,254	-	-	25,254
Water Sales	17,556	560	3,239	21,355
Meters and Barratta Main Channel Upgrade	1,818	10	26	1,854
Total	51,799	1,575	3,265	56,639

^a BRIA's share of depreciated capital contributions. These are based on table B.5 and reflect the capital contributions made by, or attributable to, BRIA users. In particular, some of the water sales noted in table B.5 were to non-BRIA river users. In addition, the Commonwealth grant applies to all users of the Dam and has been attributed to users based on the allocations in table B.4.

^b Included for information purposes only.

APPENDIX C: ALTERNATIVE MEASURES OF WACC

Classic al tax system

As noted by Officer (1994), under a classical tax system, the appropriate definition of a company's pre-tax WACC can be expressed as follows:

Cash Flow	WACC
X_0	$r_o = \frac{r_e}{(1-T)} \frac{E}{(E+D)} + r_d \frac{D}{(E+D)}$ <p>where</p> <p>r_e is the return on equity</p> <p>r_d is the return on debt (the cost of debt)</p> <p>E is the market value of equity</p> <p>D is the market value of debt</p> <p>T is the corporate tax rate</p>

The amount of tax collected from the company under a classical tax system by the government can be found as $X_g = T(X_0 - X_d)$. Hence,

$$X_0 = T(X_0 - X_d) + X_e + X_d$$

which converts to:

$$X_0(1-T) = X_e + X_d(1-T)$$

The after-tax WACC under a classical tax system can be expressed as either:

Cash Flow	WACC
$X_0(1-T)$	$r_1^c = r_e \frac{E}{(E+D)} + r_d (1-T) \frac{D}{(E+D)}$
$X_0 - (X_0 - X_d)T_c$	$r_2^c = r_e \frac{E}{(E+D)} + r_d \frac{D}{(E+D)}$

Dividend imputation system

Under the dividend imputation tax system, shareholders recover, via imputation tax credits, some proportion of the corporate taxes that have already been paid. This has two effects in relation to the calculation of WACC. First, it decreases the effective corporate tax rate and thereby increases the cash flows to shareholders. Second, the decrease in the effective tax rate will reduce the effective tax shield provided by debt relative to equity. Therefore, under dividend imputation, it is necessary to allow for increased cash flow to shareholders and the increased after-tax cost of debt.

In the presence of dividend imputation, the effective tax rate changes from T_c to $T_e = T_c(1-\gamma)$ where:

T_c is the statutory tax rate (equivalent to the classical tax rate); and

γ is the value of imputation credits, representing the proportion of tax collected from the company which gives rise to the tax credit associated with a franked dividend.

In the presence of dividend imputation, the appropriate definition of a company's pre-tax WACC can be expressed as:

Cash Flow	WACC
X_0	$r_o = \frac{r_e}{(1-T_c(1-g))} \frac{E}{(E+D)} + r_d \frac{D}{(E+D)}$

Under dividend imputation, the effective level of company tax is defined as:

$$\begin{aligned} X_g &= T(X_0 - X_d) - gT(X_0 - X_d) \\ &= T(X_0 - X_d)(1-g) \end{aligned}$$

Hence:

$$X_0 = (X_0 - X_d)T_c(1-g) + X_e + X_d$$

which converts to:

$$X_0(1-T_c(1-g)) = X_e + X_d(1-T_c(1-g))$$

In the presence of dividend imputation, the appropriate definition of a company's post-tax WACC can be expressed as:

Cash Flow	WACC
$X_0(1-T_c)$	$WACC\ 1 = r_e \frac{(1-T_c)E}{(1-T_c(1-g))(E+D)} + r_d(1-T_c) \frac{D}{(E+D)}$
$X_0(1-T_c(1-g))$	$WACC\ 2 = r_e \frac{E}{(E+D)} + r_d(1-T_c(1-g)) \frac{D}{(E+D)}$
$X_0 - (X_0 - X_d)T_c(1-g)$	$WACC\ 3 = r_e \frac{E}{(E+D)} + r_d \frac{D}{(E+D)}$
$X_0(1-T_c) + gT_c(X_0 - X_d)$	$WACC\ 4 = r_e \frac{E}{(E+D)} + r_d(1-T_c) \frac{D}{(E+D)}$

Under WACC 1, cash flows are presented as the standard after-tax cash flows under a classical system. The WACC must account for the imputation effects.

Under WACC 2, all operating income is taxed at the company tax rate, adjusted for imputation. The WACC must correct for the overstated tax shield.

Under WACC 3, the effective after-corporate-tax income attributable to equity and debt holders is fully and correctly recognised in the cash flows. All tax adjustments are kept out of the WACC and are recognised directly in the cash flows.

Under WACC 4, imputation is fully and correctly recognised as a modified cash flow but tax is overstated as the debt shield is ignored. The WACC must correct for the overstated tax effect.

APPENDIX D: THE RELATIONSHIP BETWEEN EQUITY, DEBT AND ASSET BETAS

The WACC relationship expresses the entity's cost of capital as the weighted average of the required return on its equity and debt. Because of the equivalence between the assets of the entity to a portfolio of the entity's equity and debt with respective weights of $\frac{E}{E+D}$ for equity and $\frac{D}{E+D}$ for debt, the return on assets can be expressed as follows:

$$R_a = R_e \left(\frac{E}{E+D} \right) + R_d \left(\frac{D}{E+D} \right)$$

Substituting CAPM, expressed as $R_i = R_f + \beta_i (R_m - R_f)$, for each of the returns (R_a , R_e and R_d) gives:

$$R_f + \beta_a (R_m - R_f) = \left(R_f + \beta_e (R_m - R_f) \right) \left(\frac{E}{D+E} \right) + \left(R_f + \beta_d (R_m - R_f) \right) \left(\frac{D}{D+E} \right)$$

which is equivalent to:

$$\beta_a = \beta_e \left(\frac{E}{D+E} \right) + \beta_d \left(\frac{D}{D+E} \right)$$

where:

R_i is the expected return on asset i ;

R_a is the return on assets;

R_e is the return on equity;

R_d is the return on debt (the cost of debt);

R_f is the risk free rate;

R_m is the expected return on the market portfolio of risky assets;

β_i is the beta, or non-diversifiable risk, of asset i ;

β_a is the asset beta;

β_e is the equity beta; and

β_d is the debt beta.

An asset beta represents the risk arising from the sensitivity, or covariance, of the operating cash flows generated by the assets of an entity compared with the market in general. Asset betas are not directly observable and therefore must be derived from equity betas. The difference between an asset beta and an equity beta reflects the extent to which debt is used to finance the entity's assets.

It is obvious from the above that the beta of an entity's assets is equal to the betas of the entity's equity and debt weighted by the respective weights for equity and debt. Whilst equity and debt betas can be calculated via CAPM based methods, the asset beta can only be inferred via the above relationship.

Issues in the estimation of the equity beta

An entity's equity beta (β_e) reflects both the market risk associated with its assets and the financial risk carried by shareholders due to the entity's use of debt financing. CAPM assumes that a linear relationship exists between an entity's gearing and the premium associated with that gearing. Two factors have been identified as key determinants of an entity's equity beta:

financial leverage – the ratio of debt to equity, where a higher level of debt implies a higher beta; and

sensitivity to cash flows – relative to overall economic activity, where more cyclical cash flows are associated with higher betas.

Typically, equity betas are estimated using historical data through the application of the market model which is derived from CAPM (expanded as follows):

$$R_i = R_f + b_i R_m + b_i R_f$$

$$R_i = R_f (1 - b_i) + b_i R_m$$

$$R_i = a_i + b_i R_m$$

where

a_i is equal to $R_f (1 - b_i)$

b_i is the equity beta

The estimation of equity betas is not without controversy. There are numerous issues relevant to its estimation that the Authority considered, including the following:

- the choice of return measure – for example whether returns should be discrete or continuously compounded, whether raw or excess returns should be used and whether nominal or real returns should be used. Typically the risk free rate and MRP are both expressed as discretely compounded returns;
- the choice of proxy for the market portfolio. By definition, the measurement of a beta is relative to a MRP, which in turn relates to a single specific market. Accordingly, beta estimates for a company differ depending on which stock market index is used – systematic risk is largely country specific and meaningful beta estimates can only be derived using a national index from a company's own country of operation. Therefore caution is required in comparing betas of companies operating in similar industries but in different countries as betas reflect the risk of a company relative to the market in which it operates. Differences in market composition of national share markets do not facilitate direct comparison of betas. As outlined in Table C1, the Australian stock market has a greater component of resource stocks, which account for 16.5% of total Australian market capitalisation. This suggests that the ASX may have a different risk profile compared with the US stock market (where resources stock account for 6.9% of total US stock market capitalisation, and 7.4% of total UK stock market capitalisation);

Table C1: Composition of market indices

<i>Index (as at 30 Nov 1998)</i>	<i>Resource Sector</i>	<i>Industrial Sector</i>	<i>Market Capitalisation</i>
Australian All Ordinaries Accumulation Index	16.5%	83.5%	A\$417.0 billion
US Standard & Poors 500	6.9%	93.1%	US\$10.6 trillion
UK FTSE 100	7.4%	92.6%	£1.04 trillion

- the sampling interval for the data and the length of the estimation period. Estimates using short interval data (measured at daily or weekly intervals) are systematically biased, such that highly traded securities are overstated whilst those of infrequently traded securities are understated. Alternatively, use of long intervals (measured quarterly or annually), lowers the number of data points used in the estimation process and diminishes the accuracy of beta measures. Empirical evidence discussed in Brailsford, Faff and Oliver (1997) shows that beta estimates using monthly data estimated over four to five year intervals provide the most reasonable trade-off between the number of observations and the stability of beta estimates; and
- beta is typically estimated using the market model, using an ordinary least squares approach. As with all econometric modelling applications, there are a number of assumptions which need to be satisfied in order to produce a robust estimate.

The Authority regards the stability of beta as an important issue in identifying the appropriate equity beta for utility businesses. Empirical evidence from Australian markets strongly supports the mean reversion of beta. Raw beta values, derived from historical data, can be adjusted based on the assumption that beta factors change over time, especially in industries where there is considerable structural reform underway.⁴² The true beta has a tendency over time to move toward the market average of one and this adjustment may be represented as:

$$\text{Adjusted (future) beta} = \text{Raw Beta} * (0.67) + 0.33$$

This is the approach adopted by Bloomberg (2000), which appears to be generally accepted by practitioners.

The Authority is still reviewing the use of an adjustment factor for beta. However, for the purpose of the draft recommendation the Authority has applied the Bloomberg adjustment factor as follows when estimating betas:

$$\text{Adjusted beta} = 0.33 + 0.67b_i$$

Issues in the estimation of debt betas

The debt beta (β_d) reflects the financial risk borne by shareholders due to the entity's use of debt financing. CAPM can be used to identify the debt beta.

⁴² International studies supporting the use of adjusted betas include Sharpe, Alexander and Bailey (1995) and Blume (1975).

$$R_d = R_f + b_d [R_m - R_f]$$

Transformed

$$b_d = \frac{(R_d - R_f)}{[R_m - R_f]}$$

where

R_f = the risk free rate

R_m = the expected return on the market portfolio of risky assets

R_d = the expected return on debt

$b_d = \frac{Cov(R_d, R_m)}{Var(R_m)}$ = the debt beta

$[R_m - R_f]$ = the equity risk premium

The debt beta calculation is very sensitive to the size of the MRP. If the latter increases it will reduce the size of the debt beta.

Some regulators apply the CAPM based model with a 50 basis point adjustment to reflect the administrative costs of establishing and maintaining a debt financing facility. The resulting adjusted debt beta will be lower than the unadjusted debt beta. However, equity capital also incurs administrative and other costs and fees. To adjust the cost of only one form of capital (debt or equity) would distort the relative costs. Since there are administrative costs associated with both forms of capital, the Authority does not support an adjustment to the cost of debt or equity for fees which are operating expenses to the business.

Issues in the estimation of asset betas

CAPM assumes a linear relationship between the equity beta and the gearing of an entity. Hence, it is possible to calculate asset betas from equity betas. The asset beta refers to the beta applicable to the assets of an entity that has no debt. The gearing of the entity needs to be taken into account in estimating asset betas because default risk is incorporated in equity values and this needs to be removed to arrive at the entity's risk profile independent of its financial structure. The adjustment of estimated equity betas to remove the financial risk associated with a security, leaving the risk of the asset encapsulated in the asset beta (β_a), is known as de-levering of the equity beta.

There are several approaches to de-levering and re-levering betas and there is no consensus as to which method is the most appropriate. The Authority identified the methods used extensively by academics and regulators to de-lever and re-lever equity betas, and broadly categorised them as follows:

- the standard or textbook approaches including both the Brealey Myers (1999) and Conine (1980) approaches;
- the Davis (1998) approach; and,
- the Appleyard & Strong (1998) / Monkhouse (1997) approach.

The Authority undertook an analysis of the alternative approaches and found that the resulting impact on WACC of using the alternative approaches was not significant. This view was also supported by the ORG (2000) which noted:

‘‘The impact on the estimated after-tax WACC of using a different debt beta and levering approaches [is] not significant, however, *provided* that the same approach is used when deriving a proxy asset beta from the comparable entities, as is used when deriving a proxy asset beta back into an equity beta.’

Based on its analysis of the alternative approaches and consistent with its use of the post-tax nominal WACC, the Authority has used the Brealey/Myers approach in all de-levering/re-levering applications.

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