



Final Report

SunWater

Irrigation Price Review: 2012-17

Volume 2

Bundaberg Water Supply Scheme

April 2012

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GLOSSARY

Refer to Volume 1 for a comprehensive list of acronyms, terms and definitions.

EXECUTIVE SUMMARY

Ministerial Direction

The Authority has been directed by the Minister for Finance and The Arts and the Treasurer for Queensland to recommend irrigation prices to apply to particular SunWater water supply schemes (WSSs) from 1 July 2012 to 30 June 2017 (the 2012-17 regulatory period). A copy of the Ministerial Direction forms **Appendix A** to Volume 1.

Summary of Price Recommendations

The Authority's recommended irrigation prices to apply to the Bundaberg bulk WSS for the 2012-17 regulatory period are outlined in Table 1 together with actual prices since 1 July 2006.

Table 1: Prices for the Bundaberg WSS (\$/ML)

	<i>Actual Prices</i>						<i>Recommended Prices</i>				
	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Fixed (Part A)	6.20	6.36	6.68	6.88	7.08	7.36	10.99	11.26	11.55	11.83	12.13
Volumetric (Part B)	9.66	9.94	10.42	10.75	11.08	11.47	1.10	1.13	1.16	1.19	1.22

Source: Actual Prices (SunWater, 2011a) and Recommended Prices (QCA, 2012).

Final Report

Volume 1 of this Final Report addresses key issues relevant to the regulatory and pricing frameworks, renewals and operating expenditure and cost allocation, which apply to all schemes.

Volume 2, which comprises scheme specific reports, should be read in conjunction with Volume 1. Also relevant is the Final Report on the Bundaberg Distribution System.

Consultation

The Authority has consulted extensively with SunWater and other stakeholders throughout this review. Consultation has included: inviting submissions from, and meeting with, interested parties; the commissioning of independent reports on key issues; and, publication of Issues Papers.

All submissions received on the Draft Report have been taken into account by the Authority in preparing its Final Report.

1. BUNDABERG WATER SUPPLY SCHEME

1.1 Scheme Description

The Bundaberg water supply scheme (WSS) is located near the towns Bundaberg, Childers and Gin Gin. An overview of the key characteristics of this WSS is provided in Table 1.1.

Table 1.1: Key Scheme Information for the Bundaberg WSS

<i>Bundaberg WSS</i>	
Business Centre	Bundaberg
Irrigation Uses of Water	Sugarcane, tomatoes, rockmelons, watermelons, capsicum, zucchini, beans, macadamia nuts and avocado.
Urban water supplies	Supplies water to Bundaberg as well as communities in the Burnett, Kolan and Isis shires.
Industrial Water Supplies	Sugar mills

Source: Synergies Economic Consulting (2010).

The Bundaberg WSS has a total of 1,109 bulk customers. Medium and high priority water access entitlements (WAEs) are shown in Table 1.2.

Table 1.2: Water Access Entitlements

<i>Customer Group</i>	<i>Irrigation WAE (ML)</i>	<i>Total WAE (ML)</i>
Medium Priority	185,689	211,957
High Priority	0	24,372
Total	185,689	236,329

Source: SunWater (2011am).

1.2 Bulk Water Infrastructure

Bulk water services involve the management of storages and WAEs in accordance with regulatory requirements, and the delivery of water to customers in accordance with their WAE.

Stakeholder Submissions

SunWater

SunWater submitted that the Bundaberg WSS consists of two sub-schemes: the Kolan River sub-scheme and the Lower Burnett River sub-scheme. The full supply storage capacity and age of key infrastructure is detailed in Table 1.3.

Table 1.3: Bulk Water Infrastructure in the Bundaberg WSS

<i>Storage Infrastructure</i>	<i>Capacity (ML)</i>	<i>Age (years)</i>
Kolan River sub-scheme:		
Fred Haigh Dam	562,000	35
Bucca Weir	11,600	23
Kolan Barrage	4,020	37
Lower Burnett River sub-scheme:		
Ned Churchward Weir	29,500	12
Ben Anderson Barrage	30,300	34

Source: SunWater (2011) and QCA (2011).

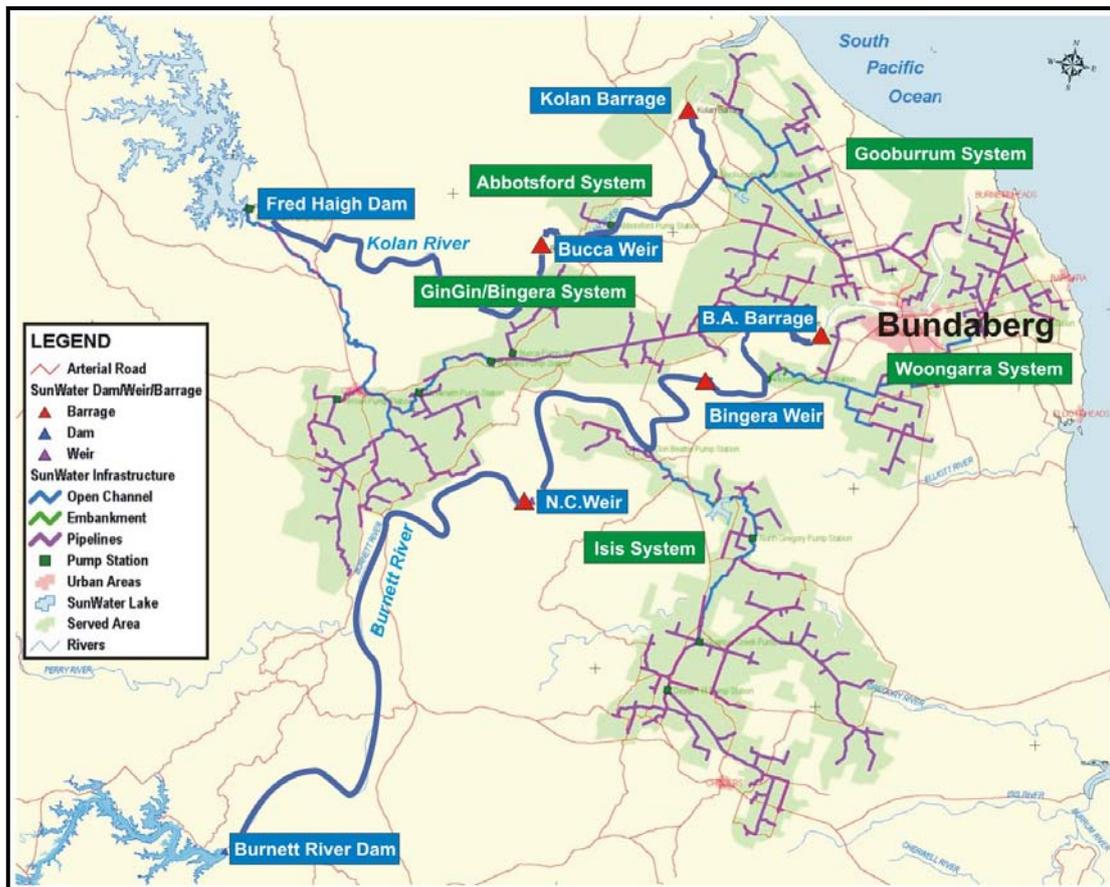
The Kolan River sub-scheme includes:

- (a) Fred Haigh Dam, which is the principal bulk water storage in the Bundaberg WSS and lies approximately 75 kilometres from the mouth of the Kolan River;
- (b) Bucca Weir, which is a roller-compacted concrete weir that is used to recharge the Kolan Barrage and to supply customers between the weir and the pond of the Kolan Barrage; and
- (c) Kolan Barrage, which has a vertical-slot fishway, but no other outlet.

The Lower Burnett River sub-scheme includes:

- (a) Ned Churchward Weir, which has a fully automated fishlock and includes a small anabranch weir built to prevent the river from deepening at the anabranch;
- (b) Ben Anderson Barrage which has a four-gated vertical slot fishway. Each gate is positioned at a different level so that the fishway will meet Resource Operations Plan (ROP) requirements; and
- (c) Bingera Weir.

The location of the Bundaberg WSS and key infrastructure is shown in Figure 1.1.

Figure 1.1: Bundaberg WSS Locality Map

Source: SunWater (2011).

Other Stakeholders

In considering scheme assets, stakeholders queried whether:

- (a) Bucca Weir is a bulk or distribution asset (Bundaberg Regional Irrigators Group (BRIG, 2011c) and irrigators during the second round of consultations (April 2011);
- (b) Bingera Weir is a SunWater asset (BRIG 2011c); and
- (c) river customers' meters are a bulk or distribution asset (BRIG, 2010). [It is understood that this query derives from distribution customers who propose they should not pay for river meters in a bundled bulk charge, as only river users benefit from these assets.]

Authority's Analysis

In relation to Bucca Weir, the Resource Operations Plan (ROP) for Bundaberg WSS and the letter from Minister Robertson, dated 28 September 2010, confirms that Bucca Weir is a bulk asset.

Further, SunWater has confirmed that Bingera Weir was mistakenly included in the Bundaberg Network Service Plan (NSP) and that Bingera Weir is not a SunWater asset (email 3 June 2011).

The issue of whether to recover the costs of river meters in a separate component of the bulk charge is addressed in Chapter 5.

1.3 Network Service Plans

The Bundaberg WSS NSP presents SunWater's:

- (a) existing service standards;
- (b) forecast operating and renewals costs and including the proposed renewals annuity; and
- (c) risks relevant to the NSP and possible reset triggers.

SunWater has also prepared additional papers on key aspects of the NSPs and this price review, which are available on the Authority's website.

1.4 Consultation

The Authority has liaised extensively with SunWater and other stakeholders throughout this review. To facilitate the review, the Authority has:

- (a) invited submissions from interested parties;
- (b) met with stakeholders to identify and discuss relevant issues (two rounds of consultation prior to the Draft Report);
- (c) published notes on Issues Arising from each round of consultation;
- (d) commissioned independent consultants to prepare Issues Papers and review aspects of SunWater's submissions;
- (e) published all issues papers and submissions on its website;
- (f) considered all submissions and reports in preparing Draft Reports for comment; and
- (g) in particular, after releasing the Draft Report:
 - (i) considered issues arising from a third round of consultation in November and December 2011 and submissions on the Draft Report;
 - (ii) obtained and reviewed additional information, particularly relating to past and future renewals expenditures, and non-direct and direct costs; and
 - (iii) subjected SunWater's financial, renewals annuity and electricity models and the Authority's pricing module to independent external review.

In preparing its Draft Report, the Authority has also received a number of submissions from stakeholders on matters such as capacity to pay, rate of return on existing assets, contributed assets, dam safety upgrades, nodal pricing and national metering standards. Submissions also referred to the merits of recovering recreation management costs from SunWater's customers.

Following the amendment to the original Ministerial Direction of 19 March 2010 and further advice from the Minister of 23 September 2010 and 9 June 2011, these issues are outside the scope of the current investigation and have therefore not been addressed.

The Ministerial Direction forms **Appendix A** to Volume 1.

2. REGULATORY FRAMEWORK

2.1 Introduction

Under the Ministerial Direction, the Authority must recommend the appropriate regulatory arrangements, including price review triggers and other mechanisms, to manage the risks associated with identified allowable costs.

During the negotiations that preceded the 2006-11 price path, the Bundaberg Tier 2 group indicated that they were in favour of retaining the existing price cap regulatory arrangement. In the 2011-12 interim price period, the price cap arrangement was continued.

2.2 Draft Report

Stakeholder Submissions

SunWater

SunWater identified a range of generic risks considered relevant to allowable costs across all schemes (see Volume 1). SunWater also considered that it should not bear the risk of water availability (volume risk). The following are scheme specific risks identified by SunWater in the NSP associated with the Bundaberg WSS:

- (a) the introduction of schemes relating to the reduction of greenhouse gases that may have implications for electricity prices;
- (b) damage to SunWater's assets, to the extent that such damage is not recoverable under insurances;
- (c) metering costs related to changes in regulatory standards;
- (d) unplanned frequency of installing and operating pumps to access low storage levels;
- (e) levies or charges made in relation to the regulation of irrigation prices by the Authority;
- (f) the availability of chemicals to control submerged weeds and algae in channels; and
- (g) outbreak of noxious weeds.

Other Stakeholders

Allocation of Risk

Bundaberg Fruit and Vegetable Growers (BFVG, 2010a) acknowledged that it is difficult to forecast future demand [volume risk] due to varying weather and rainfall events.

ISIS Sugar Partnership (2010) submitted that volume risk should be considered across all schemes as well as within each scheme. ISIS Sugar Partnership indicated that SunWater's volume risk should be measured over the past 20 years, not the past five years.

During the first round of consultations (May 2010), irrigators stated that SunWater has a small revenue risk. They submitted that irrigators bear most of the risk as they are obliged to pay Part A charges regardless of water use.

Support for a Price Cap

Stakeholders supported the continuation of a price cap for the Bundaberg WSS. In particular:

- (a) BFVG (2010b) submitted that the price cap arrangement with a fixed Part A of 70% and Part B of 30% has worked well in Bundaberg WSS. They submitted that a price cap is preferred to ensure price stability throughout the regulatory period, whereas under a revenue cap arrangement, prices could be adjusted frequently leading to greater price volatility which may be disruptive and distort the planning of cropping cycles for irrigators;
- (b) BRIG (2010e) noted that it preferred a price cap and that if fixed costs are matched to Part A and variable costs matched to Part B, much of the debate relating to the different levels of water use (availability and sales) is removed. BRIG (2010a) also noted that there would not be sufficient interest within the Bundaberg Scheme to adopt a revenue cap; and
- (c) CANEGROWERS Isis (2011) noted that while they supported the price cap option, they had concerns with the projected water use figure nominated by SunWater in the NSP.

Other

ISIS Sugar Partnership (2010) stated that the form of regulation should provide sufficient incentive to SunWater to pursue efficiencies in its variable costs.

BRIG (2010) submitted that the pricing system should not prevent later adoption of capacity share or continuous accounting.

Authority's Analysis

General Risks

The Authority has, in Volume 1, analysed the nature of the risks confronting SunWater and recommended that an adjusted price cap apply to all schemes. The proposed allocation of risks and means for addressing those risks is outlined in Table 2.1 below.

Consistent with the Authority's allocation of risks (Table 2.1), it is proposed that risks identified by SunWater in items (a), (b), (d), (f) and (g) (in stakeholder submissions above) will be dealt with via an end-of-period adjustment, or price trigger or cost pass through upon application by SunWater or customers.

It should be noted that anticipated prudent and efficient electricity costs are reviewed as part of the Authority's analysis of efficient operating costs, and it is only if they are materially different to those forecast would there be a case to consider price triggers or cost pass throughs.

Metering upgrades (c) are outside the scope of the investigation. No levies or charges (e) are to be applied by the Authority as a result of this irrigation price review.

Table 2.1: Summary of Risks, Allocation and Authority's Recommended Response

<i>Risk</i>	<i>Nature of the Risk</i>	<i>Allocation of Risk</i>	<i>Authority's Recommended Response</i>
Short Term Volume Risk	Risk of uncertain usage resulting from fluctuating customer demand and/or water supply.	SunWater does not have the ability to manage these risks and, under current legislative arrangements, these are the responsibility of customers. Allocate risk to customers.	Cost-reflective tariffs.
Long Term Volume Risk (Planning and Infrastructure)	Risk of matching storage capacity (or new entitlements from improving distribution loss efficiency) to future demand.	SunWater has no substantive capacity to augment bulk infrastructure (for which responsibility rests with Government). SunWater does have some capacity to manage distribution system infrastructure and losses provided it can deliver its WAEs.	SunWater should bear the risks, and benefit from the revenues, associated with reducing distribution system losses.
Market Cost Risks	Risk of changing input costs.	SunWater should bear the risk of its controllable costs. Customers should bear the risks of uncontrollable costs.	End of regulatory period adjustment for over- or under-recovery. Price trigger or cost pass through on application from SunWater (or customers), in limited circumstances.
Risk of Government Imposts	Risk of governments modifying the water planning framework imposing costs on service provider.	Customers should bear the risk of changes in water legislation though there may be some compensation associated with National Water Initiative (NWI) related government decisions.	Cost variations may be immediately transferred to customers using a cost pass-through mechanism, depending on materiality.

Source: QCA (2011).

Allocation of Risk

The Authority notes comments by BFVG (2010b) regarding volume risk. The Authority has concluded in Volume 1 that SunWater does not have the ability to manage volume risks and under the current legislation and contractual arrangements (including the Ministerial Direction) customers must bear all efficient costs of supply.

In response to ISIS Sugar Partnership (2010), the Authority concluded in Volume 1 that the nature of risks is essentially the same in each scheme, and as a result the same regulatory arrangements are recommended to apply to each scheme. The scheme specific risks for the Bundaberg WSS and the Authority responses are outlined above.

In response to comments that SunWater has small revenue risk as irrigators are obliged to pay Part A charges regardless of water use, the Authority notes that SunWater incurs fixed costs to maintain full service capability irrespective of demand. As noted above, the Authority therefore considers it appropriate for volume risk to be borne by customers and the appropriate mechanism to do so is through cost-reflective tariffs and for Part A to reflect fixed costs.

Support for Price Cap

The Authority has recommended an adjusted price cap as the preferred form of price control. The ratio of the Part A and Part B tariffs depends on the ratio of fixed and variable costs as the

Authority agrees with BRIG's proposal to match the Part A charge to fixed costs and variable costs with Part B, as noted further in Chapter 3.

Other

In response to ISIS Sugar Partnership (2010), the Authority notes that both forms of regulation (revenue caps and price caps) provide a service provider with an incentive to reduce costs, at least until prices are reset in the future. Under the price cap, the service provider also has the incentive to increase sales. To further promote efficiency the Authority has recommended specific cost savings targets.

The Authority is not aware of any impediment that would be caused by the proposed tariff structure to the adoption of capacity sharing or continuous accounting.

2.3 Submissions Received from Stakeholders on the Draft Report

As outlined in Volume 1, the Authority notes that several submissions regarding the Draft Report's recommendations on the regulatory framework were received. These submissions primarily referred to how more accurate forecasts of electricity costs could be undertaken and how best to accommodate any variance between actuals and forecasts that occur during the 2012-17 regulatory period through mechanisms such as a cost pass through.

2.4 Authority's Response to Submissions Received on the Draft Report

As noted above, the Authority considers that only if costs are materially different to those forecast would there be a case to consider price triggers or cost pass throughs.

The Authority concluded that no compelling evidence had been put forward to change the approach recommended in the Authority's Draft Report.

3. PRICING FRAMEWORK

3.1 Tariff Structure

Introduction

During the 2005-06 price negotiations, it was generally agreed to adopt a 70:30 ratio of fixed costs to variable costs. However, due to the prevailing Government policy that there should be no real price decreases, the Bundaberg WSS Part A fixed charge was set at 52% and Part B variable charges at 48% of the total revenues.

Stakeholder Submissions

SunWater

SunWater (2011d) submitted that the fixed charge should recover fixed costs and the variable charge should recover variable costs.

Other Stakeholders

Stakeholders generally supported a two part tariff structure, although there were differences in stakeholders' preferences on the ratio of fixed to variable costs that should be recovered from each component. Specifically:

- (a) CANEGROWERS ISIS (2011) supported the continuation of a two-part tariff structure within the Bundaberg WSS;
- (b) CANEGOWERS ISIS (2011) considered that the 70/30 split is the right mix as it gives SunWater a level of security, while irrigators are not taking all the risk in years of limited water. Further, CANEGROWERS submitted that the Part B tariff should comprise a mix of fixed and variable costs including operating costs, repairs and maintenance costs; and
- (c) BRIG (2011) stated that fixed costs should be matched to Part A and variable costs matched to Part B. BRIG (2010e) noted that under this arrangement, much of the debate relating to the different levels of water use (availability and sales) was removed. BRIG (2011c) submitted that currently Part A is too small and Part B is too big and that most costs for the river irrigators are fixed;
- (d) BRIG (2010a) further stated that a tariff which matched more closely farm outgoings with income would interest some customers. There is potential for customers to be offered a choice of tariff structures.

On the efficiency implications of tariff structures:

- (a) CANEGOWERS ISIS (2010a) noted that a high Part A charge does nothing to improve water use efficiency whereas maintaining a high Part B charge will continue to foster water efficiency gains at the farm gate;
- (b) BRIG (2011c) submitted the current charges mean that water users are paying the costs of non-users and that irrigators are subsidising WAE holders that do not use any water;
- (c) BRIG (2011) noted that any variance from its proposed fixed costs in Part A and variable cost in Part B approach will increase the risk associated with SunWater's income. BRIG considered that the Authority develop a risk matrix which showed the impact this additional risk will have on the weighted average cost of capital (WACC) and water prices; and

- (d) BRIG (2011) submitted that charges per ML of use should be identical for medium priority and high priority users. The charge should be based on expected average announced allocation.
- (e) during the second round of consultations (2011), irrigators stated that there was no incentive for SunWater to reduce fixed costs when the fixed charge [Part A] is high.

On the timing of the charge, M and K Hetherington (2010) stated that paying the Part A fixed charge in advance – before receiving any water – means that many farmers are left with insufficient funds to draw the water to which they are entitled. M and K Hetherington noted that a pricing system with a minimum number of ML and a per ML charge (a take-or-pay arrangement) was more realistic as these ML are then applied to the crop and consequently improved productivity and reduces the risk to both parties.

Authority's Analysis

Tariff Structure

The Authority has, in Volume 1, analysed the tariff structure, and the efficiency implications of the tariff structure, to apply to SunWater's schemes.

The Authority considers that, in general, aligning the tariff structure with fixed and variable costs will manage volume risk over the regulatory period and send efficient price signals. To signal the efficient level of water use, the Authority recommends that all, and only, variable costs be recovered through a volumetric charge.

On this basis, the Authority recommends a Part A fixed bulk charge which reflects fixed costs and a Part B volumetric charge which reflects variable costs. The Authority does not accept CANEGROWERS' submission that the some fixed costs should be collected through the volumetric charge. This would expose SunWater to risk that it cannot manage (see chapter 2).

The Authority's analysis of which scheme costs constitute fixed, and which are variable costs, is addressed further below.

The Authority concurs with BRIG's (2011) view that, in aligning tariffs and costs, much of the debate relating to the different levels of water use (availability and sales) is removed.

In response to BRIG's (2010a) suggestion for tariffs to match farm outgoings, the Authority considers that a cost based approach, where the volumetric component reflects the marginal cost of the supply of water, sends the appropriate cost signals to both SunWater and irrigators.

Efficiency of Tariff Structures

In response to stakeholders concerns regarding efficiency, it is noted that efficiency is promoted as:

- (a) the volumetric charge is set to equal the anticipated costs of using an additional unit of water (the marginal cost), as this informs decisions by users. That is, the cost of supplying the additional unit of water is clear and customers can establish whether the benefit of using it exceeds its cost (PricewaterhouseCoopers (PwC), 2010a). Increasing the volumetric charge beyond its marginal cost will mean less water is used than available for consumptive purposes and farm output would be reduced;
- (b) the tariff structure signals the full fixed costs of holding WAE and provides an incentive for customers to reduce their WAEs, if they currently hold more than is necessary. This

incentive also applied to SunWater where it holds WAEs (other than where held for distribution losses);

- (c) in respect of setting tariffs to meet environmental objectives, the Authority notes that the institutional arrangements in Queensland administered by DERM establish the quantum, and allocation of water, between environmental and consumptive use. The Authority has been required to establish prices to recover SunWater's efficient business costs – to seek to achieve other broader goals would require a clear specification of those goals to enable the Authority to respond with relevant pricing recommendations.

Setting prices of delivered water at its true cost will also allow irrigators to make appropriate decisions about the need for, and nature of, any further on-farm initiatives to improve water use efficiency (which will in turn ensure that total farm costs, including associated environmental costs, are minimised over the longer term). The water planning framework needs to take into account and adjust allocations for consumptive purposes if the broader effects of current allocations for consumption are considered inappropriate; and

- (d) where a volumetric charge is relatively low (or zero) and, as a result, fixed costs are high, then there are incentives for customers to utilise all of an announced allocation. However, the appropriate degree of utilisation of capacity allocated for consumption can only be determined by irrigators (and other customers) in the light of market conditions for their products, in the knowledge of the cost of water delivered (including on-farm costs) and the understanding of the impact of changed water consumption on their farms.

The Authority has in, Volume 1, analysed the efficiency implications of the proposed tariff structure and the role of water trading in moving water to its highest value use. Moreover, the Authority also recognises that tariff structures are only part of a mix of institutional arrangements in Queensland designed to direct water to its highest and best use from the overall community perspective. In addition to these institutional arrangements, normal commercial profit motives and water trading are relevant to ensuring water is directed to its highest and best use.

The volumes of permanent and temporary water traded for Bundaberg WSS (across bulk and distribution system customers) are identified in Table 3.1.

Table 3.1: Volume of Permanent and Temporary Water Traded in Bundaberg WSS (ML)

	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
Permanent water traded	213	1,631	1,515	4,682	5,403	1,615	654	1,574
Temporary water traded	16,101	5,523	5,649	6,410	18,285	10,836	12,200	37,262

Note: The trading data above reflects total trading in the bulk and distribution system combined. Source: SunWater (2003-2010g) and Queensland Valuation Services (2010).

Timing of the Charge

In response to M and K Hetherington (2010), the Authority further notes that if SunWater collects Part A charges in arrears, rather than in advance, the additional financing costs arising from an increased need for working capital will need to be included in prices. Therefore, the Authority proposes to retain the existing arrangements of charging Part A in advance.

3.2 Water Use Forecasts

Introduction

During the 2006-11 price path, water use forecasts played an essential role in the determination of the tariff structure.

In the previous review, up to 25 years of historical data was collated for WAEs, announced allocations and volumes delivered. The final water usage forecasts were based on the long term average actual usage level. Where there was a clear trend away from the long term average, SunWater adjusted the forecast in the direction of that trend. Usage forecasts also took into account SunWater's assessment of future key impacts on water usage, such as changes in industry conditions, impact of trading and scheme specific issues (SunWater, 2006a).

For the Bundaberg WSS, SunWater assumed a water usage forecast of 60% for the calculation of the Part B charges over the 2006-11 price path. Water usage for high and medium priority irrigation WAEs were not separately identified (SunWater, 2006b).

Stakeholder Submissions

SunWater

The available supply of water is determined by the announced allocations which are set according to rules contained in the ROP.

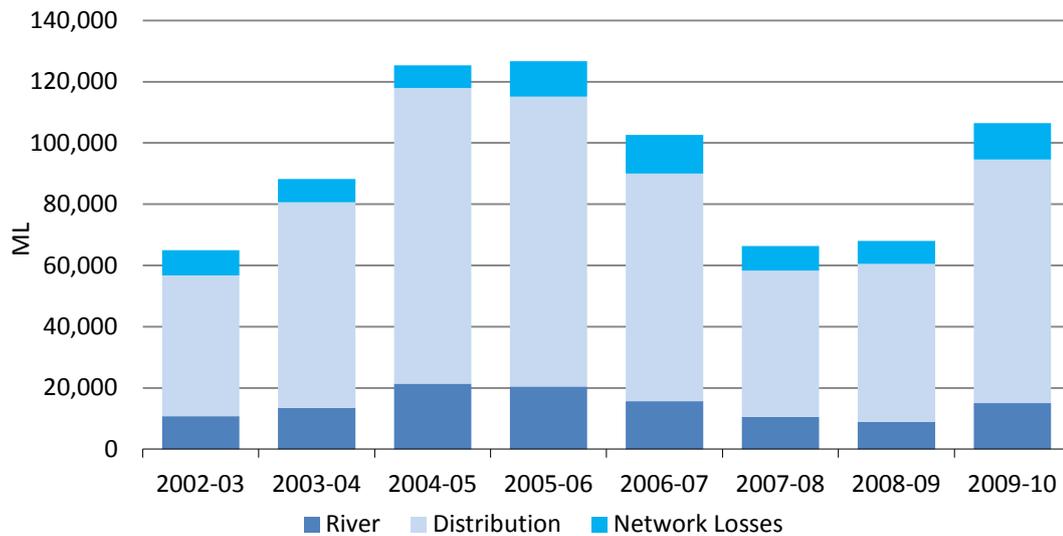
SunWater (2011d) has noted that demand forecasts are not relevant for price setting under SunWater's proposed tariff regime.

SunWater's usage forecasts for 2012-17 are made having regard to historic averages over an eight-year period and the usage forecast applied for the current price path. However, SunWater advised that usage of high priority and medium priority irrigation water cannot be separately identified, as holders of high priority WAEs also hold medium priority WAEs which passes through the same meter.

Based on the last eight years observations, SunWater has forecast use as follows:

- (a) at a whole scheme level (all sectors) – an average of 40% of WAEs (including SunWater's distribution loss WAEs and its other WAEs); and
- (b) for the irrigation sector only – 50% of WAEs, incorporating forecast usage of 80% within the distribution system. This compares with the eight-year average of 44%. Projected usage is higher than the eight-year average due to the impact of the past drought.

Figure 3.1 shows the historic usage information for the Bundaberg WSS submitted by SunWater (SunWater, 2011). The river category includes all irrigation and other usage sourced from the river. Distribution volumes refer to irrigation use only.

Figure 3.1: Water Usage for the Bundaberg WSS

Source: SunWater (2011f)

Other Stakeholders

BRIG (2010) and (2011) noted that much of the debate relating to the different levels of water use (availability and sales) is removed if fixed costs are matched to Part A and variable costs matched to Part B.

CANEGOWERS Isis (2011) stated that while storages are full, and given appropriate amendments to the Water Resource Plan and ROP, Bundaberg irrigators can be assured of a reasonable water supply for much of the 2011-2016 [now 2012-17] price path. However, they noted that they would not be as confident if the storage levels were not full.

M and K Hetherington (2010) submitted that water prices are having a detrimental effect upon water use.

Authority's Analysis

As noted in Volume 1, the Authority does not consider that water use forecasts are relevant to establishing cost-reflective prices for SunWater. The Authority agrees with BRIG that a water use forecast is not necessary to calculate prices if fixed costs are matched to Part A and variable costs matched to Part B.

Nonetheless, the Authority has considered past water use in calculating cost-reflective volumetric charges that recover variable costs (see Chapter 6 – Final Prices).

Under the Direction, the Authority must recommend prices that maintain revenues in real terms where current prices are above the level required to recover prudent and efficient costs. For this purpose, the Authority has considered forecast irrigation water use and corresponding submissions (see Chapter 6 – Final Prices).

3.3 Tariff Groups

The amended Ministerial Direction specifically directs the Authority to adopt the tariff groups as proposed in SunWater's NSPs.

The previous SunWater Irrigation Price Paths Final Report (2011t) nominated one tariff group, River, for the river segment of the Bundaberg WSS.

SunWater proposed in its NSP that the current bulk tariff group continue.

In accordance with the Ministerial Direction, the Authority will adopt the proposed tariff group for this WSS.

3.4 Paradise Dam

Introduction

The Paradise Dam is located on the Burnett River and was completed in 2006. It provides an additional 124,000ML of medium priority water and 20,000ML of high priority water to customers lying within the geographic boundary of the existing Bundaberg WSS. (These additional volumes are not part of the Bundaberg WSS subject to review by the Authority).

The Paradise Dam is owned and operated by Burnett Water, a wholly owned SunWater subsidiary.

The operations of Paradise Dam integrate with the existing storage infrastructure within the Burnett and Kolan river systems. The new water allocations resulting from the construction of the dam have been made available throughout the Bundaberg WSS. To date, a total of 11,229ML of WAEs from Burnett Water has been sold, and a further 3,279ML has been leased.

A letter from Minister Robertson, dated 28 September 2010, stated that the Authority has not been requested to recommend prices for water services provided by Burnett Water Pty Ltd and, therefore, for the purposes of this referral, the assets of Burnett Water Pty Ltd (that is, Paradise Dam and Kirar Weir) are not to be included in this review.

Draft Report

Stakeholder Submissions

SunWater

SunWater has advised that water charges for Paradise Dam are not relevant to the Authority's current review.

Other Stakeholders

Stakeholders raised a number of issues relating to the impacts of Paradise Dam on existing users, both in terms of bulk and distribution activities.

During the second round of consultations (April 2011), irrigators also stated that Paradise Dam has caused credit water to be removed so there is a lower standard of service and water reliability.

During the second round of consultations (April 2011), irrigators submitted that with the introduction of Burnett Water, SunWater distribution customers have experienced a reduced share of channel capacity. The irrigators questioned whether SunWater charges should be reduced to reflect a drop in service.

CANEGROWERS (2011) submitted that SunWater irrigators have experienced a 15% decrease of peak flow rate in the channel due to Burnett Water. Consequently, 15% of distribution costs, including distribution losses should be removed.

BRIG (2010) submitted that existing customers should not be paying for assets constructed to service new customers. BRIG stated that this was clearly outside the current agreement in relation to delivery of Paradise Dam water where channel capacity is limited. The sale of new allocation from Paradise Dam has constrained the flow rate available to south side irrigators when their supply is being pumped from Monduran (see Figure 3.2).

CANEGROWERS (2011) submitted that the new water out of Paradise Dam does not contribute towards the costs of running the bulk or distribution assets, except for electricity. They stated that this was despite the fact that the charges for Burnett Water reflect similar water charges to the old water plus a rate of return plus a capital charge when purchasing the water. Burnett Water customers have some access to SunWater channels in peak times and significant access in off-peak times. Burnett Water should pay for its share of channels and bulk water or it should not be permitted to use these assets.

BRIG (2011) commented that the Authority should further clarify the matter of Paradise Dam water pricing. BRIG noted that its concerns are related to the fact that SunWater delivers the old water (subject to the Authority's review) and the new Burnett water (not subject to the Authority's review) through the same distribution infrastructure. BRIG stated that the NSPs do not adequately address this issue and it is unclear how costs and income associated with the delivery of the new water are included in the information relating to old water pricing.

B Strathdee (2010) submitted that SunWater made water available from Paradise Dam on two occasions to growers only by application. A further charge of \$30/ML was made and the water had to be used within a certain number of days. Mr Strathdee suggests that this extra charge is unfair and that this extra charge and time limit is unfair.

N Baldwin (2010) submitted that an element of the yield of the Paradise Dam could be designated to service the currently held nominal allocations as opposed to capital sales of all the water which simply expands under supplied water allocations.

Authority's Analysis

The Authority accepted SunWater's view that pricing matters relating to Paradise Dam are outside the Authority's purview. However, the issues raised by stakeholders relate to cost allocation between existing and new allocation holders are relevant, as there could be implications for pricing for existing users. In addition, customers raised concerns as to whether there is a reduction in service standards for existing distribution system customers as a result of Burnett Water customers sourcing water through channels and, whether Burnett Water customers should contribute to existing distribution assets.

Service Standards

The Authority noted that the Paradise Dam and Bundaberg WSS operate as a single integrated system, but with separate charging arrangements for 'new' and old' customers. These charging arrangements were originally negotiated by SunWater and the irrigators' Customer Council.

Burnett Water customers can have SunWater deliver 'new' water to off-river irrigation activities through the existing channel system. This requires an additional supply contract and attracts additional charges.

In the Burnett Water Information Package (2005), SunWater sought to implement an arrangement to avoid a costly \$100 million channel system upgrade by offering delivery options involving:

- (a) peak period distribution services, without a capacity upgrade, for up to 15% of allocation served at each point (5% in Woongarra system); or

(b) off-peak distribution services.

SunWater has advised that the 15% spare capacity was estimated taking into account an assessment of current capacity and recent utilisation. The take-up of capacity by Burnett Water customers results in a potential slight reduction in service standard, in that customers that previously could take up to 1% of their allocation each day can now take 0.95% of their allocation each day.

The Authority accepted that this is a slight reduction in service standards from that prevailing. However, it is noted that the approach taken is likely to be much cheaper for all customers as it avoids channel system upgrades, at least in the short term.

In response to comments made in round two consultation regarding credit water, the Authority sought further advice. Credit water was a temporary drought-related product arrangement to enable Burnett River irrigators to source water from weir releases from the Burnett River when announced allocations were below 100%. This credit water was in addition to announced allocation volumes. SunWater advised that the ability to provide this product was removed when the Burnett ROP was implemented, and was not a direct result of Paradise Dam.

Share of Distribution Costs

The pricing arrangements for Burnett Water customers are set out in the Burnett Water Information Package (2005).

Based on this, the Authority noted that Burnett Water users pay a higher price than Bundaberg WSS customers. The 2011-12 Burnett Water prices compared to Bundaberg WSS prices for are shown in Table 3.2.

Table 3.2: Comparison of Burnett Water and SunWater charges

	<i>Burnett Water</i>		<i>SunWater</i>
	<i>Medium Priority</i>	<i>High priority</i>	<i>Medium priority</i>
Initial purchase price for WAE	852	2562	-
Bulk charge – Part A	33.19	94.26	7.36
Bulk charge – Part B	11.47	11.47	11.47
Channel charge – Part C	23.52 to 57.36 (peak) ¹ 8.24 to 42.12 (off-peak)	23.52 to 57.36 (peak) ¹ 8.24 to 42.12 (off-peak)	39.04
Channel charge - Part D	20.25	20.25	20.25
Fixed channel charge	\$244 up front or 36.64 annually (peak) \$121 up front or 18.32 annually (off-peak)	\$244 up front or 36.64 annually (peak) \$121 up front or 18.32 annually (off-peak)	-

Note: 1 – Part C channel charges are set according to 5 segments in the Bundaberg Distribution system. Source: SunWater (2011).

The same variable (Part B) charges apply to Burnett Water and Bundaberg WSS customers, as there are no separate customer meters for ‘old’ and ‘new’ water.

For Burnett Water, the additional 'Part C' charges vary on a segment basis. There are five segments according to the scheme sub-systems – Abbotsford, Gin Gin/Bingera, Gooburrum, Isis and Woongarra. The lowest charge of \$8.24/ML is for off-peak water in the Gooburrum system. The highest charge is \$57.36/ML for peak supplies in the Abbotsford system.

As an example, a medium priority Burnett Water user in the Gin Gin/Bingera system will pay a Part A Burnett Water river charge (\$33.19/ML), a Part B Bundaberg WSS river charge (\$11.47/ML), a Part D Bundaberg distribution system channel charge (\$20.25/ML). The segment Part C charge is \$32.68/ML for peak supplies or \$17.44/ML for off-peak. This total of \$97.59/ML for peak supplies compares to a charge of \$78.12/ML for existing users (all 2011-12 charges). In addition, Burnett water users pay an initial purchase price of \$852/ML and a fixed distribution service charge of \$244/ML for peak use or \$121/ML for off-peak use.

As indicated in the Burnett Water Information Package (2005), the Part C charge will be indexed at the consumer price index (CPI) for 10 years and a record kept of costs and revenues to assess performance against lower bound cost recovery. The Part C charge was intended to cover additional electricity costs attributable to Burnett Water. Any surplus revenues accrued over the 10-year period from these charging arrangements will be used to offset any additional operating and maintenance costs and contribute to capital works required to deliver future 'new' water. The Burnett Water Information Package (2005) indicates that the charges are not set to make a profit for SunWater. The charges for 'old' and 'new' water may be merged if considered reasonable after 10 years (that is 2015-16) or when more than 65,000ML are sold into the channel system, whichever occurs first. However, water from Paradise Dam would still attract an upfront capital charge. The Authority considered that the merger of the charges may be best implemented at the start of the next price period (2017-18) to avoid confusion regarding prices in 2015-16 and 2016-17.

In effect, in return for existing users accepting unchanged Part B charges, all additional costs including electricity and future marginal costs including capacity costs are passed through to 'new' customers. In the long term, existing customers should benefit to the extent that lower bound costs for the overall scheme should be more easily met with the addition of new WAEs.

Of further note, the existing arrangements as described above were negotiated between Burnett Water and irrigator groups on behalf of irrigators at the time that 'new' allocations were made available. It is clear that Burnett Water customers are, by paying the same Part B charges as Bundaberg WSS irrigators, covering their share of marginal (variable) costs for the Bundaberg WSS. However, they are also making a significant contribution to distribution system costs, by means of the long term arrangement that is in place to manage any surplus revenues for the benefit of all irrigators.

The Authority considered that, as Burnett Water is taken up, and the two schemes ultimately merge, the bulk fixed costs should decline on a per ML basis. Until they are merged, there is no scope for unit savings to be achieved in the bulk component of the scheme.

However, the Authority noted that, in the distribution system, the additional volumes should result in slightly lower costs per ML, in the absence of any channel system capacity upgrades.

The Authority therefore did not propose to make any adjustments to lower bound bulk costs in the Bundaberg WSS in response to the availability of 'new' water. However, distribution system fixed costs are proposed to be apportioned across all volume supplied through the distribution system, including water sourced from Burnett Water, for the purposes of determining lower bound costs.

In response to comments made at round two consultation and CANEGROWERS, allocating costs to Burnett Water customers will decrease the portion of costs allocated to SunWater distribution system customers.

SunWater's NSP details the electricity costs in the Bundaberg WSS attributable to the Burnett Water users assuming a volume of 3,410ML at a cost of \$28.45/ML. As noted above, there is no proposed contribution to distribution system costs that would otherwise result in a revenue offset for existing users.

SunWater has advised that distribution services are provided for a total of 5,832ML of Burnett Water contracts (including 2,483ML peak) and a further 2,515ML of leased Burnett Water (all off-peak). SunWater's estimate of 3410ML in the NSP reflects the expected level of usage of these WAEs (about 41%).

In response to CANEGROWERS, BRIG, Strathdee and Baldwin, Paradise Dam [Burnett Water] charges are beyond the scope of this review.

Stakeholder Submissions Received on the Draft Report

Irrigators at the round 3 consultation submitted that channel users have lost 15% of their peak capacity to Burnett Water and [Burnett Water customers] should be allocated 15% of the distribution system fixed costs. ISIS Central Sugar Mill (2012) and CANEGROWERS Isis (2011a) also submitted that 15% of all distribution system costs excluding electricity should be allocated to Burnett Water.

BRIG (2011e) submitted that if large amounts of new [Burnett Water] allocation are sold during the price path, the price determination should allow the Authority to recalculate tariffs, taking into account the additional SunWater income.

Irrigators at round 3 consultation considered that ROP compliance costs should be entirely allocated to Burnett Water users as they relate to Paradise Dam. Similarly, BRIG (2011e) submitted that ROP compliance costs were not incurred until Paradise Dam was built. BRIG submitted that Burnett Water should meet ROP compliance costs, and requests the Authority to examine this issue to ensure correct cost allocation.

Authority's Response to Submissions on the Draft Report

The Authority's cost allocation method is described in detail in Chapter 6, and allocates fixed costs to all WAE holders that use the distribution system, including Burnett Water customers. Fixed costs are allocated on the basis of WAE, rather than utilisation of peak capacity. Burnett Water customers currently hold 5.6% of total WAE in the distribution system, and are therefore allocated 5.6% of the fixed costs. The Authority's modelling for the Draft Report only took into account the WAE included in SunWater's NSP and as a result did not adjust for Burnett Water WAE. This error has been corrected for the Final Report to reflect cost allocation on the basis of all WAE, including that held by Burnett Water customers. This acts to decrease the cost-reflective Part C charges relative to those presented in the Draft Report.

The Authority acknowledges that the amount of Burnett Water WAE used in the distribution system may increase during the price path as available WAE is purchased. The Authority has not attempted to forecast the uptake of available Burnett Water WAE for allocating costs and has allocated costs based on current WAE held. The Authority accepts BRIG's submission that further sales of Burnett Water into the distribution system increase the WAE across which fixed costs can be spread, enabling a smaller \$/ML cost to be recovered from each WAE holder.

Any material \$/ML cost reduction due to a larger amount of WAE in the distribution system should therefore be passed to distribution customers. This may occur within period, or at the end of the period, depending on materiality. The Authority will consider stakeholder submissions to this effect during and at the conclusion of the regulatory period.

In relation to ROP compliance costs, the Authority is required to accept SunWater's tariff groups, which do not include a separate tariff group for Burnett Water users of the Distribution System. As a result, the Authority does not consider that it can allocate SunWater's ROP compliance costs directly to Burnett Water customers that use the Distribution System.

The Authority notes that SunWater must comply with the ROP, and will incur costs of doing so. The Authority believes that the consideration of whether SunWater is incurring ROP compliance costs relating to Paradise Dam is not a matter of cost allocation, but of prudence. The Authority considers that any ROP compliance expenditure incurred by SunWater on Paradise Dam is not prudent and should not be recovered through SunWater's tariffs. Such costs should be incurred by Burnett Water and recovered from all Burnett Water customers, not just those that use the SunWater Distribution System. However, the Authority has no jurisdiction to recommend costs or tariffs for Burnett Water.

In the absence of a detailed review of ROP compliance costs, the Authority does not consider that SunWater's ROP compliance expenditure is imprudent and has therefore made no specific adjustment to these costs. However, the Authority notes that 5.6% of Distribution System fixed costs, including ROP compliance, are allocated to Burnett Water customers due their WAE holding (rather than as a separate SunWater tariff group).

3.5 Gin Gin Main Channel – Allocation of costs to Bulk water Services

Draft Report

SunWater's Submission

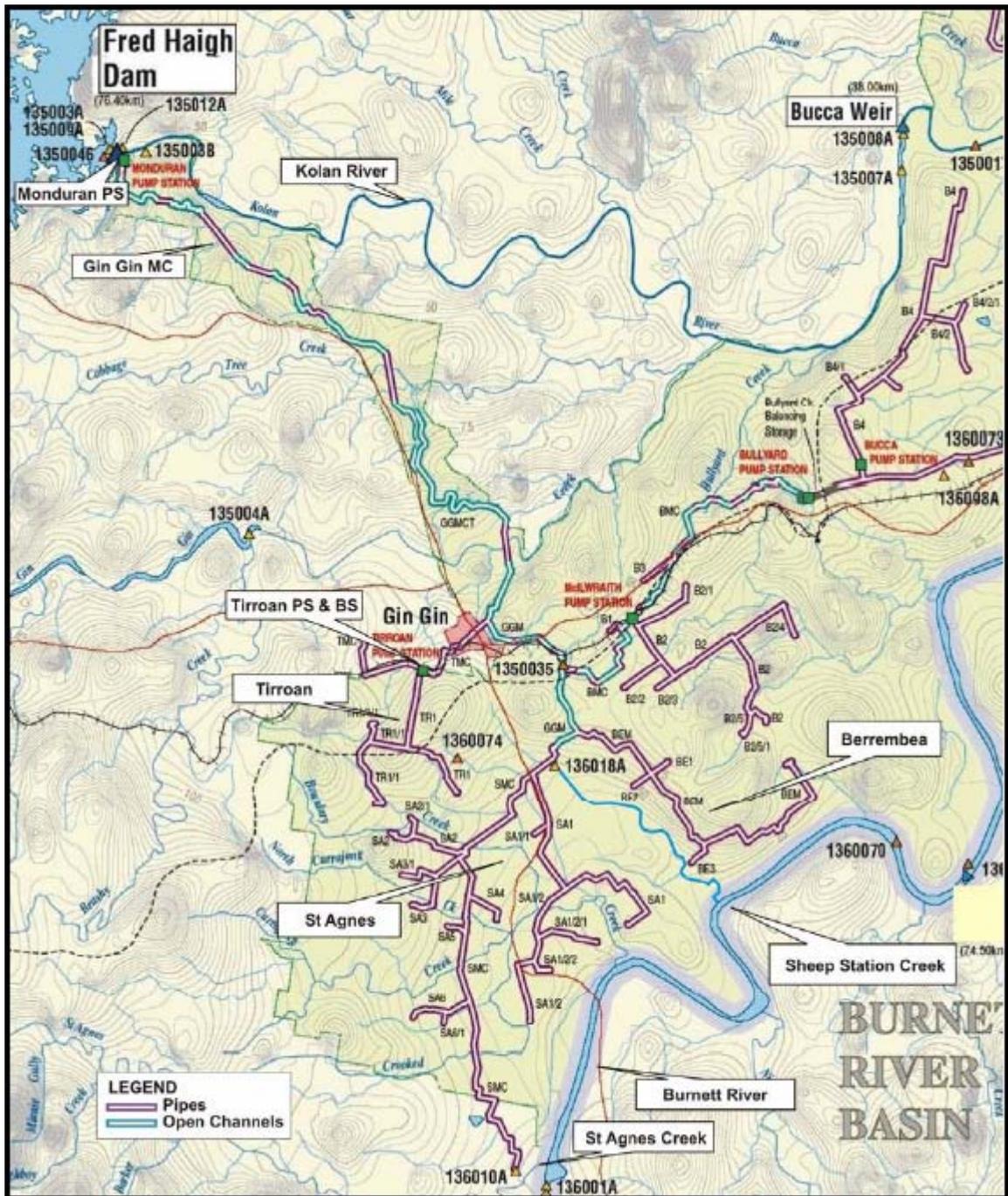
In the Bundaberg WSS NSP, a provision of 8% of the lower bound costs of Gin Gin main channel and the Monduran pump station are included in bulk costs. This reflects the occasional need to pump water from the Kolan system to supplement supplies in the Burnett.

SunWater proposed that the costs of the Gin Gin Main Channel that should be attributed to bulk are equivalent to \$118,000 in the 2010-11 year. This covers an 8% share of operating costs including electricity, indirect costs and overheads and the renewals annuity associated with the pump station and the channel. However, SunWater has not included the adjustment in its proposed operating costs for Bundaberg WSS and Bundaberg Distribution systems in its NSPs.

Subsequent to the receipt of the NSPs, SunWater proposed to the Authority that the total cost transfer from the distribution system to the bulk scheme was \$61,000 in 2012-13. This amount includes \$12,000 of renewals annuity and \$49,000 of operational expenditure.

The Gin Gin distribution system is shown in Figure 3.2.

Figure 3.2: Gin Gin Distribution System



Source: SunWater (2011)

Other Stakeholders

BRIG (2011) commented that the bulk water NSP for Bundaberg is not a simple storage model with a portion of distribution costs for Gin Gin channel being included to cover the transfer of water from the Kolan River to the Burnett River. BRIG questioned the magnitude of this transfer as it expects SunWater will use the unsold water in Paradise Dam instead of pumping water from the Kolan River.

BRIG (2011) stated that it does not expect there to be much water transferred from the Fred Haigh Dam to the south side due to unsold water in Paradise Dam.

CANEGROWERS (2011) submitted that the use of channel infrastructure for the bulk system needs to be reviewed. In this case, 8% of the costs of the Gin Gin main channel and associated pump station are attributed to the bulk system. CANEGROWERS submitted that if any deemed bulk customers are using any part of the channel infrastructure, they should be paying the same channel charge as growers within the channel system for the proportion of their allocation which is typically delivered through the distribution system.

Authority's Analysis

For the 2006-11 review, the Tier 1 Working Paper No. 14 indicated that, in relevant schemes, a proportion of the costs of relevant pump stations and main channels would be allocated to irrigators in supplemented streams. However, the Tier 1 Report for the 2006-11 price path did not provide any details of the actual proportion of any distribution costs attributed to bulk users in the Bundaberg WSS.

The Authority notes that the Burnett ROP makes provisions for transfer of water under certain conditions:

- (a) when Fred Haigh Dam is above 59.13m Australian Height Datum (AHD) and Paradise Dam is between 52.8m AHD and 46.3m AHD, the first 760ML/day demand on the Burnett River downstream of the confluence of Sheepstation Creek less the volume required for the Gin Gin-Bingera system, is to be supplied from Fred Haigh Dam; and
- (b) when Fred Haigh Dam is above 59.13m AHD and Paradise Dam is below 46.3m AHD, water may be released from Fred Haigh Dam to meet the demand on the Burnett River downstream of the confluence of Sheepstation Creek.

In further requests for information, SunWater advised that the Integrated Quantity and Quality Model (IQQM) was used to model the total channel flow volumes at the channel intake and total channel outflows to supplemented watercourses in the simulation period of more than 100 years.

With the addition of Paradise Dam, the need for any additional pumping and use of the Gin Gin Main Channel to supplement the Burnett River will be much reduced. SunWater has advised that the 8% factor represents a proportion that is likely to be pumped from the Kolan to the Burnett over the longer term, assuming full take-up of Paradise Dam WAE, but also taking into account ROP constraints.

The Authority notes that, with the large volume of unused WAE in Paradise Dam, and given current capacity levels (100% in both Fred Haigh and Paradise Dams) the likelihood that Gin Gin Channel will be used as a bulk asset is very low for the foreseeable future.

However, given the requirements of the ROP, it is clear that Gin Gin Channel serves a bulk water function and it is appropriate that a proportion be allocated to bulk. As long as the ROP

makes such provision, a relevant portion of the Gin Gin Main Channel should be included in bulk water costs.

The Authority has no reason to reject the outputs of the IQQM and proposes to accept SunWater's revised cost transfer of \$61,000 in 2012-13.

In relation to submissions:

- (a) as noted by BRIG, there is scope for additional flows from Paradise Dam to reduce the need for transfers from Fred Haigh Dam. However, this is limited under the ROP rules; and
- (b) in relation to CANEGROWERS' comment, the Authority considers that, where possible, prices should reflect costs incurred in service provision. Bulk customers use only a proportion of total distribution assets, and in circumstances where an asset has joint usage, it is appropriate that bulk customers be allocated a share of the costs commensurate with their relative usage of the asset.

The Authority notes that such a principle, if applied more widely, would be consistent with cost reflective segment-based or nodal pricing. However, the Ministers' Direction requires the Authority to adopt only the tariff groups as identified in SunWater's NSPs and not to adopt any additional nodal pricing structures. The proposed cost allocation approach for part of the distribution system cost to be met by bulk customers remains consistent with the Ministers' Direction as it does not change the existing tariff groups nor introduce new nodal charges.

Stakeholder Submissions Received on the Draft Report

BRIG (2011e) reiterated its concerns that it did not expect much water to be transferred through from Fred Haigh Dam due to the large amount of unsold water in Paradise Dam. BRIG requested further investigation of the hydrological modelling.

Irrigators during round 3 consultation also requested more detail about the calculation of cost allocation to the bulk system, including how the \$61,000 was calculated, which electricity price was used and whether the average or the Gin Gin specific pumping costs are adopted.

Following the Draft Report, SunWater submitted that the IQQM methodology to determine the allocation of channel costs to bulk schemes – including the \$61,000 allocation of costs to the bulk system – is the most appropriate for estimating the longer term volume of water transfers under existing ROP rules and is an appropriate basis for allocating the cost transfer.

SunWater (2012a) submitted that it is appropriate to use the IQQM data for this purpose and it contains the best data available.

Authority's Response to Submissions on the Draft Report

The Authority notes that, due to the ROP, some proportion of channel costs should be allocated to the bulk system. The Authority considers that the potential benefit of a detailed review of SunWater's IQQM modelling in relation to this matter is limited, particularly given the above lower cost nature of the bulk scheme.

The Authority therefore accepts SunWater's IQQM modelling and proposes no change to its Draft Report recommendation.

4. RENEWALS ANNUITY

4.1 Introduction

Ministerial Direction

Under the Ministerial Direction, the Authority is required to recommend a revenue stream that allows SunWater to recover prudent and efficient expenditure on the renewal and rehabilitation of existing assets through a renewals annuity.

The Ministerial Direction also requires the Authority to have regard to the level of service provided by SunWater to its customers.

Previous Review

In 2000-06 and 2006-11, a renewals annuity approach was used to fund asset replacement for SunWater WSSs.

As discussed in Volume 1, the renewals annuity for each WSS was developed in accordance with the Standing Committee for Agriculture and Resource Management (SCARM) Guidelines (Ernst & Young, 1997) and was based on two key components:

- (a) a detailed asset management plan, based on asset condition, that defined the timing and magnitude of renewals expenditure; and
- (b) an asset restoration reserve (ARR) to manage the balance of the unspent (or overspent) renewals annuity (including interest).

The determination of the renewals annuity was then based on the present value of the proposed renewals expenditure minus the ARR balance.

The allocation of the renewals annuity between high and medium priority users was based on water pricing conversion factors (WPCFs). Separate ARR balances were not identified for bulk and distribution systems.

Issues

In general, a renewals annuity seeks to provide funds to meet renewals expenditure necessary to maintain the service capacity of infrastructure assets through a series of even charges. SunWater's renewals expenditure and ARR balances include direct, indirect and overhead costs (unless otherwise specified).

The key issues for the 2012-17 regulatory period are:

- (a) the establishment of the opening ARR balance (at 1 July 2012), which requires:
 - (i) whether renewals expenditure in 2007-11 was prudent and efficient. This affects the opening ARR balance for the 2012-17 regulatory period;
 - (ii) the unbundling of the opening ARR balance for bulk and distribution systems (where applicable);
 - (iii) the extension of the opening ARR balance (calculated for 1 July 2011) to 1 July 2012 to account for the adjusted timelines specified in the amended Ministerial Direction;

- (b) the prudence and efficiency of SunWater's forecast renewals expenditure;
- (c) the methodology for apportioning bulk and distribution renewals between medium and high priority WAEs; and
- (d) the methodology to calculate the renewals annuity.

The Authority's general approach to addressing these issues is outlined in Volume 1.

The Authority notes that SunWater has estimated that it has under management about 50,000 assets relevant to irrigators and, given this number of assets, has developed an asset planning methodology designed to cost-effectively identify assets requiring renewal or refurbishment.

Some of the assets were renewed during the 2006-11 price paths. Others are eligible for renewal over the 2012-17 regulatory period. Depending on their asset life, some are renewed several times during the Authority's recommended 20-year planning period.

It was therefore not practicable within the timeframe for the review, nor desirable given the potential costs involved, to assess the prudence and efficiency of the renewal of every individual asset.

The Authority initially relied on its four principal scheme consultants: Arup, Aurecon, GHD and Halcrow to identify and comment on SunWater's renewals expenditure items. However, the Authority's four consultants expressed concerns about the lack of timely information relating to the past and proposed expenditures at the time of their reviews.

Subsequently, the Authority liaised directly with SunWater to obtain further information, and commissioned Sinclair Knight Merz (SKM) to address material expenditure items (that is, those renewals items which represented more than 10% of the present value of forecast expenditure) and/or those of particular concern (usually in response to customers' submissions). Across all schemes, a total of 36 past and forecast renewals items were reviewed by SKM.

The Authority's assessment of the prudence and efficiency of proposed renewals expenditures therefore draws upon the contributions of all of these sources as detailed below.

4.2 SunWater's Opening ARR Balance (1 July 2006)

The 2006-11 price paths were based on the opening ARR balance at 1 July 2006.

SunWater submitted that the opening balance for the Bundaberg WSS (including the Bundaberg Distribution System) was \$547,000.

For the Draft Report, the Authority accepted SunWater's unbundled opening ARR balance for Bundaberg (excluding the Bundaberg Distribution System) of \$120,000.

The Authority's unbundled ARR balance reflected SunWater's proposed methodology for the separation of bulk and distribution system assets, which takes into account past and future renewals expenditure (see Volume 1).

In the Draft Report, the Authority indicated that in October 2011 Indec had uncovered actual renewals expenditure for 2000-06. The Authority was unable to review or quality assure this information for the Draft Report but stated its intention to do so for the Final Report.

For the Final Report, the Authority has used the actual renewals expenditure for bulk and distribution assets over the period to revise the opening 1 July 2006 balances accordingly (see Volume 1).

The 1 July 2006 opening ARR balance for the Bundaberg WSS is revised to negative \$395,000, a decrease on the Draft Report estimate.

4.3 Past Renewals Expenditure

Draft Report

As noted in Volume 1, the Authority has reviewed the prudence and efficiency of selected renewals expenditures over the 2006-11 price path. The Authority has also sought to compare the original expenditure forecasts underlying the 2006-11 price path with actual expenditure, to establish the accuracy of SunWater's forecasts.

Submissions

SunWater

SunWater (2011) submitted actual renewals expenditure for the Bundaberg WSS for 2006-11 (Table 4.1) in real terms as at 2010-11. This expenditure included indirect and overhead costs which are subject to a separate review by the Authority (see Chapter 5 – Operating Costs). SunWater advised that it was unable to provide the forecast renewals expenditure (approved for the 2005-06 review) for this period.

These estimates reflect SunWater's most recent information (including that received by the Authority in September 2011 relating to renewals expenditure) and differ from SunWater's NSP.

Table 4.1: Past Renewals Expenditure 2006-11 (Real \$'000)

	2006-07	2007-08	2008-09	2009-10	2010-11
Renewals Expenditure	160	289	527	709	1,067

Note: The estimates reflect the most recent information provided by SunWater to the Authority in September 2011. Source: SunWater (2011).

Other Stakeholders

CANEGROWERS (2011) submitted that past renewal expenditure, in particular that over the past two years needs to be investigated further and validated. CANEGROWERS (2011) submitted that there was a large renewals spend in the last six years.

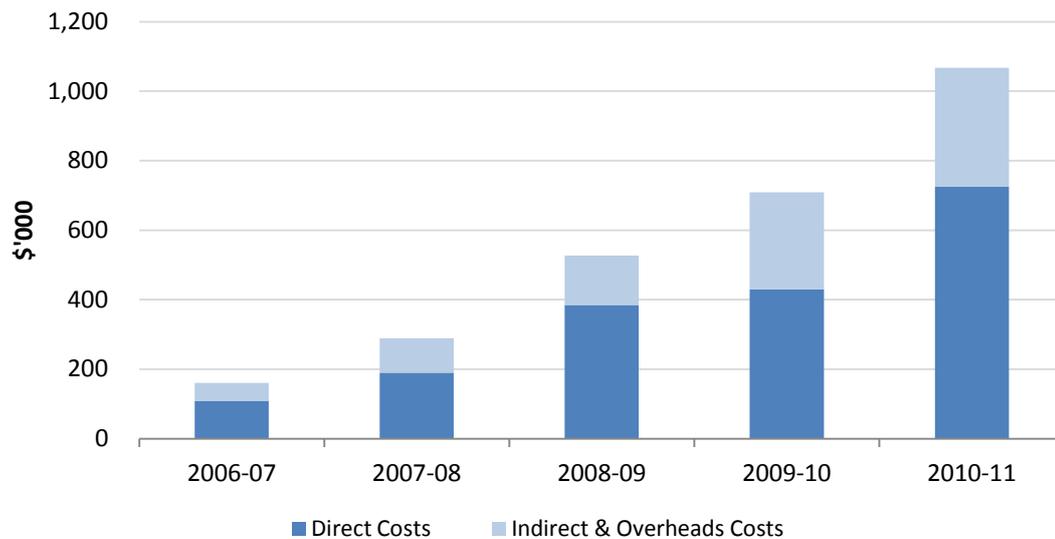
CANEGROWERS (2011) questioned whether a cost benefit analysis was done on the asset replacement options, or were assets simply replaced at set times.

During the second round of consultations in April 2011, customers stated that they would like to see a full list of past renewal expenditure and that renewals expenditure over the past two years for the bulk scheme needs to be investigated further. Customers also queried whether SunWater reviewed past expenditure to monitor if the new equipment worked according to plan.

Authority's Analysis

Total Renewals Expenditure

The total renewals expenditure over 2006-11 is detailed in Figure 4.1 below. Indirect and overhead costs are addressed in a following chapter.

Figure 4.1: Past (Actual) Renewals Expenditure 2006-11 (Real \$'000)

Note: The estimates reflect the most recent information provided by SunWater to the Authority in September 2011. Source: Indec (2011d).

In response to stakeholder requests for a full list of past renewal expenditure, the Authority advises that a list of renewals expenditure by scheme was compiled by Indec and is available on the Authority's website.

Stakeholder Submissions Received on the Draft Report

CANEGROWERS Isis (2011a) submitted that it seems that the capital replacement program is determined by anticipated life of the asset rather than its real life. CANEGROWERS Isis considered that equipment should only be replaced as required not by a measurement of time.

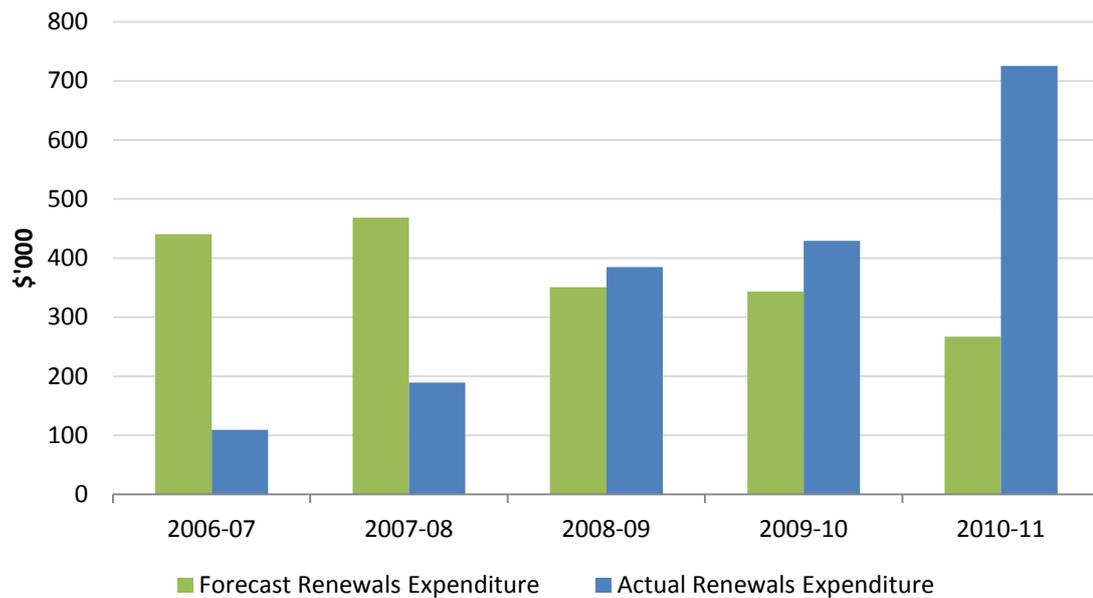
Authority's Response to Submissions Received on the Draft Report

The Authority notes that while long term asset renewal planning undertaken by SunWater is based primarily on asset life, SunWater does undertake asset condition assessments to inform renewals expenditure in the near future. The Authority considers that an approach to asset renewal planning to places more emphasis on renewals expenditure in the near future is appropriate. This adequacy of SunWater's asset planning has been discussed in more detail in Volume 1, and has been assessed on an item by item basis by the Authority's consultants (see future renewals items below).

Comparison of Forecast and Actual Costs

The Authority was able to source details of forecast direct renewals expenditure from Indec, who undertook the analysis for the 2005-06 review.

A comparison of forecast and actual direct renewals expenditure in the Bundaberg WSS for 2006-11 is shown in Figure 4.2.

Figure 4.2: Direct Renewals Expenditure 2006-11 (Real \$'000)

Note: The estimates reflect the most recent information provided by SunWater to the Authority in September 2011. Source: Forecast (Indec, 2011d) and Actuals (SunWater, 2011k).

Actual renewals expenditure was \$32,000 (direct costs) below that forecast over the period.

Review of Past Renewal Items

In response to stakeholder concerns about past renewals expenditure, particularly over the past two years, Aurecon was appointed to review the efficiency (and prudence where not previously approved) of past renewals items.

In the absence of forecast renewals expenditure for 2006-11 from SunWater (as noted above), Aurecon sought to identify variances between annually budgeted (Board approved) and actual expenditure for certain items.

Aurecon noted a number of limitations in the general past renewals information provided by SunWater including:

- (a) no indication of the Board approved budget for all items in 2006-07;
- (b) totals include indirect and overhead costs, and any proposed changes in allocation methods by the Authority will impact renewal activity costs;
- (c) many items run over several financial years, in which the Board approved budget only appeared in the first year, and not subsequently. Further there was difficulty linking activities across years, due to the nature of the database provided; and
- (d) the summation of annual totals within the database did not equate with stated renewals expenditure in the NSP.

In addition to general comments on past renewals information, Aurecon assessed the prudence and efficiency of past renewals at one bulk water asset.

Items 1 to 3: Ben Andersen Barrage – refurbish shutters

Draft Report

SunWater

The shutters have been in operation since 1984. An asset life of 50 years is assigned, indicating replacement in 2033-34 (replacement cost estimated at \$2.15 million).

At the Ben Andersen Barrage, there has been significant ongoing expenditure as follows:

- (a) 2007-08 – A renewals item to refurbish and remove 10 shutters, 20 tie arms & anchors. However, out of an allocated budget of \$90,903, SunWater spent \$61,941;
- (b) 2009-10 – A renewals item to remove and refurbish 10 shutters with an allocated budget of \$134,120. However, SunWater only replaced five shutters at a cost of \$57,315; and
- (c) 2010-11 – A renewals item to refurbish 10 shutters with an allocated budget of \$180,189. As at February 2011, SunWater had spent \$75,084.

Other Stakeholders

CANEGROWERS (2011) submitted that it may be possible to replace shutters at Ben Andersen Barrage more efficiently.

Consultant's Review

Aurecon noted that there was a structured process employed in regards to this on-going expenditure at the Barrage including:

- (a) internal documentation supporting the requirements for works. Aurecon sighted a number of condition assessments undertaken between 2006 and 2009, which allocated scores of 4 for a number of shutters due to coating failure and deep rust;
- (b) Aurecon also reviewed an expert engineering report by JLR Engineering Services Pty Ltd (2008) Ben Anderson Barrage Shutter Maintenance, which examined the merits of alternative options. Aurecon suggested that this analysis re-examine the NPV analysis undertaken evaluating the merits of replacing the shutters with stainless steel. Aurecon recommended that the modelling analysis timeframe should have been extended reflecting the extended life expectancy of stainless steel. The report also highlighted that the NPV analysis was highly price sensitive to stainless steel prices, and recommended that better quotations be sought;
- (c) research was on-going with alternative coating systems trailed in recent years to identify the optimal protective coating;
- (d) substantial internal documentation highlighting the management approval process; and
- (e) detailed financial accounts highlighting historical expenditure and works completed.

Aurecon noted that:

- (a) the replacement of shutters was a major on-going refurbishment program with significant investment requirements;
- (b) SunWater had employed transparent and logical asset management process to date;

- (c) the removal and subsequent re-installation of refurbished shutters is undertaken by SunWater staff. The actual refurbishment work of shutters undertaken by external contractors; and
- (d) the proposed annual refurbishment program has not been fully implemented to date due to a number of drivers including reassessment of shutter conditions, and environmental conditions restricting access to the shutters.

Based on the information reviewed, site inspection, and discussions with SunWater staff, Aurecon viewed the historical expenses in 2007-08 and 2009-10 as prudent and efficient. Aurecon did not provide a recommendation on the expenditure incurred during 2010-11.

Authority's Analysis

The Authority accepted Aurecon's recommendation that the refurbishment of shutters at Ben Andersen Barrage in 2007-08 and 2009-10 was prudent and efficient. On this basis, the Authority also considers the 2010-11 expenditure was prudent and efficient and proposes no change for the Final Report. .

In response to stakeholder queries about whether SunWater undertakes cost-benefit analysis for asset replacement, the Authority noted that Aurecon found that SunWater had undertaken a NPV options analysis. Given SunWater's obligation to maintain service standards of its assets, the Authority considers a NPV options analysis, as observed in this instance, to be similar to a formal cost-benefit analysis.

Item 4: Flood Damage Repair at Ben Anderson Barrage

Subsequent to the Draft Report, the Authority reviewed a number of additional renewal items to increase the portion of SunWater's renewals program subject to intensive review. The flood damage repair works at Ben Anderson Barrage was included in the Authority's extended renewals sample due to its significant cost of \$724,417.

SunWater submitted a total cost for flood damage repairs in the Bundaberg WSS of \$777,673 for 2010-11, and \$914,997 for 2011-12.

However, SunWater subsequently submitted that insurance revenue was also expected to be received, which would offset some of the flood repair costs. SunWater sought that this submission remains confidential as the negotiations with the insurer are still ongoing.

The Authority engaged SKM to review the expenditure at Ben Anderson Barrage.

SKM's Review

This project concerns the repair of the flood damage that occurred to the Ben Anderson Barrage during the late December 2010 and January 2011. The downstream left bank embankment was severely damaged in the two flood events. The erosion to the left bank rendered the access road leading to the downstream left bank of the barrage unserviceable and prevented the access to the barrage crest, collapsible shutters and the gantry located downstream of the left bank. The flood also damaged some parts of the protection works on the right bank.

In its review, SKM viewed SunWater's SAP Works Management System (WMS), and asset condition and risk assessment policy and procedures. In addition, the following information was available for this review:

Table 4.2 SKM's Reviewed Documents

<i>Document No.</i>	<i>Document Name</i>	<i>Document Title</i>	<i>Date</i>
1173532	1173532-v1- Erosion_and_access_road_Repair_ _Ben_Anderson_Barrage	Erosion and Access Road Repair Ben Anderson Barrage – 11BIA56	
1027404	1027404-v1- LB_Flood_Damage_Repairs_Scope	Project Scope Definition – Ben Anderson Barrage – Flood Damage Repairs to Downstream Left Bank [BIA-BURN- BARR-EMBK] – COMMERCIAL – IN - CONFIDENCE	10/02/2011
1069929	1069929-v1- Before_and_After_Photos_of_BAB_St age_1_(Erosion_Repair).DOC	Photos of Before and After Shots on BAB Stage 1 (Erosion Repair)	
5111886	Work Method Statement – Ben Anderson Barrage Left Bank Erosion Repair - 5111886	BIA-BURN-BARR Ben Anderson Barrage Left Bank Erosion Repair (WHS10_F1, Rev:9)	06/2009
5113343	Construction Safety Plan For Ben Anderson Barrage Left Bank Access Road Repair – 5113343	Construction Safety Plan For Ben Anderson Barrage Left Bank Access Road Repair – 5113343 (WHS10_F2, Rev: 3)	
5111886	HSE PROJECT RISK ASSESSMENT FORM for Ben Anderson Barrage Left Bank Erosion Repair - 5111886	HSE PROJECT RISK ASSESSMENT FORM for Ben Anderson Barrage Left Bank Erosion Repair – 5111886 (WHS15_F1)	06/2009
1066938	Memorandum- Ben Anderson Barrage Left Bank Erosion	Status Update of Ben Anderson Barrage Left bank Abutment	18/01/2011
1066938	QLeave Notification and Payment Form		04/04/2011
5113343	Contractors/ Suppliers Evaluation Scoresheet to Supply and Install Access Road on BAB Stage 1 Extension	Contractors/ Suppliers Evaluation Scoresheet	04/2011
5112733	Memorandum – BAB L/B Protection Works Repair	Ben Anderson Barrage Left bank Erosion Repair – CURRENT UPDATE	19/08/2011
1065861	Contour \$ Detail Survey Erosion Area on West Bank of Burnett River – Ben Anderson Barrage (Contour \$ Detail Survey Erosion Area on West Bank of Burnett River – Ben Anderson Barrage)	Contour \$ Detail Survey Erosion Area on West Bank of Burnett River – Ben Anderson Barrage	03/2011
1173975	1173975-v1- Task_1b_Quote_on_Ben_Anderson_Ba rrage_L_Bank	Excel Spreadsheet	11/01/2011
1177343	1177343-v1- Tas1122904_Draft_Scope_for_Ben_An derson_Barrage_Flood_Repairs_(11BI A56).DOC	Project Scope Definition – Ben Anderson Barrage – Right Bank Flood Damage Repairs – COMMERCIAL – IN - CONFIDENCE	22/09/2011

Prudency Review

A brief history of the project is presented below:

- (a) 1974 - Completion of the construction of Ben Anderson Barrage on Brunett River. The Barrage was constructed using earth and rockfill core with concrete crest and shutters;
- (b) June 2008 - The last five yearly inspection of the barrage was conducted. The report indicated that the bank protection was generally in good condition;
- (c) December 2010 – Major flooding during late December 2010 and January 2011 eroded a part of the downstream left bank embankment. The erosion caused extensive damage to the access road leading to the downstream left bank of the barrage and prevented access to the barrage crest, collapsible shutters and the gantry located downstream on the left bank;
- (d) January 2011 – Temporary repairs were carried out, a cost estimate prepared for this work was undertaken on 11 January 2011 – Hummingbird #1173975;
- (e) 18 January 2011 – A SunWater internal memorandum states that *“It appears that the extent of damage is increasing slowly as compared to the previous photos taken only last week. It can clearly be seen that another meter has eroded and should this continuously happen, major works will have to be done as this erosion is very close to the barrage itself”*. The memorandum contained photos showing the extent of the damage and indicated the approximate fill volumes that would be required;
- (f) February 2011 - The report: ‘Project Scope Definition: Ben Anderson Barrage – Flood Damage Repairs to Downstream Left Bank’ was prepared by SunWater. This document outlines the proposed works to repair the flood damage. The cost estimate for the above works was estimated at the time at \$225,986. This document stated that the works should be completed within the 2010-11 financial year;
- (g) March 2011 – The repair of the flood damage at the Ben Anderson Barrage started; and
- (h) September 2011 – Rock erosion on the right bank downstream near the concrete drain was identified. The report ‘Project Scope Project Scope Definition – Ben Anderson Barrage – Right Bank Flood Damage Repairs’ was prepared to include the repair of the flood damage to the right bank. The work included the replacement of the damaged geotextile and rock protection, shotcreting in between the rock protection to provide long term bank stability. The report also recommended monitoring the land slippage below the access road corner for possible future remediation.

SunWater has undertaken the last five yearly inspection of the Ben Anderson Barrage in June 2008. The report stated that *“The concrete rockfill erosion protectionon the left bank... is in good condition.....On the left bank downstream of the concreted rockfill, there has been some erosion.....The area should be backfilled with rockfill to prevent further erosion”*. The report rated the repair to the left bank as critical “rating 3” i.e. that rectification was required within 12 months. Although no documentation was provided to SKM to indicate that this remedial work was carried out, SKM made the assumption that the repair work was carried out to the left bank in accordance with the recommendations.

The flood events during December 2010 – January 2011 eroded part of the left bank embankment and the access road that prevented access to the barrage crest, collapsible shutters and the gantry located downstream of the left bank. A SunWater internal memorandum dated 18 January 2011 states that *“It appears that the extent of damage is increasing slowly as*

compared to the previous photos taken only last week. It can clearly be seen that another meter has eroded and should this continuously happen, major works will have to be done as this erosion is very close to the barrage itself". The memorandum contained photos showing the extent of damage.

SunWater carried out temporary emergency repairs immediately after the December 2010 flood event. A cost estimate prepared by SunWater after the December flood has been used to determine the extent of the works proposed.

SKM understood that SunWater made two scope changes to include the repair of the flood damage that were not in the original scope. The comments column in document '1169338 - Flood Damage Projects FY 2010 - Dec 31 2011.XLS' refers to the additional work as being the repair to the access road; and replacing the geotextile and reinstating the rock pitching to the right bank. The latter was detailed within the project scope definition dated 22/09/2011. The scope included the replacement of the damaged geotextile and placing of shotcrete between the rocks to provide long term bank stability. Details regarding SunWaters' estimated cost for the additional works were not available for SKM's review. SKM noted that this work was undertaken by a commercial contractor that was appointed by making use of a competitive tender process.

No WH&S or environmental risks have been recorded for this asset.

From the review of the data in SAP, SKM considered that SunWater has followed the policies and procedures that it has in place to determine the asset replacement/refurbishment date determination.

SunWater repaired the flood damage with a "like for like" solution. The documentation provided by SunWater did not contain any options investigation. SKM considered that the approach taken by SunWater to be an appropriate solution and that the development of an options study for this flood damage repair work was not required.

The emergency repairs undertaken after the December floods was driven by the fact that the event occurred mid rainy season and was based on limiting the impact that a future flood within the same rainy season could have on the structural integrity of the Ben Anderson Barrage.

The timing of the repair work was driven by the fact that the embankment repair work had to be completed before the next rainy season to ensure the structural integrity of the barrage was ensured and to re-establish access to the barrage crest and the gantry downstream of the barrage. The work commenced in March 2011, to complete the work within 2010-11. However the additional works, as identified above, which were identified and scoped during the construction period had the knock on effect of extending the construction period to October 2011.

SKM considered the timing of this refurbishment to be prudent.

SKM considered that the SunWater has followed their policies and procedures in undertaking the flood repair to the Ben Anderson Barrage. SKM further considered that the flood repairs to the left and right embankments were prudent and undertaken in a timely manner.

Efficiency Evaluation

SunWater prepared a cost estimate of \$178,121 after the December 2010 flood event to repair the left bank embankment. The scope of work was undertaken where SunWater acted as principal contractor and sub contracted third parties to undertake components of the work.

SunWater prepared a cost estimate of \$225,989 after the flood event in January 2011 to repair the left bank. The estimate prepared by SunWater did not include for their indirect cost component, nor did it allow for a contingency.

A total of \$728,417 was spent to complete the project and SKM understood that this includes all the costs associated with construction. From the comments section of the 'FLOOD DAMAGE PROJECTS WMS DOWNLOAD EXPENDITURE FY 2010 - DEC 31 2011' document, SKM noted that the works scope had changed on two occasions to include the repair of damages that had not originally been identified.

The table below shows the actual construction cost and SunWaters' indirect cost, deemed to include for construction monitoring.

Table 4.3: Project Expenditure

<i>No.</i>	<i>Description</i>	<i>SunWater Total Expense (\$)</i>
1	SunWater Indirect Costs	
1.1	Overheads	178,969
1.2	Other Indirect costs	1,316
	<i>Subtotal A</i>	<i>180,286</i>
2	Construction Costs	
2.1	Commercial Contractors	415,845
2.2	Materials	52,741
2.3	Equipment	7,201
2.4	Labour	72,343
	<i>Subtotal B</i>	<i>548,131</i>
3	Total (Subtotal A+ Subtotal B)	728,416

From the table above, SKM deduced that SunWaters' indirect cost component was 32.9% of the construction cost, this is slightly higher than the 30.8% that is recorded within the SAP BOM for cost estimation purposes. The slightly higher percentage of indirect cost to construction cost can be attributed to a number of factors such as the in-house design and repair works carried out post the December 2010 flood, sourcing of the material from RoadTek, re-design after no material could be sourced, additional project management time required to include and complete the right bank flood damage works and accelerated time frames to effect the repairs before another flooding event occurred during that rain.

SKM made the assumption that Items 2.2 to 2.4 in the table above are concerned with the temporary repair undertaken after the December 2010 flood event. The extent of the temporary repair has not been able to be established.

From the review of the available documents, SKM understood that SunWater appointed a contractor making use of a competitive tender process in accordance with SunWater's procurement processes and State purchasing policy to undertake the works to repair the flood

damage after the January 2011 floods. SKM therefore considered that Item 2.1, in the above table, is efficient on the basis that the contractor costs were based on market rates.

SKM considered that SunWater undertook the temporary repair works to the Ben Anderson Barrage in a timely manner although the extent has not been established. SKM further considered the flood damage repair was undertaken in accordance to SunWater's policies and procedures for competitive procurement and therefore the contractor costs represent market rates and are hence efficient.

SKM's Summary and Conclusions

SKM concluded that the flood damage repair that was undertaken at the Ben Anderson Barrage is prudent and undertaken at the appropriate time. SKM considered that the project followed the SunWater Procedures and Policies to complete the repair work and cost associated with the project is considered efficient at \$728,417.

Final Report

The Authority accepts SKM's recommendation that the flood damage work at Ben Anderson Barrage is prudent and efficient.

SunWater has advised that the 2010-11 flood damage repair costs are included in its proposed renewals expenditure and the 2011-12 flood damage repair costs are additional to its proposed renewals expenditure.

As outlined in Volume 1, the Authority reviewed a sample of flood damage repairs across SunWater's schemes. The sampled items accounted for 30% of total flood repairs. SKM found that all sampled items were prudent and efficient.

However, the Authority notes that if flood damage repair costs are to be included then so should any offsetting insurance revenues. As insurance revenues are yet to be determined, the Authority has not included flood damage repairs costs in prices.

Therefore, once the insurance matter is settled, SunWater may apply for an adjustment to prices to account for the flood damage expenditure and revenue, or the ARR balances will be adjusted during the next regulatory review.

Item 4 - Intersafe

In the Authority's Draft Report, Intersafe expenditure in the Bundaberg distribution system was not specifically noted.

SunWater indicated that this project was not included in the 2006-11 price paths, however, SunWater decided to undertake the work following a report from Intersafe recommending that SunWater take action to reduce the safety risk to staff. Expenditure was \$133,000 in 2009-10 in the Bundaberg distribution system.

The Authority engaged SKM to review Intersafe expenditure. SKM (2011) concluded that:

- (a) SunWater's procedures were robust and, by developing standard infrastructure, implementation costs will have been reduced through economies of scale;
- (b) given the nature of the works, it was appropriate for SunWater to develop a program of works to implement the identified solutions as swiftly as reasonably possible; and

- (c) the costs incurred by SunWater in implementing the works have been subjected to competitive forces and hence can be considered as market costs.

The Authority accepted Intersafe expenditure as prudent and efficient.

Conclusion

Draft Report

In the Draft Report, renewals expenditure at Ben Andersen Barrage over two separate years was sampled and was found to be prudent and efficient.

As noted in Volume 1, after a consideration of all its consultants' reviews, the Authority recommended that a 10% saving be applied to all non-sampled and sampled items for which there was insufficient information.

Final Report

Subsequent to the Draft Report, the Authority reviewed additional renewals items and concluded that they are prudent and efficient. Flood damage repair costs have been excluded pending the resolution of insurance claims. The Authority also included Intersafe expenditure for 2009-10 that was also considered prudent and efficient.

As outlined in Volume 1, the Authority undertook further sampling of past renewals expenditures across SunWater's schemes. After consideration of this further work, the Authority recommended that a 4% saving be applied to all non-sampled and sampled past renewals items for which there was insufficient information.

In total, the Authority recommends the expenditure be adjusted as summarised in Table 4.2.

Table 4.4: Review of Selected Past (Direct) Renewals Expenditure 2006-11 (Real \$'000)

<i>Item</i>	<i>Date</i>	<i>SunWater</i>	<i>Authority's Draft Report Findings</i>	<i>Draft Recommended</i>	<i>Authority's Final Report Findings</i>	<i>Final Recommended</i>
Sampled Items						
1. Ben Andersen Barrage refurbish shutters	2007-08	\$61,941	Prudent and efficient	\$61,941	Prudent and efficient	\$61,941
2. Ben Andersen Barrage – refurbish shutters	2009-10	\$57,315	Prudent and efficient	\$57,315	Prudent and efficient	\$57,315
3. Ben Andersen Barrage – refurbish shutters	2010-11	\$75,084	Prudent and efficient	\$75,084	Prudent and efficient	\$75,084
4. Flood damage repairs	2010-11 and 2011-12	777,000 in 2010-11 and 915,000 in 2011-12	Not sampled	10% saving on 2010-11 cost, 2011-12 not included	Prudent and efficient, but excluded pending resolution of insurance claims	\$0
5 - Intersafe	2010	133,000	N/a	10% saving applied	Prudent and efficient	133,000
Non-Sampled Items				10% saving applied		4% saving applied

Source: SunWater (2011), Aurecon (2011) and QCA (2011).

4.4 Opening ARR Balance (at 1 July 2012)

Draft Report

SunWater

SunWater indicated that the renewals opening ARR balance for 1 July 2011 was negative \$1,388,000 for the Bundaberg WSS. This estimate reflects the most recent information provided by SunWater to the Authority in September 2011 and differs from that included in the NSP of negative \$1,305,000.

Other Stakeholders

CANEGROWERS (2011) submitted that the opening renewal balance is negative \$1.305 million and suggested that the large negative starting balance means that the annuity is much greater than future spending and renewals annuity is 33% of total costs.

BRIG (2010) noted that the renewal income was greater than renewal expenditure and questioned whether the renewal annuity was funding operational cash requirements. BRIG also queried whether a return on capital will be sought on future renewals.

BRIG (2010) stated that the most recent SunWater annual report suggested that SunWater holds \$1.5 million paid by existing customers for scheme refurbishment. BRIG contended that these funds (should) be retained for the scheme under any new pricing system.

BRIG (2011) sought clarification as to why there was a negative renewals annuity balance.

BRIG (2011) noted that SunWater appeared to be proposing that the current positive whole of scheme renewals annuity balance be divided so that the bulk scheme has a negative \$1.3 million balance in 2011-12 and the distribution scheme has a positive \$2.29 million balance. BRIG stated that river irrigators for many years have been paying well above lower bound prices and the Part A/Part B tariff split was amended in the previous review to partly address this issue. BRIG considered that this cross-subsidy was then deployed to reduce the channel irrigator's charges and that it can be argued that SunWater's current proposal perpetuates this cross-subsidy. BRIG considered this to be unfair and suggested that at the very least the bulk water balance should be set at zero.

Authority's Analysis

Based on the Authority's assessment of the prudence and efficiency of past renewals expenditure in the Draft Report and SunWater's proposed methodology for unbundling ARR balances, the recommended opening ARR balance for 1 July 2011 for Bundaberg was negative \$1,141,000.

The Authority calculated the opening ARR balance at 1 July 2011 by:

- (a) adopting the opening balance as at 1 July 2006;
- (b) adding 2006-2011 renewals annuity revenue;
- (c) subtracting 2006-2011 renewals expenditure; and
- (d) adjusting interest over the period consistent with the Authority's recommendations detailed in Volume 1.

For the Draft Report, to establish the closing ARR balance as at 30 June 2012 of negative \$1,505,000, the Authority:

- (a) added forecast 2011-12 renewals annuity revenue;
- (b) subtracted forecast 2011-12 renewals expenditure; and
- (c) adjusted for interest over the year.

The closing ARR balance for 30 June 2012 is the opening ARR balance for 1 July 2012.

In response to BRIG's (2010) submission, the Authority noted that forecast renewals annuity exceeds forecast renewals expenditure in order to recoup the negative ARR balance.

In response to BRIG's (2010) submission that SunWater holds \$1.5 million for scheme refurbishment, the Authority noted that it has calculated ARR balances from a 1 July 2006 starting point, and confirms that the ARR balance at the starting point of the regulatory period for Bundaberg WSS is not \$1.5 million.

The Authority notes that the reason for the negative 1 July 2012 ARR balance is largely due to actual renewals expenditure exceeding renewals annuity revenues over the 2006-12 period.

In response to BRIG's (2011) concerns about the apportionment of ARR between bulk and distribution, the Authority noted that both SunWater's and the Authority's methodologies apportion the ARR at 1 July 2006. As noted above, the main driver of a negative 1 July 2012 ARR balance in the bulk scheme is a relatively high level of expenditure over the 2006-12 period.

The build-up of ARR in the distribution system is in anticipation of a relatively large future renewals program over the planning period, particularly in 2019-24 and 2032-35. The divergence in ARRs is therefore not caused by the split of ARR undertaken in 1 July 2006. As a consequence, there is no evidence that the bulk ARR should be set at zero.

Stakeholder Submission Received on the Draft Report

Subsequent to the Authority's Draft Report, stakeholders during round 3 consultation further queried the ARR balances. Irrigators questioned why there is a negative renewals balance when the scheme has been paying above lower bound costs. Irrigators noted that even though the bulk scheme was above lower bound cost, the ARR balances influence the bundled price paid by distribution customers.

This view was also expressed by BRIG (2011e), the ISIS Central Sugar Mill (2012) and CANEGROWERS Isis (2011a).

Authority's Response to Submissions Received on the Draft Report

Once the Government set the 2006-11 price paths, the basis for renewal revenues was effectively approved. The preceding regulatory framework did not provide for under and over adjustments – SunWater bore the risk of under or over-recovery in most schemes.

Indeed, in aggregate SunWater under-recovered previous estimates of cost. It is not appropriate to change those regulatory arrangements nor to adjust for an individual cost item. The Authority's review of past renewals expenditure is only relevant to the estimates of future costs and prices, not for the treatment of above lower bound revenues in 2006-11. As a result, the Authority considers that above lower bound revenues during the 2006-11 cannot be considered in setting the ARR balance for 1 July 2012.

The Authority has revised its Draft Report estimate of the 30 June 2012 ARR to take account of the key changes since the Draft Report as outlined above including:

- (a) a change in the 1 July 2006 opening ARR balance from the use of actual renewals data. The 2006 opening balance is lower (now negative) than in the Draft Report;
- (b) the application of a 4% saving to non-sampled items and sampled items for which there was insufficient information, rather than 10% in the Draft Report; and
- (c) removal of the previously included flood damage repair costs for 2010-11 and inclusion of two new items (including Intersafe) that were assessed as prudent and efficient.

As a result of its revised analysis, the Authority estimated the 1 July 2011 ARR to be negative \$1,421,000. The Authority has re-estimated the opening ARR balance for 1 July 2012 as negative \$1,824,000.

4.5 Forecast Renewals Expenditure

Planning Methodology

Draft Report

The Authority reviewed SunWater's Asset Management Planning Methodology in Volume 1 and recommended improvements to its current approach, including:

- (a) high-level options analysis for all material renewals expenditures expected to occur over the Authority's recommended planning period (20 years), with a material renewals expenditures being defined as one which accounts for 10% or more in present value terms of total forecast renewals expenditure;
- (b) detailed options analysis (which also take into account trade-offs and impacts on operational expenditures) for all material renewals expenditures expected to occur within the first five years of each planning period; and
- (c) SunWater to adopt the Authority's consultants' suggested improvements for forecasting renewals expenditure.

Submissions Received from Stakeholders on the Draft Report

SunWater submitted that:

- (a) the costs of undertaking options analysis (and associated activities including consultation) are excessive (\$445,000 annually for all schemes);
- (b) these costs are to be allocated exclusively to the irrigation sector; and
- (c) although some of the Authority's consultants' suggested improvements have merit, they all involve additional cost. SunWater sought to implement only those that demonstrate a net-benefit.

Authority's Response to Submissions Received on the Draft Report

In response to SunWater, and as outlined in Volume 1, the Authority considers that:

- (a) the cost of the options analyses is acceptable when compared to SunWater's total renewals expenditure (\$14.5 million in 2011-12). In addition, SunWater's estimated \$445,000 does not include the savings associated with options analyses;
- (b) the cost of carrying out options analyses should be met by all water users (including irrigators and non-irrigators where they exist) in the relevant service contract; and
- (c) SunWater should review its renewals planning process (taking into account the Authority's consultants' suggested improvements) and provide a copy of the review to Government and the Authority by 30 June 2014.

As noted in Volume 1, the Authority has not, therefore, amended its draft recommendations regarding SunWater undertaking high-level and detailed options analyses. The Authority has, however, modified its draft recommendation as noted in (c) above.

Prudence and Efficiency of Forecast Renewals Expenditure

Submissions

SunWater

SunWater's proposed renewals expenditure for the Bundaberg WSS is presented in Table 4.3 as provided in its NSP (submitted prior to the Government's announced interim prices for 2011-12).¹

Table 4.5: Forecast Renewals Expenditure 2011-16 (\$'000)

<i>Facility</i>	<i>2011-12</i>	<i>2012-13</i>	<i>2013-14</i>	<i>2014-15</i>	<i>2015-16</i>
Ben Anderson Barrage	450	294	176	184	427
Bucca Weir	-	-	-	8	-
Fred Haigh Dam	242	61	310	317	58
Kolan Barrage	-	-	-	-	10
Ned Churchward Weir	131	32	-	62	35
Total	823	387	486	571	530

Source: SunWater (2011).

The major items incorporated in the above estimates are:

- (a) Ben Anderson Barrage – undertake rolling shutter refurbishment program at an estimated cost of \$861,000 from 2011-12 to 2015-16. Due to their condition, 10 shutters will be refurbished each year over the regulatory period to maintain them in working condition;
- (b) Ben Anderson Barrage – replace hydraulic control at an estimated cost of \$193,000 in 2015-16. The control system at Ben Anderson Barrage requires replacement based on asset life and condition;
- (c) Ben Anderson Barrage – replace anodes at an estimated cost of \$217,000 in 2011-12. The corrosion protection anodes at Ben Anderson Barrage will be replaced as they have reached the end of their service life;
- (d) Ned Churchward Weir – refurbish upstream sheet piling at an estimated cost of \$119,000 in 2011-12. The sheet piling on the upstream side of the weir requires refurbishment to maintain long term corrosion protection. The need for this work was identified during a safety inspection; and
- (e) Fred Haigh Dam – replace electrical cables main wall at an estimated the cost of \$619,000 from 2013-14 to 2014-15. These cables are approaching the end of their design life and require replacement. The work will occur over two years.

The major expenditure items from 2016-17 are:

¹ SunWater's forecast renewals expenditure reviewed in this chapter do not include the adjustment for Gin Gin Channel (Chapter 3). This adjustment is included in the Authority's proposed renewals annuity.

- (a) refurbish 10 shutters at Ben Anderson Barrage; at Fred Haigh Dam, 20-year safety review and at Ned Churchward Weir, replace fish trap elements at an estimated total cost of \$435,000 in 2019-20;
- (b) reinstate rockfill at the Ben Anderson Barrage at an estimated cost of \$200,000 in 2035-36; and
- (c) replace upstream guardrail and handrails Fred Haigh Dam at an estimated cost of \$176,000 in 2035-36.

SunWater's forecast renewal expenditure items greater than \$10,000 in value, for the years 2011-12 to 2035-36 in 2010-11 dollar terms are provided in **Appendix A**.

Other Stakeholders

CANEGOWERS (2011) submitted that the impact of the floods on renewals needs to be considered. A number of assets have been affected by floods and some will be covered under insurance. This may mean that a number of forecast renewals activities may not be required as previously planned.

CANEGOWERS (2011) noted that there appeared to be a greater focus on the next five years compared to the latter 20 years. CANEGOWERS considered that all major expenditures have a similar impact on the renewals annuity especially with a low WACC and so equal focus should be placed on all high cost items across the renewals time period chosen.

CANEGOWERS (2011) commented that the cost savings associated with the modernisation in renewals expenditure, especially for items beyond year 5, need to be considered. For example, renewals expenditure in year 6 of \$5 million will have a very significant effect on renewals annuity. However, any cost savings that may occur from this item would not be picked up in the five-year operational expenditure forecast. CANEGOWERS questioned that if in NPV terms half of the \$5 million in renewals expenditure is covered by cost savings, should \$5 million or \$2.5 million be used as renewals expenditure in year 6.

CANEGROWERS ISIS (2011) submitted that SunWater should model asset replacement options and replace assets if more efficient technology is now available that would deliver net savings to irrigators.

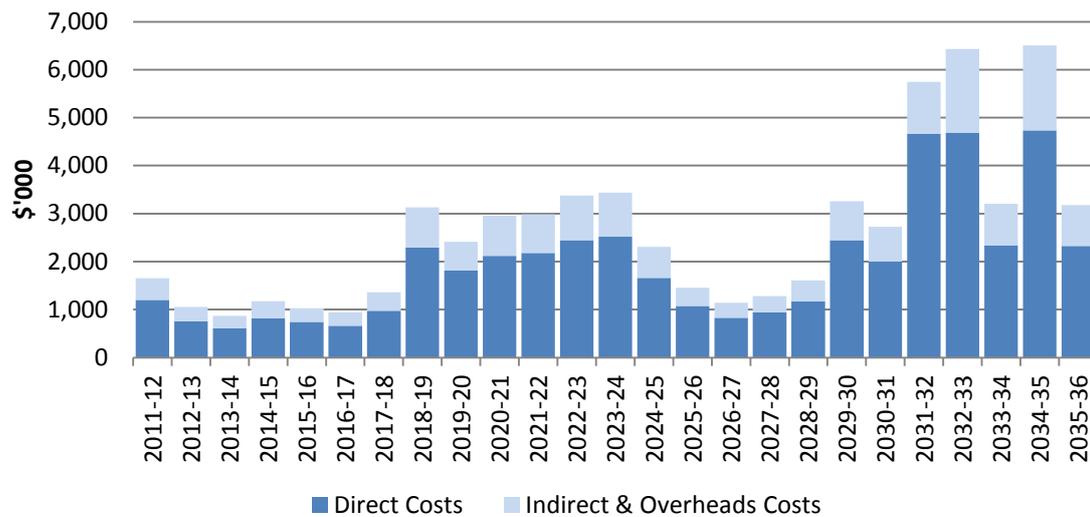
BRIG (2010) sought a dedicated sinking fund to cover future asset maintenance and renewals.

During the second round of consultations (April 2011), irrigators noted that service standards imposed by SunWater are all the same throughout State when this may not be appropriate. Irrigators considered this to be a significant issue for renewals.

Authority's Analysis

Total Costs

SunWater's proposed renewals expenditure for 2011-36 for the Bundaberg WSS is shown in Figure 4.3. This reflects the most recent renewals information provided by SunWater to the Authority in September 2011, and differs from the NSP. The Authority has identified the direct cost component of this expenditure, which is reviewed below. The indirect and overheads component of expenditure relating to these items are reviewed in Chapter 5 – Operating Costs.

Figure 4.3: Forecast Renewals Expenditure 2011-36 (Real \$'000)

Source: SunWater (2011am). Note: Corrected for minor data error in Draft Report.

In response to CANEGROWER'S (2011) concerns regarding the impact of flood damage and associated insurance revenue on renewals balances, the Authority noted in Volume 1 that it has yet to receive and consider submissions from SunWater regarding the impacts of the 2010-11 floods (including any related insurance revenues). SunWater has advised that it will submit renewals expenditure data relating to flood damage repairs, after the deadline for the Authority's Draft Report.

In response to CANEGROWERS' (2011) and CANEGROWERS ISIS's (2011) concerns about modernisation of renewals expenditure, the Authority notes SKM's (2011) findings (see Volume 1) that renewals expenditure projects expected to commence more than five years from the planning date are estimated by SunWater from unit rates listed in a Bill of Materials (BoM) based on like-for-like replacement. For renewals forecast to occur within five years, SunWater applies an estimation based on the cost for recent similar works undertaken.

The Authority notes that there is a trade off between forecasting accuracy and planning costs incurred by SunWater, and accepts the recommendation of its consultants that SunWater's renewals forecasting approach is prudent in this regard.

In response to BRIG's (2010) request for a dedicated sinking fund for renewals expenditure, the Authority notes that the Ministerial Direction requires the Authority to adopt a renewals annuity.

The Authority notes irrigators' concerns that service standards are the same across the state, but notes that the Standard Supply Contracts allow SunWater, following consultation with customers, to alter service standards on a scheme by scheme basis.

Review of Future Renewals Items

As for past renewals expenditure, Aurecon and SKM have reviewed the prudence and efficiency for a sample of items. To respond to CANEGROWERS (2011) concerns about focussing on the next five years of renewals, the Authority notes that the sample of renewals projects was identified based on the impact on renewals annuities. While projects forecast to occur in the next five years will have a relatively greater impact on annuities to distant projects, the comparative size of the expected expenditure is also a key determining factor.

Item 1: Fred Haigh Dam Replacement of Cables and Cableways

Draft Report

SunWater

This renewals item is for the replacement of cables and cableways at Fred Haigh Dam in the Bundaberg WSS at a total cost of \$619,000 (including direct and indirect costs) in 2013-14 and 2014-15.

The replacement renewals item submission encompasses the replacement of both high voltage (HV) (11kV) and low voltage (LV) cables through a main dam wall and includes for the replacement of conduits and a light pole.

According to SunWater's Systems, Applications, and Products (SAP) Works Management System (WMS), the asset has been in operation since 1975 and was installed as part of the original construction works of the dam. The estimated value for the entire replacement renewals item as shown in SunWater's SAP-WMS is approximately \$474,000. SunWater has suggested that the work will be undertaken in two parts over the period 2014-2015.

SunWater has not provided information to indicate how the works are to be split, or which assets are to be replaced at each stage. SunWater has submitted a renewals item value of \$250,000 for phase 1 of replacement of the existing cable through the main wall in 2013-14. A further \$250,000 is planned to be spent in 2014-15 to complete the works.

Other Stakeholders

No other stakeholders have commented on this item.

Aurecon's Review

Aurecon's review of the SAP extracts indicates that an asset life of 35 years is assigned to this asset, and that the cables have been in existence since 1975 indicating a need for replacement in 2009-10, although condition assessments indicate that they are still functioning well. The 35-year frequency is consistent with SunWater's adopted asset lives for these assets, and in this case the assets have exceeded the asset life assigned. SunWater plans to undertake a study in 2012-13 to scope works that will be required in 2013-14 and 2014-15.

SunWater also provided an extensive BoM for the proposed replacement works, along with forecast unit rates for inputs, predominately cable and cable conduit. The BoM provided was based upon a pre-2000 valuation (mainly 1996-97). Based on the Cardno valuation work, a recommendation was made to index all BoM for Electrical assets by 2.13 to inflate them to a 2007-08 valuation. Aurecon reviewed the stated unit rates (2007-08 valuation) for a number of listed items against quoted commercial rates and found that the unit rates proposed (2007-08) were generally comparable.

The BoM (indexed 2007-08) indicates a total direct cost of \$324,000 for material components. Aurecon noted that an expenditure of \$310,000 (2013-14) and \$309,000 (2014-15) has been assigned for this task. Aurecon was not provided with a cost breakdown, but assumed it is based on the indexed BoM, project management fees, possibly a percentage for contingency costs (to cover over-runs for material cost inputs and contractor expenses), and possibly other Overheads.

Based upon a desktop review of the information provided, Aurecon considered that the proposed renewal activity is prudent in terms of timing. Aurecon also noted that SunWater has planned a study in advance to better scope the project requirements (and costs). Aurecon

considered the proposed direct expenditure, as highlighted within the BoM, as efficient, based on the comparative analysis undertaken of the unit charge rates used for key material inputs.

SKM's Review

SKM reviewed information relating to this item by accessing and viewing information recorded in SunWater's SAP-WMS to the value of \$250,000 in 2013-14 and a further \$250,000 in 2014-15.

In particular, SKM has drawn on the following renewals item specific replacement/refurbishment report produced by SunWater for this review:

Table 4.6: SKM's Reviewed Documents – Fred Haigh Dam Replacement of Cables and Cableways

<i>Document No.</i>	<i>Document Name</i>	<i>Document Title</i>	<i>Date</i>
1106063	5 -QCA Justification paper H4 – Fred Haigh Dam –Cable and Cableways	BIA-KOLA-FHD-ELEC-CBL2: Replace Cable Main Wall	21 Aug 2011

Source: SKM (2011).

(a) Prudency Review

The standard object type (asset type) allocated for this infrastructure in SAP-WMS is CALVAG – Low Voltage above ground cable.

SKM noted that SunWater has allocated a standard run to failure asset life of 35 years and a maximum condition assessment frequency of every five years. SKM considered the standard run to failure asset life to be conservative for both above and below ground LV and HV cable. For example, most electrical distribution utilities in Australia would apply an asset life of 45 to 60 years for above ground LV cable depending on whether it is operated in wet (tropical) or dry conditions respectively. SKM considered the condition assessment frequency of every five years applied to this asset type to be reasonable.

SKM viewed the WMS record for this asset and confirmed that the asset has been in service since 1975.

SKM noted that SunWater has applied its risk evaluation method to this asset and determined, during the most recent risk assessment in 2005, that it has a financial risk criterion consequence rating of minor (score 8). This, together with a probability (likelihood of occurrence) score of 3, results in an overall risk score of 24 which, under SunWater's risk assessment method, places this asset in a Low risk category. SKM viewed the WMS record for this asset and confirm that it has been allocated a Low risk rating. An overall risk category of Low should not trigger any reduction in the standard run to failure asset life of this type of asset and SKM confirmed this to be the case for this asset.

Under SunWater's systems, a business risk classification of Low does not result in a reduction in the standard run to failure asset life for that asset. Hence the risk adjusted run to failure asset life for this asset is 35 (as per the standard asset life).

The next stage of SunWater's method for determining asset replacement/refurbishment timing is by means of adjusting the risk adjusted run to failure asset life according to the variance of the condition score of the asset, at the time the last condition assessment was undertaken, with the condition that the standard asset condition decay curve predicts at that time.

SunWater has advised that, as the cable is buried, SunWater has not carried out a visual condition assessment nor has SunWater carried out any electrical test to determine if there has been degradation in the insulation. As such, there is no condition assessment contained in SAP-WMS. Whilst SKM accepted that a visual inspection cannot be easily undertaken, this should not preclude electrical testing of the cable or, in absence of that, a 'desk top' condition assessment being undertaken based on typical degradation profiles for this cable. SKM noted that SunWater uses a mix of 'Field' and 'Desktop' assessments to populate SAP-WMS.

SunWater has advised that it was decided to push this item out by a few years as the electrical system was not giving any apparent trouble and the system had not been tested.

Based on a 35-year life with no risk or condition related reduction, under SunWater's systems, the cable should have been replaced in 2009-10. SKM found the justification provided by SunWater for delaying the item beyond 2009-10 not to be convincing. All other issues aside, the lack of recent condition assessment data does not support the extension of the service life due to the absence of operational issues. Generally, SKM would not consider evidence of this nature to be sufficient to satisfy a regulatory test.

SunWater advised SKM that it has scheduled for a \$20,000 item to be undertaken in 2012-13 to carry out a full condition assessment and options analysis before undertaking any of the planned works. This options analysis is intended to determine the optimum time for replacement of the asset and each of its components.

SunWater considers that at this stage of planning, there is no obvious alternative to like-for-like replacement that would reduce costs by more than 30%.

SKM concurred with this statement and hence considered a like-for-like replacement to be prudent at this stage of the planning process. SKM assumed that, in assessing condition under this item, SunWater will conduct electrical condition tests on the cable at this time such as earth impedance testing, insulation breakdown testing rather than operational performance.

SunWater has planned for replacement of this asset based on a standard run to failure asset life for this asset type given that no condition assessment has been undertaken to date. However, given that SunWater intends to undertake a condition assessment in 2013, a major intention of which is to determine the optimum replacement date, SKM considered that it is not appropriate to plan a replacement date until that condition assessment has been completed.

Further, and as previously mentioned, SKM did not agree with the standard run to failure asset life applied by SunWater to this asset class and considered that 45 years would be a more appropriate run to failure asset life. An asset life of 45 years is in line with the asset type life adopted by power network utilities in Queensland for this asset type.

SKM did not consider that it is prudent to plan for replacement of this asset until a full condition assessment has been undertaken. Further, SKM considered that the standard run to failure asset life applied to this asset class by SunWater is less than industry norms would suggest (35 years as opposed to a minimum of 45 years).

However, even if a 45-year life is adopted, it is appropriate to plan for replacement of this renewals item within this current price setting annuity period. As such, it is prudent to include a replacement value for this price setting period.

(b) Efficiency Evaluation

For assets that are planned to be replaced five years or more hence of the planning date, SunWater uses a valuation method based on a BoM for the asset. The BoM has been developed from as built drawings and a 1996-97 value (determined from a 1996-97 valuation) attached to

each item making up the BoM based on a 1997 valuation. The 1996-97 value for each line is then escalated by a multiplier determined by Cardno in a 2008 valuation. This multiplier varies according to the component type being escalated. For example, all electrical equipment should be escalated by a 2.13 multiplier. The sum of costs is then adjusted by an indirect multiplier, in this case (1+46.359%), to take account of renewals item replacement specific factors such location, project management costs etc.

This approach (including the indirect uplift multipliers) has been audited by Arthur Anderson in 2000 and found to be robust and appropriate. Given the large portfolio of assets that SunWater is required to determine a replacement value for over a 25-year asset replacement/refurbishment cycle, SKM agreed with Arthur Anderson's conclusions and consider the approach to be appropriate.

A Planning Order has not yet been developed for this asset and SunWater has not developed a breakdown of direct and overhead costs.

SKM reviewed SunWater's calculation for determining a replacement cost and confirmed that it has instead applied the Indirect Cost multiplier contained in the BOM for this asset item in its SAP-WMS of 46.359%. Whilst this is at the upper end of the range of multipliers used by SunWater to capture asset item specific costs such as location, project management and engineering, SKM had insufficient information to determine its reasonableness.

SKM benchmarked the renewals item replacement costs proposed by SunWater as submitted to the Authority against database costs for a modern equivalent electrical asset. SKM categorised its estimates based on a modern equivalent asset unit rate database as a class 4 estimate, having an accuracy of +30%/-20%.

SKM noted that SunWater's estimate based on the process described above is \$474,308, and not \$500,000 captured in WMS SAP for the renewals item replacement total.

SKM compared its cost estimate against SunWater's cost estimate in Table 4.5 below:

Table 4.7: Fred Haigh Dam Replacement of Cables and Cableways - SunWater and SKM Cost Estimates

<i>SunWater Estimate \$2009-10</i>	<i>SKM Estimate \$2009-10</i>	<i>Variance</i>
\$500,000	512,778	-2.5%

Source: SKM 2011. Note: SunWater plans to replace this item in two stages, each stage costing \$250k (according to SAP WMS). SKM noted that SunWater's estimate based on the process described above is \$474,308, not \$500,000.

Given the total replacement valuation for the installation is shown in SAP as \$474,308, the SunWater estimate of two stages of \$250,000 is not supported by any recommended staging of asset replacement. Therefore, and whilst SKM used the combined value for the comparison and found the aggregate estimate to be reasonable, this should not be inferred as SKM finding the nominal 2-stage \$250,000 split in expenditure reasonable in itself. Such a conclusion could only be drawn based on more detailed project information.

From the SunWater analysis, it was not apparent to SKM why it is necessary to smooth the cable replacement over a two-year period, nor the justification for the total \$474,308 forecast becoming two \$250,000 stages.

However, the renewals expenditure provided to SKM by SunWater for replacement of this renewals item was within the estimating range of SKM's estimated cost for a modern equivalent

replacement asset. As such, SKM considered the SunWater proposed renewals item value of \$500,000 in total to be efficient.

(c) SKM's Summary and Conclusions

SKM did not agree with the timing of the replacement of this asset principally because SKM considers that standard asset life adopted by SunWater to be less than industry norms. However, SKM considered it prudent to include this asset's replacement value in the 30-year annuity planning period since if an industry standard 45 years asset life is applied, this asset would reach the end of its run to failure asset life by 2019-20.

From SKM's benchmarking of the replacement costs, it was satisfied that the renewals item replacement value submitted by SunWater is efficient.

Authority's Analysis

The Authority accepted Aurecon's and SKM's recommendations that the costs they reviewed are prudent and efficient.

However, the Authority noted that SKM considered that replacing the cables and cableways at Fred Haigh Dam over a two-year period has not been justified by SunWater. Further, the Authority noted that SKM considered that replacement of the asset in 2013-14 and 2014-15 had not been substantiated by SunWater in place of the end of its run to failure asset life of 2019-20.

The Authority noted that the total cost (including direct and indirect) submitted by SunWater for this renewals item (\$619,000) does not equate to the amount reviewed by SKM (\$474,308). Neither of these numbers reconcile to the total two-year amount proposed by SunWater to SKM (\$250,000 in 2013-14 and \$250,000 in 2014-15 for a total of \$500,000). This is because SKM's review was based on SunWater's SAP system, which uses a simplified method for calculating indirect and overhead costs than SunWater's financial system, which formed the basis of SunWater's NSPs and submissions to the Authority. However, where direct costs were reviewed by SKM this aligns with the direct costs submitted to the Authority.

Despite the cost discrepancy, the Authority accepted SKM's recommendation that the expenditure is prudent and efficient. The Authority therefore included SunWater's proposed costs of \$619,000 in its recommended tariffs. However, the Authority also accepted SKM's view that the expenditure be deferred to 2019-20.

Submissions Received from Stakeholders on the Draft Report

SunWater submitted that it accepted the Authority's Draft Report recommendations.

Authority's Response to Submissions Received on the Draft Report

The Authority proposes no change to its Draft Report conclusions.

Item 2: Ben Andersen Barrage – Refurbish shutters 2011-12 to 2015-16

Aurecon's review of the shutter refurbishment at Ben Andersen Barrage addressed both past renewal expenditure (see above) and future renewals expenditure.

SunWater

The shutters have been in operation since 1984. An asset life of 50 years has been assigned to this asset, indicating replacement in 2033-34 (replacement cost estimated at \$2.15 million).

At the Ben Andersen Barrage, SunWater forecasts the refurbishment of 10 shutters per year from 2011-12 to 2015-16 at a proposed budget of \$165,000 to \$173,000 per year. The total cost over the five-year period is \$861,000.

Other Stakeholders

CANEGROWERS (2011) submitted that it may be possible to replace shutters at Ben Anderson Barrage more efficiently.

Consultant's Review

Aurecon noted that there was a structured process employed in regards to this on-going expenditure at the Barrage including:

- (a) internal documentation supporting the requirements for works. Aurecon sighted a number of condition assessments undertaken between 2005-06 and 2008-09, which allocated scores of 4 for a number of shutters due to coating failure and deep rust;
- (b) Aurecon also reviewed an expert engineering report by JLR Engineering Services Pty Ltd (2008) Ben Anderson Barrage Shutter Maintenance, which examined the merits of alternative options. Aurecon suggested that this analysis re-examine the NPV analysis undertaken evaluating the merits of replacing the shutters with stainless steel. Aurecon recommended that the modelling analysis timeframe should have been extended reflecting the extended life expectancy of stainless steel. The report also highlighted that the NPV analysis was highly price-sensitive to stainless steel prices, and recommended that better quotations be sought;
- (c) research was on-going with alternative coating systems trailed in recent years to identify the optimal protective coating;
- (d) substantial internal documentation highlighting the management approval process; and
- (e) detailed financial accounts highlighting historical expenditure, and works completed.

Aurecon noted that:

- (a) the replacement of shutters was a major on-going refurbishment program with significant investment requirements;
- (b) SunWater had employed transparent and logical asset management process to date;
- (c) the removal and subsequent re-installation of refurbished shutters is undertaken by SunWater staff. The actual refurbishment work of shutters undertaken by external contractors; and
- (d) the proposed annual refurbishment program has not been fully implemented to date due to a number of drivers including reassessment of shutter conditions, and environmental conditions restricting access to the shutters.

Aurecon considered that the proposed expenditures in 2011-12 to 2015-16 are prudent and efficient, however recommends that SunWater re-examine the options study undertaken by JLR Engineering Services (2008) to expand the financial analysis undertaken, and re-examine costing (quotes) for stainless steel.

Authority's Analysis

The Authority accepts Aurecon's recommendation that the refurbishment of shutters at Ben Andersen Barrage from 2011-12 to 2015-16 is prudent and efficient.

Item 3: Ben Andersen Barrage – Replace Hydraulic Control System

Draft Report

This renewals item relates to the replacement of the hydraulic control system at Ben Andersen Barrage in 2023-24 at a cost of \$238,000.

SunWater

The Ben Andersen Barrage was constructed in 1984 and has a series of gates which are operated by a hydraulic system. The standard asset life assigned to hydraulic systems is 60 years, which would suggest a replacement date in 2043-44.

SunWater stated that although the current condition of the hydraulic system was assessed as a 2, there is a substantial ongoing problem with hydraulic oil leakage. SunWater provided Aurecon with a summary of the work maintenance orders associated with the leakage which has totalled \$85,000 since 2002-03.

In consideration of the emerging hydraulic oil leakage problems, SunWater has reassessed the asset life of these hydraulics to 40 years, bringing the replacement date forward to 2023-24.

Other Stakeholders

No other stakeholders have commented on this item.

Consultant's Review

Aurecon noted the on-going difficulties encountered at the Ben Andersen Barrage (including deterioration of the shutters), is mainly attributed to the saline water that the structure is exposed to.

Prior to replacement scheduled for 2023-24, SunWater proposes a mechanical engineering assessment (including a cost benefit analysis) to examine the feasibility of extending the life of the hydraulic system (in face of increasing maintenance costs) versus the cost of replacement.

An examination of the BoM provided by SunWater suggests that the replacement costs (direct expenses) are currently projected at \$150,000.

Based upon a desktop review of the information provided, Aurecon considered that the proposed renewal activity is prudent in terms of timing even though it suggests an earlier replacement date than that assigned by its prescribed asset life. Aurecon also noted that SunWater has planned an engineering study prior to 2023-24 that seeks to examine the feasibility of deferring replacement.

The BoM provided did not provide sufficient detail for Aurecon to evaluate the appropriateness of the assigned direct costs for this asset.

Authority's Analysis

The Authority accepted Aurecon's recommendation that the replacement of the hydraulic control system at Ben Andersen Barrage is prudent, but that insufficient information had been provided by SunWater to establish efficiency. The Authority therefore did not make any specific adjustments to this renewals item, but applied a general 10% reduction in the value of this item as insufficient information was available to establish its efficiency.

Submissions Received from Stakeholders on the Draft Report

SunWater submitted that it did not accept the Authority's Draft Report recommendation. SunWater considered that there is no evidence of systematic and endemic problems with forecasting renewals expenditure. SunWater submitted that the renewals expenditure should be included in full, rather than subject to a 10% reduction.

Authority's Response to Submissions Received on the Draft Report

Without further detailed justification of the replacement value of the screens, the Authority considers that the sufficient information to establish efficiency is still lacking. Further, after reviewing a larger sample of items since the Draft Report, and as noted in Volume 1 and further below, the Authority considers that a general cost reduction should continue to apply to non-sampled items and those items where there is insufficient information to establish prudence and efficiency. On the basis of the larger sample of items, the amount of this reduction has been revised from 10% to 20% for the Final Report.

Item 4: Ben Andersen Barrage – Anode Replacement

At the Ben Andersen Barrage, SunWater has proposed to replace the anodes at an expense of \$217,000 in 2011-12.

Other Stakeholders

No other stakeholders have commented on this item.

Consultant's Review

Aurecon noted that:

- (a) these anodes are part of the protection system for the barrage to reduce corrosion and extend the life of the asset. They are deployed underground on the right hand side bank;
- (b) the current anodes were installed in the mid-1980s. The operational life prescribed by the manufacturer of the anodes is 10 years;
- (c) an external expert report by JLR Engineering Services (2008) recommended the replacement of the anodes; and
- (d) the asset management register has incorporated the replacement of the anodes every 10 years from 2011-12.

Aurecon made the following key points:

- (a) the replacement of the anodes comes at a significant cost every 10 years. The manufacturers suggest that the operational life is only 10 years; and

- (b) testing the operation of the galvanic protections system is relatively simple, and should be carried out on a routine basis. Further, the anodes have well exceeded their expected life. This can mean that either SunWater has not routinely tested the operation of the protections system or has not been responsive to any issues identified, or simply that the life of the anodes is much greater than the expected 10 years. Either way, Aurecon suggests that it indicates that the management or operational strategy for these needs further consideration.

Based on the information reviewed and site inspection, Aurecon considered that the proposed expenditure in 2011-12 is prudent and efficient. Aurecon noted that this expense is now projected at 10-year intervals based on the manufacturer's recommendation. Aurecon recommended that condition assessments at the Barrage incorporate testing of the galvanic protections systems to allow an extended operational life beyond the projected 10 years.

Authority's Analysis

The Authority accepts Aurecon's recommendation that the replacement of anodes at Ben Andersen Barrage is prudent and efficient.

Item 5: Bucca Weir – Refurbishment of Trash Racks and Guides

Draft Report

SunWater

SunWater's renewals database includes \$72,000 for the refurbishment of Trash Racks and Guides in 2012-13, allocated to the Bundaberg Distribution WSS.

Other Stakeholders

BRIG (2011c) and irrigators during the second round of consultations queried whether Bucca Weir is a bulk or distribution asset.

Consultant's Review

Aurecon noted that a renewal expenditure has been assigned to Bucca Weir within the NSP. Bucca Weir is a listed asset of the Bundaberg Bulk WSS. Aurecon noted that the proposed renewal expenditure relates to \$72,000 in 2012-13, for the refurbishment of Trash Racks and Guides. Aurecon questioned if the actual expense relates to the Weir itself, or supporting channel/infrastructure directly related to the Distribution network.

Aurecon did not provide a recommendation on the prudence and efficiency of this expenditure.

Authority's Analysis

The Authority noted that the ROP for Bundaberg WSS and the letter from Minister Robertson, dated 28 September 2010, confirms that Bucca Weir is a bulk asset. In the absence of a recommendation from Aurecon regarding the prudence and efficiency of this item, the Authority did not make any specific adjustments to this item, but applied a general 10% reduction in the value of this item as insufficient information was available to establish its efficiency. The Authority also transferred it from the distribution system to the bulk scheme.

Submissions Received from Stakeholders on the Draft Report

SunWater accepted that this renewals item should be transferred to the Bundaberg WSS. SunWater submitted that the 10% efficiency reduction should not apply to this item, as it was found to be prudent and efficient.

Authority's Response to Submissions Received on the Draft Report

The Authority did not (as SunWater asserted) find this item to be prudent and efficient in its Draft Report.

After reviewing a larger sample of items since the Draft Report, and as noted in Volume 1 and further below, the Authority considers that a general cost reduction should continue to apply to non-sampled items and those items where there is insufficient information to establish prudence and efficiency. On the basis of the large sample of items, the amount of this reduction has been revised from 10% to 20% for the Final Report.

Conclusion

Draft Report

In summary, five items for the Bundaberg WSS were sampled. Of these:

- (a) two items are prudent and efficient and have been retained as forecast expenditure;
- (b) one item is prudent but insufficient information has been provided by SunWater to establish efficiency; and
- (c) one item is prudent but not efficient, required adjustment to forecast expenditure; and
- (d) one item was transferred to the Bundaberg WSS from the Bundaberg Distribution WSS.

Further, as noted in Volume 1, after a consideration of all its consultants' reviews, the Authority recommended that a 10% saving be applied to all non-sampled and sampled items for which there was insufficient information.

Final Report

The Authority has not changed its findings on the prudence and efficiency of sampled forecast renewals expenditure items in the Bundaberg WSS since the Draft Report.

As outlined in Volume 1, the Authority undertook further sampling of forecast renewals expenditures across SunWater's schemes. For the Final Report, the Authority recommended that a 20% saving be applied to the direct costs of all non-sampled and sampled items for which there was insufficient information.

In total, the Authority recommends the direct renewals expenditure be adjusted as shown in Table 4.8.

Table 4.8: Review of Forecast (Direct) Renewals Expenditure 2011-36 (Real \$'000)

<i>Item</i>	<i>Year</i>	<i>SunWater (\$'000)</i>	<i>Authority's Draft Report Findings</i>	<i>Draft Recommended (\$'000)</i>	<i>Authority's Final Report Findings</i>	<i>Final Recommended (\$'000)</i>
Sampled Items						
1. Fred Haigh Dam - Replacement of Cables and Cableways	2013-14 to 2014-15	619	Prudent and efficient, but deferred to 2020	619	Prudent and efficient, but deferred to 2020	619
2. Ben Andersen Barrage – Refurbish shutters	2011-12 to 2015-16	861	Prudent and efficient	861	Prudent and efficient	861
3. Ben Andersen Barrage – Replace Hydraulic Control System	2023-24	238	Insufficient information	10% saving applied	Insufficient information	20% saving applied
4. Ben Andersen Barrage – Anode Replacement	2011-12	217	Prudent and efficient	217	Prudent and efficient	217
5. Bucca Weir – Refurbishment of Trash Racks and Guides	2012-13	0	Transferred from the Bundaberg Distribution WSS	10% saving applied	Transferred from the Bundaberg Distribution WSS	20% saving applied
Non-Sampled Items				10% saving applied		20% saving applied

Source: SunWater (2011), Aurecon (2011), SKM (2011) and QCA (2011).

4.6 SunWater's Consultation with Customers

Draft Report

Submissions

SunWater (2011b) submitted that through Irrigator Advisory Committees (IACs), customers are:

- (a) able to offer suggestions on planned asset maintenance which are considered by SunWater in the context of asset management planning;
- (b) consulted on various operational and other aspects of service provision, including the timing of shutdowns and managing supply interruptions; and
- (c) provided with information about renewals expenditure, particularly where supply interruptions may result.

Nonetheless, SunWater noted opportunities for greater consultation with irrigators do exist.

BRIG (2010) submitted that customers are not consulted on asset management plans and the renewal annuity expenditure or revenue. BRIG submitted that the transparency and irrigator input into the renewal annuity should be increased.

ISIS Sugar Partnership (2010) submitted that a formal customer engagement process to plan future assets should be established.

CANEGOWERS ISIS (2011) stated that SunWater's consultation with irrigators is terrible. The current Bundaberg WSS IAC cannot discuss and is not engaged in matters outside local operations and maintenance issues.

CANEGOWERS ISIS (2011) stated that the Authority should recommend that SunWater engage with customers on a more regular basis on broader issues.

BRIG (2010) stated that there was insufficient time for customers to examine the service standard/price relationship during the previous water pricing negotiations and there was an undertaking and an expectation that this would be considered in the next available process.

CANEGROWERS (2011) submitted that there has been a reduction in service standards in recent years, without customer approval. CANEGROWERS question the purpose of setting service standards if there is no penalty for non-compliance.

Authority's Analysis

In the Draft Report, the Authority noted customers' concerns about the lack of involvement in the planning of future renewals expenditure.

In the context of the Draft Report, the Authority recommended that there be a legislative requirement for SunWater to consult with its customers about any changes to its service standards and proposed renewals expenditure program. SunWater should also be required to submit the service standards and renewals expenditure program to irrigators for comment whenever they are amended and that irrigators' comments be documented and published on SunWater's website and provided to the Authority.

Submissions Received from Stakeholders on the Draft Report

In response to the Draft Report, irrigators during the round 3 consultation submitted that SunWater's information system should be set up to allow for information to be assessed and reviewed in the future. Irrigators considered that standards of service needed to be reviewed.

CANEGROWERS Isis (2011a) submitted that SunWater had a large over-budget spend on renewals items without consultation with customers. CANEGROWERS Isis submitted that more consultation on renewals expenditure, asset management planning and scheme management is required. A more optimised approach to future renewal spends is required to ensure the renewal does not exceed the scheme/system requirements and therefore exceed the customers ability to pay for the service.

SunWater (2011as) submitted that the nature and extent of stakeholder consultation is ultimately a matter for SunWater and its customers. SunWater submitted that costs would be involved in implementing the Authority's recommendations and that the Authority had failed to establish that the benefits outweighed the costs.

SunWater considers that although it is crucial that SunWater retains ultimate control over decisions regarding renewals expenditure, opportunities to improve information provided to customers that does not involve legislative amendment do exist.

Authority's Response to Submissions Received on the Draft Report

The Authority shares irrigators' concerns regarding the availability of information from SunWater and expects SunWater's readiness for subsequent pricing investigations to improve.

In response to SunWater's concerns that excessive costs will be incurred undertaking consultation, the Authority considers that SunWater's estimated cost is modest compared to total renewals spend, as noted previously. The benefits of greater consultation are likely to outweigh the costs, as noted in Volume 1.

In addition, the Authority agrees that SunWater maintain ultimate control over its renewals annuity program. However, the Authority agrees with CANEGROWERS Isis's comment that that customer consultation has not been adequate under current legislation (despite explicit recommendations of the past price review) and, as a consequence, SunWater should be more formally obliged to undertake consultation.

4.7 Allocation of Headworks Renewals Costs According to WAE Priority

Previous Review

For the 2006-11 price path, the renewals costs for the Bundaberg bulk water infrastructure were apportioned between priority groups using converted nominal water allocations. The conversion to medium priority WAEs was determined by WPCF of 1.7:1, that is, one ML of high priority WAE was considered equivalent to 1.7 ML of medium priority WAE.

Stakeholder Submissions

SunWater

For the 2012-17 regulatory period, SunWater proposed that renewals costs for bulk water infrastructure be apportioned in accordance with the share of utilisable storage headworks volumetric capacity dedicated to that priority group – as measured by the headworks utilisation factor (HUF).

SunWater submitted that, in general, the HUF allocates a greater proportion of capital costs per ML to high priority WAEs. Specifically, the HUF methodology takes into account water sharing rules, Continuous Water Sharing Arrangements (CWSAs) and other operational requirements that typically give high priority entitlement holders exclusive access to water stored in the lower levels of storage infrastructure.

SunWater (2010d) submitted a detailed outline of the HUFs methodology, outlining its derivation and application for each scheme. This methodology, discussed in detail Volume 1, can be summarised as follows.

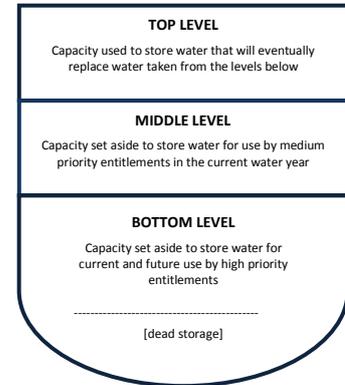
Step 1: Identify the water entitlement groupings for each scheme, as listed in DERM's Water Entitlement Register, and establish which groups are to be considered as high priority and medium priority for the purposes of the HUFs calculation².

² If more than two priority groups exist, water sharing rules and other differentiating characteristics are taken into account to determine whether they are included in the high or medium priority grouping, or neither.

Step 2: Determine the volumes associated with the high and medium priority groupings identified in Step 1, taking into account any allowable conversion from medium to high priority under the scheme's ROP.

Step 3: Determine the extent to which water sharing rules, CWSAs and other operational requirements give the different water entitlement priority groups exclusive or shared access to capacity components of the storage infrastructure.

This step divides the storage infrastructure into three levels: the bottom layer, which is exclusively reserved for high priority; the middle layer, which is effectively reserved for medium priority; and the top layer, which is shared between the medium and high priority groups.



Step 4: Assess the hydrological performance in 15-year sequences of each layer identified in Step 3 to determine the probability of each component of headworks storage being accessible to the relevant priority group.

Step 5: Calculate the percentage of storage headworks capacity to which medium priority users have access for each of the 15-year sequences analysed in **Step 4:**

$$\frac{MP \text{ Utilised Capacity}}{\text{Total Utilised Capacity}} = \frac{MP_{1(\text{utilised})} + MP_{2(\text{utilised})}}{MP_{1(\text{utilised})} + HP_{1(\text{utilised})} + MP_{2(\text{utilised})} + HP_{2(\text{utilised})}} (\%)$$

Set the HUF_{mp} equal to the minimum of these values to reflect the worst 15-year period ($HUF_{hp} = 1 - HUF_{mp}$).

If more than two types of water entitlements were aggregated in Step 1 these are then disaggregated.

The parameters used for determining the HUFs for the Bundaberg WSS are summarised in Table 4.9. They reflect revisions to nominal WAE volumes, as submitted by SunWater in Addendum Part 1 – Erratum: Errors found in HUF Input Data (SunWater, 2011x). The HUFs for this scheme are 82% for medium priority and 18% for high priority.

Table 4.9: Application of HUFs Methodology

STEP 1: Water Entitlement Groups (DERM's Water Allocation Register)			
<i>Nominal Group</i>	<i>(ML)</i>	<i>HUF Group</i>	<i>(ML)</i>
Medium Priority (SunWater)	211,957	MP _A	335,957
Medium Priority (Burnett Water)	124,000		
High Priority (SunWater)	24,372	HP _A	44,372
High Priority (Burnett Water)	20,000		
STEP 2: ROP Conversion Factor Adjustment			
Conversion Factor: ROP _{CF}			N/A
Maximum volume that can be converted to HP: HP _A max			44,372
Corresponding volume of MP: MP _A min = MP _A - (HP _A max - HP _A) * ROP _{CF}			335,957
STEP 3: Water Sharing Rules & Operational Requirements			
<i>Water Sharing Rules</i>			
Volume below which MP not available: MP ₀ AA			65,138 ³ ; 69,165 ⁴
Volume above which max. MP available: MP ₁₀₀ AA			637,363
<i>CWSAs and other operational requirements</i>			
Likely increase in volume effectively reserved for HP: MP ₀			134,303
Likely increase in min. storage before maximum MP available: MP ₁₀₀			688,221
<i>Key Dam Level Measures</i>			
Full Supply Level: FSV _{hwks}			937,420
Dead Storage Level: DSL _{hwks}			29,590
STEP 4: Hydrologic performance of headworks storage			
<i>Storage Layer</i>	<i>Storage Capacity (ML)</i>	<i>Prob. of Utilisation</i>	<i>Utilised Capacity (ML)</i>
Top: max{(FSV _{hwks} - MP ₁₀₀), 0}*	MP ₂ = 220,126; HP ₂ = 29,073	18%	MP _{2u} = 40,294; HP _{2u} = 5322
Middle: min{(MP ₁₀₀ - MP ₀), (FSV _{hwks} - MP ₀)}	MP ₁ = 553,918	74%	MP _{1u} = 408,557
Bottom: MP ₀ - DSV _{hwks}	HP ₁ = 104,713	100%	HP _{1u} = 104,737
STEP 5: Calculation of HUFs for each Water Entitlement Group			
<i>Formula</i>	<i>HUF Group</i>	<i>Nominal Group</i>	
MP _A : (MP _{1u} + MP _{2u}) / (MP _{1u} + HP _{1u} + MP _{2u} + HP _{2u}) = (408,557 + 40,294) / (408,557 + 104,737 + 40,294 + 5322)	HUF _{mp} = 80%	Medium Priority (SunWater) = 82% Medium Priority (Burnett Water) = 77%	
HP _A : (HP _{1u} + HP _{2u}) / (MP _{1u} + HP _{1u} + MP _{2u} + HP _{2u}) = (104,737 + 5322) / (408,557 + 104,737 + 40,294 + 5322)	HUF _{hp} = 20%	High Priority (SunWater) = 18% High Priority (Burnett Water) = 23%	

³ Refers to MP₀AA for Kolan sub-scheme;⁴ Refers to MP₀AA for Burnett sub-scheme

*Apportioned between MP_2 and HP_2 using the ratio $MP_1:HP_1$. Source: SunWater (2010d, 2011x).

Other Stakeholders

BRIG (2011) submitted that:

- (a) medium priority and high priority users should not pay the same cost per ML as more of the dam is required to supply high priority;
- (b) HUF is not appropriate when there is no longer a return on assets and that renewals costs are heavily back-loaded without an explanation;
- (c) while the conversion factor for medium priority to high priority calculated by DERM maintains the reliability of medium priority water, the impact of medium priority users of such conversions at very low storage levels is very severe – from a small announced allocation to zero;
- (d) the pricing structure should not encourage the conversion of medium priority to high priority. In other words, the cost of holding extra medium priority to ensure a reasonably reliable supply should be less than the cost of a lesser quantity of high priority water; and
- (e) the HUF approach proposed by SunWater for allocation of asset renewal costs to medium priority and high priority underestimates the proportion of the asset devoted to supplying high priority bulk water. BRIG proposes that the conversion factors in the Water Resource Plan be adopted.

CANEGOWERS (2011) questioned the conversion factor and HUF for this scheme and questioned that if 90% of WAEs are medium priority, then why is the converted nominal allocation for medium priority 84%? CANEGOWERS (2011) stated that this indicates a conversion factor of around 1.7, which is very low for this scheme; especially as the current ROP rules give extremely high reliability for high priority especially towards the end of a water year.

CANEGROWERS (2011) submitted that the 82% HUF indicated that the driest 15 years for Bundaberg were very close to the average. They noted that this did not match the very dry conditions experienced in the past few decades.

CANEGROWERS (2011) submitted that the cost allocation methodology needs to reflect that some irrigators are likely to convert from medium priority to high priority. Conversion factors should be calculated by converting all medium priority to high priority and use this so there is no incentive or cost impacts on remaining irrigators if some irrigators do decide to convert.

ISIS Sugar Partnership (2010) submitted costs should be allocated depending on reliability of supply.

During the second round of consultations (April 2011), irrigators expressed concern regarding conversion factors since some growers are likely to convert from medium to high priority over the next five years. Irrigators considered that this will cause remaining medium priority users to be imposed with extra costs. Conversion factors should be calculated by converting all medium priority to high priority and use this for both bulk and channel so there is no incentive or cost impacts on remaining growers if some growers decide to convert.

Authority's Analysis

The Authority commissioned Gilbert & Sutherland (G&S) to conduct an independent review of SunWater's proposed HUFs methodology. G&S (2011) concluded that the input data and

model sources were appropriate, calculations were accurate to the method and input data utilised, the methodology exhibits rigour and is generally robust in providing consistent outcomes. G&S also recommended some amendments to SunWater's approach.

As discussed in Volume 1, the Authority endorsed SunWater's proposed approach for the allocation of capital costs, subject to the following amendment proposed by G&S (2011) that the method for apportioning the top layer of storage between medium and high priority be modified to reflect the ratio of nominal volumes rather than ratio of $MP_1:HP_1$.

SunWater (2011x) accepted these recommendations and submitted recalculated HUFs for each scheme. For the Bundaberg WSS, these recommendations did not result in any changes to the HUF (Table 4.10).

Table 4.10: Revised HUF Calculations

STEP 4: Hydrologic performance of headworks storage			
<i>Storage Layer</i>	<i>Storage Capacity (ML)</i>	<i>Prob. of Utilisation</i>	<i>Utilised Capacity (ML)</i>
Top layer			
<i>Initial</i>	$MP_2 = 220,126; HP_2 = 29,073$	18%	$MP_{2u} = 40,294; HP_{2u} = 5322$
<i>Revised*</i>	$MP_2 = 220,126; HP_2 = 29,073$	no change	$MP_{2u} = 40,294; HP_{2u} = 5322$
Middle Layer	$MP_1 = 553,918$	74%	$MP_{1u} = 408,557$
Bottom Layer	$HP_1 = 104,713$	100%	$HP_{1u} = 104,737$
STEP 5: Calculation of HUFs for each Water Entitlement Group			
	<i>Initial</i>	<i>Revised</i>	<i>Nominal Group</i>
HUF_{mp}	80%	80%	Medium Priority (SunWater) = 82% Medium Priority (Burnett Water) = 77%
HUF_{hp}	20%	20%	High Priority (SunWater) = 18% High Priority (Burnett Water) = 23%

*Apportioned between MP_2 and HP_2 using the ratio of nominal volumes ($MP_A:HP_A$). Source: SunWater (2011x).

The Authority estimates that based on the HUF methodology, the conversion for medium priority to high priority would be 1.91:1. This compares with the WPCF of 1.7:1 used for 2006-11 price paths. Further, the Authority notes that under the HUF approach, medium priority irrigators (served by SunWater) will now pay 82% of the cost of renewals whereas previously medium priority irrigators (served by SunWater) paid 84%.

In response to issues raised:

- in regard to BRIG's comments, the HUF provides a cost reflective approach to allocating storage costs that provides greater recognition of the requirements of High Priority users. It would mean that high priority users are allocated a greater share of these costs, as compared to that applying in the Water Resource Plan (WRP);
- in regard to CANEGROWERS comments, the Authority notes that the HUF is equivalent to a 1.91:1 conversion factor, different to the 1.7:1 that previously applied. The HUF methodology takes into account drought expectations over time. The conversion factors remain appropriate where trading occurs between high and medium priority, as shown in the WRP. The HUF is used to allocated storage related renewals costs;

- (c) in regard to Isis Sugar Partnerships (2011), the Authority notes that the HUF methodology does take into account the reliability of supply; and
- (d) in regard to Round 2 comments, converted allocations to high priority would attract a greater proportion of storage related costs.

4.8 Calculating the Renewals Annuity

Draft Report

In Volume 1, the Authority recommended an indexed rolling annuity, calculated for each year of the 2012-17 regulatory period.

For the Bundaberg WSS, the draft recommended renewals annuity for the 2012-17 regulatory period was identified in Table 4.11.

The table showed the total renewals annuity recommended by the Authority and the component amounts for high and medium priority customers. Also presented for comparison were SunWater's total renewals annuity for 2006-11 and SunWater's proposed total annuity for 2012-16. SunWater did not submit a disaggregation between high and medium priority customers.

Final Report

For the Final Report, changes to the Authority's recommended forecast renewals annuity arise due to revised assessment of specific renewals items for which new information was provided. The changes included

- (a) a change in the 1 July 2006 opening ARR balance from the use of actual renewals data. The 2006 opening balance is lower (now negative) than in the Draft Report;
- (b) the application of a 4% saving to non-sampled items and sampled items for which there was insufficient information, rather than 10% in the Draft Report;
- (c) removal of the previously included flood damage repair costs for 2010-11 and inclusion of two new items (including Intersafe previously erroneously adjusted by 10%) that were assessed as prudent and efficient; and
- (d) application of a 20% saving to non-sampled items and sampled forecast renewals items for which there was insufficient information (instead of 10% in the Draft Report).

The revised renewals annuities recommended by the Authority are provided in Table 4.11 for comparison with the Draft Report estimates. The combined effects of the above changes did not result in a substantial change to the renewals annuities.

Table 4.11: Bundaberg WSS Renewals Annuity (Real \$'000)

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Draft Report											
Total SunWater	99	397	421	456	668	640	641	640	638	637	637
Total Authority	-	-	-	-	-	-	544	544	543	545	553
High Priority	-	-	-	-	-	-	76	76	76	77	78
Medium Priority	-	-	-	-	-	-	372	372	371	373	378
Distribution Losses	-	-	-	-	-	-	96	96	95	96	97
Final Report											
Total Authority	-	-	-	-	-	-	545	544	541	542	548
High Priority	-	-	-	-	-	-	33	33	33	33	33
Medium Priority	-	-	-	-	-	-	394	393	391	392	396
Distribution Losses							118	118	117	117	119

Note: Includes indirect and overhead costs relating to renewals expenditure, which is discussed in Chapter 5. SunWater's renewals annuity does not include the allocation of Gin Gin channel costs to the bulk system (see Chapter 3). The Authority's renewals annuity does include the adjustment. Source: Actuals (SunWater, 2011) and Recommended (QCA, 2011).

5. OPERATING COSTS

5.1 Background

Ministerial Direction

The Ministerial Direction requires the Authority to recommend a revenue stream that allows SunWater to recover efficient operational, maintenance and administrative (that is, indirect and overhead) costs to ensure the continuing delivery of water services.

Issues

To determine SunWater's allowable operating costs for 2012-17, the Authority considered the following:

- (a) the scope of operating activities for this scheme;
- (b) the extent to which previously anticipated cost savings (identified prior to the 2006-11 price paths) have been incorporated into SunWater's total cost estimates for the purpose of 2012-17 prices;
- (c) the prudence and efficiency of SunWater's proposed operating expenditures including direct and non-direct costs and escalation factors; and
- (d) the most appropriate methodologies for assigning operating costs to service contracts⁵ and to different priority customer groups (within each service contract).

5.2 Total Operating Costs

Operating costs are generally classified by SunWater as either non-direct or direct.

Non-direct costs are classified as either:

- (a) overhead costs – allocated to all of SunWater's 62 service contracts for services that support the whole business (for example, Board, CEO and human resource management costs); and
- (b) indirect costs – allocated to more than one service contract (but not all service contracts) for specialised services pertaining to a particular type of asset or group of service contracts (for example, asset management strategy and systems).

Direct costs are those readily attributable to a service contract (for example, labour and materials employed directly to service a scheme asset) and have been classified as operations, preventive maintenance (PM), corrective maintenance (CM), electricity and other costs.

In its NSP, SunWater described the scope of its operating activities for this scheme to include service provision, compliance, insurance, recreation and other supporting activities (these were not classified by direct and indirect costs). SunWater noted that:

- (a) a Service Manager and 41 staff are located at the Bundaberg depot and are responsible for the day-to-day water supply management and for delivery of the programmed works for all users in the region;

⁵ SunWater refers to each bulk scheme and each distribution system as a service contract. Consequently, SunWater has 22 irrigation bulk service contracts and eight irrigation distribution system service contracts.

- (b) service provision relates to:
- (i) water delivery – scheduling and releasing bulk water from storages, surveillance of water levels and flows in the river, and quarterly meter reading; and
 - (ii) customer service and account management – managing enquiries about accounts and major transactions; providing up to date online data on WAE, water balances and water usage; and managing transactions such as temporary trades, transfers and other scheme specific transactions;
- (c) compliance requirements to provide the bulk service include those relating to:
- (i) the ROP and ROL – a major part of which is gathering and reporting data at quarterly and annual intervals on water sharing rules, ROP amendments and modifications; water accounting and reporting on stream flow, water quality and other data (Table 5.1 refers).

Table 5.1: DERM’s Water Quality Monitoring Requirements of SunWater

<i>Storage</i>	<i>Monthly monitoring requirements</i>			
	<i>Inflow</i>	<i>Head Water</i>	<i>Tail Water</i>	<i>BGA</i>
Fred Haigh Dam	Yes	Yes	Yes	Yes
Bucca Weir	Yes	No	Yes	Yes
Kolan Barrage	No	Yes	No	No
Ned Churchward Weir	No	Yes	Yes	Yes
Ben Anderson Barrage	No	Yes	Yes	Yes
Sheep Station and St Agnes Creeks	Yes	Yes	No	No

Note: Includes sampling for the following variables: Dissolved oxygen, electrical conductivity, pH, temperature; total nitrogen, phosphorus and BGA. Source: SunWater (2011).

- (ii) dam safety – as Fred Haigh Dam is a referable dam under the *Water Act 2000*, SunWater is required to have a program in place to minimise the risk of dam failure, which involves documenting, recording and reporting on dam safety. Audits and thorough inspections are carried out annually.

Routine dam safety inspections are carried out monthly on Fred Haigh Dam and quarterly on the weirs and barrages. Specific dam safety inspections are at the dam, which include monitoring of embankments, piezometers, seepage and the general condition of the storages as defined in the dam surveillance specification. They also include condition inspections to identify and plan maintenance requirements and to provide information for management planning of water delivery assets;

- (iii) environmental management to comply with the ROP and *Environmental Protection Act 1994* which require SunWater to deal with risks such as fish deaths, chemical usage, pollution, contaminants and approvals for instream works;

- (iv) land management (weed and pest control, rates and land tax, security and trespass and access to land owned by SunWater) as well as other obligations in relation to workplace health and safety, financial reporting and taxation and irrigation pricing;
- (d) insurance is obtained on a portfolio basis and allocated to the scheme;
- (e) SunWater has sought to transfer the management and cost of recreation activities to private operators or Government. The recreation facilities at Fred Haigh Dam are managed by the Bundaberg Regional Council; and
- (f) other supporting activities include central procurement, human resources and legal services.

Previous Review

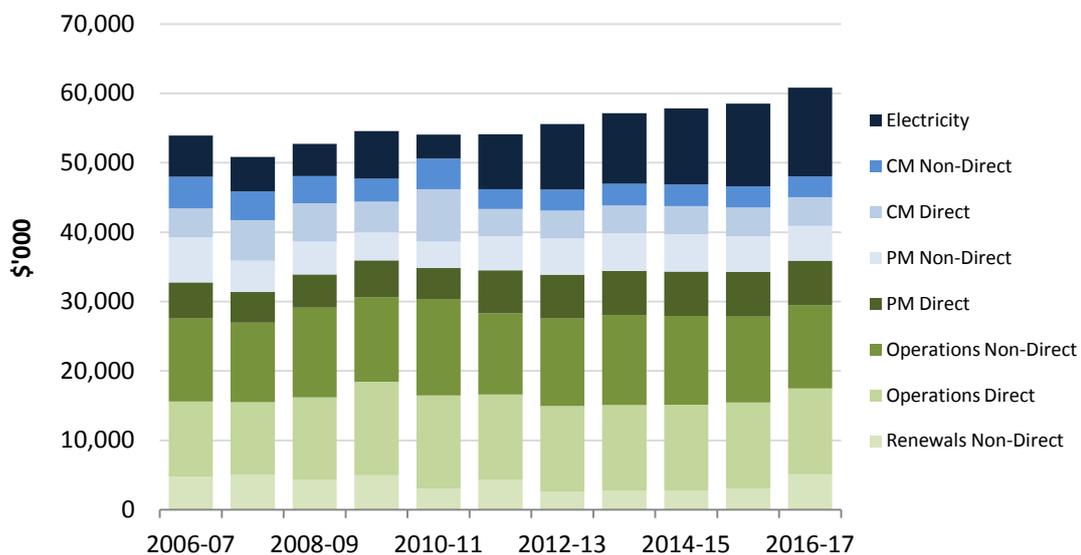
For the 2006-11 price paths, Indec identified annual cost savings of between \$3.8 million and \$5.5 million (2010-11 dollars) or 7.5% to 9.9% of total annual costs, which SunWater was to achieve during the 2006-11 price paths (SunWater, 2006a). See Volume 1.

Stakeholder Submissions

SunWater

SunWater's past and forecast total operating costs for its irrigation service contracts (all sectors) are summarised in Figure 5.1 below. SunWater's allocation of non-direct costs to activities (including renewals) is also identified. These estimates reflect SunWater's most recent information (including that received by the Authority in October 2011) and differ from SunWater's NSP.

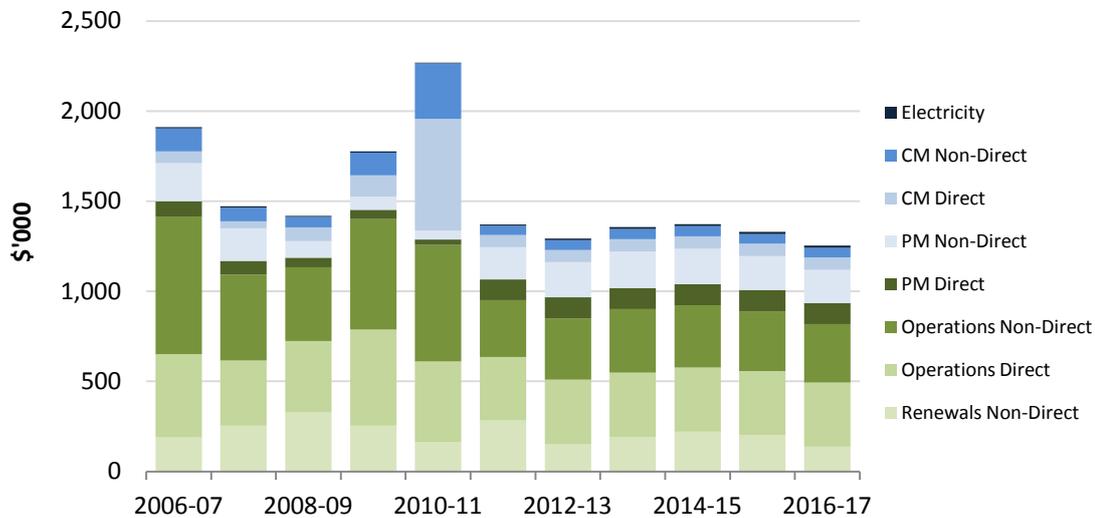
Figure 5.1: SunWater's Total Operating Costs (Real \$'000) – All Service Contracts



Note: Renewals direct costs are discussed in the previous chapter. Renewals non-direct costs are the non-direct operating costs allocated to renewals. Totals vary from NSP due to the inclusion of renewals non-direct costs, SunWater's revised approach to insurance and electricity, exclusion of revenue offset (which is dealt with in the following chapter) and rounding. The estimates also reflect the most recent information provided by SunWater to the Authority in October 2011. Source: SunWater (2011ap) and SunWater (2011ao).

Expenditure by activity in Bundaberg WSS (all sectors) is shown in Figure 5.2 and Tables 5.2 and 5.3.⁶

Figure 5.2: SunWater's Total Operating Costs – Bundaberg WSS (Real \$'000)



Note: Renewals direct costs are discussed in the previous chapter. Renewals non-direct costs are the non-direct operating costs allocated to renewals. Totals vary from NSP due to the inclusion of renewals non-direct costs, SunWater's revised approach to insurance and electricity, exclusion of revenue offset (which is dealt with in the following chapter) and rounding. The estimates also reflect the most recent information provided by SunWater to the Authority in October 2011. Source: SunWater (2011ap) and SunWater (2011ao).

Table 5.2: Expenditure by Activity (Real \$'000)

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Operations	1,227	838	807	1,147	1,092	668	697	710	702	688	680
Electricity	7	7	7	7	5	8	10	10	11	12	13
Preventive Maintenance	296	256	144	124	80	295	312	319	314	306	302
Corrective Maintenance	192	116	134	243	928	117	122	125	124	122	121
Renewals Non-Direct	188	255	327	255	165	282	154	192	221	202	137
Total	1,910	1,472	1,419	1,776	2,270	1,371	1,294	1,356	1,372	1,330	1,254

Note: Renewals direct costs are discussed in the previous chapter. Renewals non-direct costs are the non-direct operating costs allocated to renewals. Totals vary from NSP due to the inclusion of renewals non-direct costs, SunWater's revised approach to insurance and electricity exclusion of revenue offset (which is dealt with in the following chapter) and rounding. The estimates also reflect the most recent information provided by SunWater to the Authority in October 2011. Source: SunWater (2011ap).

⁶ SunWater's operating costs for the Bundaberg WSS in this chapter do not include the adjustment for Gin Gin Channel (see Chapter 3). This adjustment is included in Chapter 6 – Draft Prices.

Table 5.3: Expenditure by Type (Real \$'000)

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Labour	352	249	213	410	426	292	296	296	296	296	296
Electricity	7	7	7	7	5	8	10	10	11	12	13
Contractors	43	40	93	59	430	49	50	51	52	52	52
Materials	51	24	33	41	87	39	40	40	41	42	42
Other	167	162	185	192	154	154	154	154	154	153	153
Non-Direct	1,290	990	888	1,067	1,168	829	745	805	819	776	698
Total	1,910	1,472	1,419	1,776	2,270	1,371	1,294	1,356	1,372	1,330	1,254

Note: Renewals direct costs are discussed in the previous chapter. Non-direct costs include the non-direct operating costs allocated to renewals. Totals vary from NSP due to the inclusion of renewals non-direct costs, SunWater's revised approach to insurance and electricity, exclusion of revenue offset (which is dealt with in the following chapter), and rounding. The estimates also reflect the most recent information provided by SunWater to the Authority in October 2011. Source: SunWater (2011ap).

In its NSP, SunWater submitted that the operating costs for this scheme averaged \$1.3 million per year over the period of the current price path. [Operating costs as defined in the NSP exclude the indirect and overhead costs allocated to renewals expenditure.] The projected efficient average operating costs in the NSP for 2011-16 are \$1.1 million per annum.

Other Stakeholders

BRIG (2011) questioned how operating costs are going to decrease substantially in 2010-11 when they are supposedly efficient now.

CANEGROWERS (2011) also noted that 53% of operating costs are overheads.

During the first round of consultations (May 2010) irrigators wanted to ensure that SunWater's costs are based on efficient costs.

Authority's Analysis

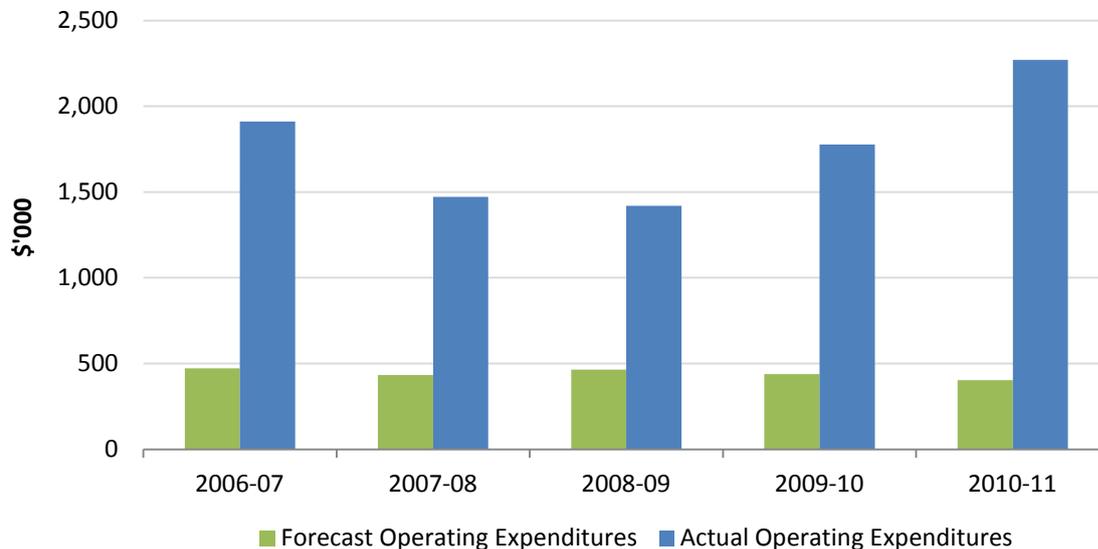
The Authority has sought to review the extent to which previously anticipated cost savings (identified prior to the 2006-11 price paths) have been incorporated into SunWater's total cost estimates for the purpose of 2012-17 prices.

In Volume 1, the Authority noted that during the beginning of the 2006-11 price paths, SunWater's total operating costs increased above those previously forecast. In response, in July 2009 SunWater instigated a program to reduce costs by \$10 million (the Smarter Lighter Faster Initiative (SLFI)). SunWater submitted that these savings should be fully realised by 30 June 2012.

In 2011, the Authority engaged Indec to assess whether SunWater achieved the cost savings forecast in 2005-06. A comparison of forecast and actual operating costs for the Bundaberg WSS is shown in Figure 5.3 below. For this scheme, SunWater's actual operating costs were greater than Indec's forecast efficient operating costs by \$6,636,000 over the period.

Indec noted that anomalies could arise for the service contracts from linked bulk and distribution systems and the solution was to combine them into bundled schemes. See Volume 1.

Figure 5.3: Forecast and Actual SunWater Operating Expenditure 2006-11 (Real \$'000)



Source: SunWater (2011ap) and Indec (2011f)

Indec has not, however, inferred from its analysis that SunWater should alter its costs over the 2012-17 regulatory period to the level of efficient costs determined for 2010-11. It observed that further analysis would be required to justify and support such an inference (see Volume 1). The Authority engaged Aurecon to address potential Bundaberg WSS specific cost savings (see below).

5.3 Non-Direct Costs

Introduction

Since structural reforms were implemented, SunWater has become a more centrally organised business. SunWater's strategic operational management (for example, Finance, Strategy and Stakeholder Relationships) is provided centrally. This arrangement seeks to ensure that appropriate systems and processes are in place, are being applied in a consistent manner, are addressing key regulatory compliance and business requirements; and to ensure a high degree of flexibility across SunWater's workforce.

Some specialist operations staff with expertise in key operational areas may be located either in Brisbane or regional locations. Their specialist expertise is applied to technical problems and issues in support of local operators.

Operational works planning and maintenance scheduling is provided by regional management, although all staff positions and budgets are managed centrally. For example, spare capacity in one region will be diverted (and billed) to regions with higher demand. Similarly, staff may be assigned to either irrigation or non-irrigation service contracts.

The nature of these non-direct activities, as either indirect or overhead costs, is detailed in Volume 1.

Previous Review

As noted above, in the previous review, Indec reviewed SunWater's non-direct costs for 2006-11.

Non-direct costs were allocated to schemes on the basis of total direct costs.

*Draft Report*Stakeholder Submissions

SunWater

As noted in Volume 1, SunWater submitted that it will incur \$23.5 million in total non-direct costs in 2012-13 (Table 5.4). SunWater's approach to the forecasting of non-direct operating expenditures is detailed in Volume 1.

In brief, SunWater forecast non-direct costs for 2010-11 and then escalated these forward using indices applied to the components of these costs. The costs in 2010-11 were based on actual costs over the past four years (excluding spurious costs) and adjustments for known or expected changes in costs. In particular, SunWater proposed that salaries and wage costs generally will rise by 4% per annum. However, SunWater has forecast that its total salaries and wages will rise by only 2.5% per annum, with the difference (1.5% per annum) being accounted for by (unspecified) productivity improvements.

SunWater proposed that the total direct labour costs (DLCs) of each service contract be used to allocate non-direct costs.

Total non-direct costs and those allocated to the Bundaberg WSS are in Table 5.4 below.

Table 5.4: SunWater's Actual and Proposed Non-Direct Costs (Real \$'000)

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
SunWater	27,831	25,097	25,872	24,579	25,152	23,770	23,512	24,244	24,055	23,708	25,089
Bundaberg WSS	1,290	990	888	1,067	1,168	829	745	805	819	776	698

Source: SunWater (2011a).

The non-direct costs for this scheme include a portion of SunWater's total overhead costs (for example, HR, ICT and finance), as well as a share of Infrastructure Management costs for each region (South, Central, North and Far North) and a share of the overhead costs of SunWater's Infrastructure Development Unit.

Other Stakeholders

CANEGROWERS ISIS (2011) submitted that water ordering and scheduling are not required within the scheme so these costs should not be included in the scheme's overhead costs.

CANEGROWERS (2011a) and irrigators during the second round of consultations (April 2011) raised concerns that field staff was decreasing but total staff numbers were unchanged. Irrigators prefer that the majority of staff in field doing work not overhead staff in Brisbane which does not increase service. Irrigators submitted that centralisation has moved staff from Bundaberg to Brisbane and that higher labour costs in Brisbane means costs have increased.

CANEGROWERS (2011b) questioned whether items such as water meter reading for groundwater are attracting overhead costs. Are they included as revenue offset?

CANEGROWERS (2011b) and irrigators at the second round of consultations (April 2011) questioned whether the labour mix of full time, casual and contract was appropriate? If there is spare labour then should there be more casuals and contractors? Further, the irrigators queried whether costs were attributed accurately to projects or are costs of people sitting around doing nothing attributed directly to schemes?

During the second round of consultations (April 2011) irrigators raised concern that overheads are too high. For example 61.3% of costs for preventive maintenance bulk are indirect and overheads. Indirect, overheads and other for operations bulk is 70% which is not operations costs but overheads.

During the second round of consultations (April 2011) irrigators also questioned whether items such as water meter reading for groundwater are attracting overhead costs. If so, are they included as revenue offset?

Authority's Analysis

As noted in Volume 1, the ratio of non-direct to total costs reflects the structure of the organisation. A more centralised organisation can be expected to have a higher ratio of non-direct to direct costs.

In seeking to establish prudence and efficiency, the Authority commissioned Deloitte Touché Tohmatsu (Deloitte) to review SunWater's non-direct costs. Deloitte carried out benchmarking to assess where potential efficiencies within SunWater may be achieved. Deloitte identified savings of \$495,314 (in 2010-11 real terms) per annum in finance, human resources, information technology, and health, safety, environmental and quality areas (for the whole of SunWater).

Deloitte was unable to draw any definitive conclusions from an attempt to benchmark against Pioneer Valley Water Board (PVWater) and other Australian rural water service providers. Deloitte noted that PVWater's non-direct costs were higher than those of SunWater as a percentage of total operating costs – but that there are differences between PVWater and SunWater which made the comparison unreliable.⁷

The Authority accepted that \$495,314 of full time equivalent staff costs were not efficient and should be excluded from SunWater's total non-direct costs (of which an amount of \$297,189 relates to irrigation service contracts under SunWater's proposed cost allocation methodology). See Volume 1.

In addition, the Authority recommended that SunWater's forecast total non-direct operating costs should be reduced by a compounding 1.5% per annum (based on the Authority's view that non-labour productivity gains are achievable in line with labour productivity gains).

The Authority also reviewed the allocation of non-direct costs to irrigation service contracts.

⁷ For example, PVWater have only four FTE staff. For the benchmarking exercise, PVWater needed to estimate the proportion of staff time spend on administration versus operations and maintenance activities, which varied considerably depending on weather conditions and workloads. Deloitte found it difficult to compare PVWater's estimated apportionments with SunWater, who have around 500 staff assigned to specific projects or centralised functions.

SunWater's proposed use of DLCs is on the basis that it best reflects activity and effort; is a proxy for other drivers; and provides consistency across service contracts.

Deloitte reviewed SunWater's proposed and identified alternative cost allocation bases (CABs). On the basis of this analysis, the Authority concludes that no alternative CAB is superior to DLC and that the introduction of any alternative would likely be costly and complex.

On this basis, the Authority therefore accepted SunWater's proposed DLC methodology with two exceptions recommended by Deloitte:

- (a) the overhead component of Infrastructure Management (Regions) should be allocated directly to the service contracts serviced by each relevant resource centre (South, Central, North and Far North), on the basis of DLC from each respective resource centre (that is, targeted DLC); and
- (b) the overhead component of the Infrastructure Development unit should be allocated (on the basis of DLC) to service contracts receiving services from that unit (that is, targeted DLC).

This adjustment ensures that schemes are paying for the overhead costs from those resource centres that are most directly related to their schemes and not, for example, for Infrastructure Management overhead costs from the other three regions.

Insurance and labour utilisation rates (which affect non-direct and direct costs) are addressed in Volume 1.

Stakeholder Submissions Received on the Draft Report

Non-direct costs were subject to detailed comments during the round 3 consultation. Irrigators raised the following concerns:

- (a) there has been a very large increase in non-direct costs in the past five years;
- (b) SunWater central costs are now more than 40% higher than was agreed in 2005-06, which irrigators consider is too high. Irrigators suggested that reducing non-direct costs by 2.7-8.9% [as per the Authority's Draft Report] is inadequate;
- (c) Deloitte's recommendation was based on the whole of SunWater having 34% centralised costs but irrigators generally pay 40-60% of costs. Irrigators considered that 50% non-direct costs is excessive;
- (d) irrigation service contracts are allocated a larger portion of non-direct costs than non-irrigation service contracts. The analysis by Deloitte is on SunWater as-a-whole rather than just irrigation service contracts where non-direct costs are much higher. SunWater's irrigation non-direct costs should be compared against Deloitte's sample – rather than SunWater as a whole;
- (e) irrigators suggested that SunWater wins contracts all over Australia with very high overhead costs because SunWater put less overheads into non-irrigation contracts to make them competitive and allocates more costs to irrigation service contracts. Irrigators are considered to be paying the overheads for commercial projects; and
- (f) the Authority should reduce non-direct costs to 34% in Bundaberg, which is the whole SunWater average.

BRIG (2011e) submitted that high levels of non-direct costs cannot be justified. BRIG recommended that the Authority review proposed non-direct costs on an annual basis until transparency is achieved.

CANEGROWERS Isis (2011a) submitted that the Bundaberg Bulk has an indirect and overhead cost greater than 52%, while SunWater allocates indirect costs and overheads to other service contracts at 24%. CANEGROWERS Isis noted that Deloitte reported SunWater's total indirect and overheads percentage of total costs is 34% and questioned why the indirect costs and overheads should not be applied at 34% of total costs across all sections of the business.

CANEGROWERS Isis also suggested that an alternative allocation methodology could be to use SunWater's gross revenue as the determinant for allocating non-direct overheads. CANEGROWERS Isis considered it reasonable to assume that many Head Office management staff direct their activities towards those areas of the business that generates the most revenue and therefore those activities should bear the greatest portion of the overhead charges.

BRIG (2011e) was concerned that irrigators are paying a share of overhead costs associated with the Infrastructure Development Unit. BRIG are unsure of the functions of this unit but assumes it deals with "new water" projects. If this is so, BRIG believes these costs should not be met by existing schemes.

Authority's Response to Submissions on the Draft Report

Quantum of Non-Direct Costs

In response to concerns raised during round 3 consultation in (a) and (b) above on the amount of SunWater's non-direct costs, the Authority notes that SunWater's non-direct costs have not increased markedly in total or for the Bundaberg WSS over the past five years. The Authority's review of SunWater's non-direct costs against available benchmarks identified savings as per the Draft Report.

Following the Draft Report, further information was received from SunWater about how savings from SLFI are taken into account in its operating cost estimates. This information is set out in Volume 1.

Proportion of Non-direct to Total Costs

In relation to the proportion of non-direct to total costs (as raised in items (c) through (f) and by other stakeholders), the Authority notes that in many schemes (including Bundaberg WSS), irrigators considered that the non-direct costs allocated to their schemes appeared to be high, and in some cases much higher than the SunWater-wide average ratio of non-direct to total costs. The reason for the wide variation of non-direct to total cost ratios across service contracts is because non-direct costs are allocated on the basis of DLC. It follows that if a service contract has a relatively high proportion of labour costs it will attract a relatively high proportion of non-direct costs.

In addition, the greater the indirect resources absorbed by a particular scheme, the higher will be the ratio of non-direct costs to direct labour costs. Together, these factors result in a relatively high non-direct to total cost ratio for irrigation service contracts

In relation to (c) above, Deloitte did not recommend that non-direct costs be allocated to service contracts using a SunWater average percentage figure.

The all-sector allocation of non-direct costs (overheads and indirects) is an average allocation across all irrigation and non-irrigation service contracts based on total organisation-wide direct labour costs.

However, overhead costs allocated to each service contract will vary because some service contracts incur higher direct labour costs than others, which attract a higher proportion of overhead costs. In addition, some schemes use more indirect services than others. For example, the headworks indirect cost function provides support to bulk service contracts only because these are the only service contracts to have dams, weirs, and barrages.

The combination of these two factors explains the wide variation in the proportions of non-direct to total costs across service contracts.

The proportions of direct labour and indirect costs in the cost mix for Bundaberg WSS gives rise to a proportion of non-direct costs in its total costs (43%) which is higher than the organisation-wide average documented by Deloitte (31%).

Therefore, the Authority does not recommend (item (f)) that a SunWater-wide average of overhead costs should be adopted in the Bundaberg WSS. Instead the Authority believes that costs should be allocated as accurately as possible to each scheme based on an appropriate allocation methodology (see below).

Allocation of Non-directs to Service Contracts

In regard to the allocation of non-direct costs to irrigation service contracts, the Draft Report recommended a change to SunWater's approach to allocating non-direct costs for Infrastructure Management (IM) and Infrastructure Development (ID). The Authority recommended (regionally) targeted DLC. SunWater recommended state-wide DLC, consistent with SunWater's general approach to the allocation of other non-direct costs.

However, as set out in Volume 1, in the light of new information submitted by SunWater, the Authority now considers that the benefit of using targeted DLC is unlikely to outweigh the additional complexity and cost of implementing and maintaining this alternative approach. It is proposed to adopt the approach initially proposed by SunWater.

Accordingly, the Authority has amended its recommendation (removing the recommendation to adopt targeted DLC for these cost centres).

For the Final Report, the cost of options analyses and consultation with customers on renewals items (\$445,000 for Sunwater as a whole) has also been allocated to schemes on the basis of direct labour.

The proposal that gross revenues be adopted as an allocation method, is not accepted. Deloitte (2011) reviewed cost allocation methods and supported the use of direct labour costs (DLC) for the reasons outlined in the Draft Report. Essentially, SunWater's costs are predominantly driven by the requirement to maintain and operate assets. Non-direct costs are closely related to such activities which draw primarily on labour. To the extent that head office staff direct their activities to revenue generating activities, their costs are allocated to direct labour costs (as suggested). DLC is therefore regarded as an appropriate basis for allocating non-direct costs.

Moreover, the gross revenue argument would be circular, as a cost allocation method needs to be decided prior to determining prices and therefore gross revenue.

Remaining Scheme Specific Concerns

The Authority has not recommended an annual review of non-direct costs (as suggested by BRIG), as this is considered impractical for administrative and procedural reasons.

The Authority agrees that the transparency of SunWater's costs can be improved through strengthened information systems and consultation mechanisms, and has made appropriate recommendations in this regard.

In relation to BRIG's concerns regarding Infrastructure Development Unit costs, the Authority notes that, as outlined in the Deloitte report, the functions of the Infrastructure Development Unit are to undertake all infrastructure projects internal to SunWater and those with external clients. Accordingly, Infrastructure Development are not involved exclusively with new infrastructure projects but are involved in the infrastructure requirements of existing WSSs.

As noted in Volume 1, Deloitte have confirmed that SunWater does not recover ID costs related to new water projects from existing customers, as this is effectively a research and development function of the business for new clients, and not existing customers.

The Authority's recommended level of non-direct costs to be recovered from the Bundaberg WSS (from all customers) is set out in Table 5.5 below. The allocation of these costs between high and medium priority customers is discussed below.

Table 5.5: Recommended Non-Direct Costs (Real \$'000)

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
SunWater	1,290	990	888	1,067	1,168	829	745	805	819	776	698
Authority Draft Report	-	-	-	-	-	-	717	662	656	727	641
Authority Final Report							737	688	676	733	649

Note: A minor summation error in the Draft Report has been corrected for the Final Report. Source: SunWater (2011ap), QCA (2012).

5.4 Direct Costs

Introduction

SunWater classified its operational activities into operations, preventive maintenance, corrective maintenance and electricity. SunWater's operating costs were forecast using this classification. The nature of these activities and costs are identified further below.

With the exception of electricity, SunWater has disaggregated each of the above activities into the following cost types:

- (a) labour – direct labour costs attributed directly to jobs, not including support labour costs such as asset management, scheduling and procurement, which are included in administration costs;
- (b) materials – direct materials costs attributed directly to jobs including pipes, fittings, concrete, chemicals, plant and equipment hire;
- (c) contractors – direct contractor costs attributed directly to jobs, including weed control contractors, commercial contractors and consultants; and

- (d) other – direct costs attributed directly to service contracts, including insurance, local government rates, land tax and miscellaneous costs.

Draft Report

Stakeholder Submissions

SunWater

SunWater estimated the costs of each activity in 2010-11, based on actual costs over the past four years (excluding spurious costs) with adjustments for known or expected changes in costs. Adjustments were also made to preventive maintenance in line with the Parsons Brinckerhoff (PB 2010) review. These estimates were then escalated forward for the 2012-17 pricing period. Further details are outlined in Volume 1.

SunWater's forecast direct operating expenditure by activity is set out in Table 5.6 below. These estimates reflect SunWater's most recent positions and differ from the NSP. The estimates also reflect the most recent information provided by SunWater to the Authority in October 2011.

Table 5.6: SunWater Direct Operating Expenditures by Activity (Real \$'000)

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Operations	463	360	396	534	446	353	356	356	356	356	356
Electricity	7	7	7	7	5	8	10	10	11	12	13
Preventive Maintenance	86	76	52	50	30	115	117	117	117	117	117
Corrective Maintenance	65	39	76	118	621	66	67	68	68	69	69
Total	620	482	532	709	1,101	542	549	551	553	555	556

Note: Totals vary from NSP due to SunWater's revised approach to insurance and electricity, exclusion of revenue offset (which is dealt with in the following chapter), and rounding. The estimates also reflect the most recent information provided by SunWater to the Authority in October 2011. Source: SunWater (2011ap) and SunWater (2011ao).

Table 5.7 presents the same operating costs developed by SunWater on a functional basis.

Table 5.7: SunWater Direct Operating Expenditures by Type (Real \$'000)

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Labour	352	249	213	410	426	292	296	296	296	296	296
Electricity	7	7	7	7	5	8	10	10	11	12	13
Contractors	43	40	93	59	430	49	50	51	52	52	52
Materials	51	24	33	41	87	39	40	40	41	42	42
Other	167	162	185	192	154	154	154	154	154	153	153
Total	620	482	532	709	1,101	542	549	551	553	555	556

Note: Totals vary from NSP due to SunWater's revised approach to insurance and electricity, exclusion of revenue offset (which is dealt with in the following chapter), and rounding. The estimates also reflect the most recent information provided by SunWater to the Authority in October 2011. Source: SunWater (2011ap) and SunWater (2011ao).

Authority's Analysis

The Authority engaged Aurecon to review the prudence and efficiency of SunWater's proposed direct operating expenditure for this scheme.

Aurecon (2011) reported that the major limitation to its review was the lack of precise information from SunWater, particularly given the tight time frames for its study. Although Aurecon found that SunWater staff were willing to provide information as requested, a number of difficulties were still encountered, including that:

- (a) reports due for completion in 2010, were still incomplete during the review period;
- (b) obtaining operational trend expenditure information was difficult due to the implementation of the Business Operating Model (BOM) and management accounting system;
- (c) historical cost data, which had been re-coded for entry into the BOM, could not be traced or verified;
- (d) the capacity of the BOM to extract specific data for analysis was limited;
- (e) the incorporation of indirect and overhead costs in all activities made it difficult to assess the activity related expenditure; and
- (f) retrieving information regarding individual assets was difficult.

Aurecon also noted that SunWater has developed a new electronic Asset Management System, which has greatly improved information capture and asset management data, but access to all components of this system is limited to a handful of computers and personnel located within the Brisbane office. Extracting specific asset information was extremely time-consuming for all involved.

Aurecon concluded that SunWater underestimated the level of detail and information required for the review. This impacted SunWater's capacity in many cases to provide the requested information within the required timeframes. Aurecon therefore found that significant information gaps still exist, which hindered its capacity to adequately assess the prudence and efficiency of all proposed operational expenditure.

In Volume 1, the Authority recommended that SunWater undertake a review of its planning policies, processes and procedures to better achieve its strategic objectives. The Authority also recommended that SunWater needs to improve the usefulness of its information systems. In particular, SunWater needs to document and access relevant information necessary to:

- (a) attain greater operating efficiency;
- (b) achieve greater transparency;
- (c) facilitate future price reviews; and
- (d) promote more meaningful stakeholder engagement.

Aurecon's review of specific cost categories for this scheme and the Authority's conclusions and views on cost escalation are outlined below.

Final Report

As noted in Volume 1, to achieve greater transparency, the Authority has also recommended that SunWater's Statement of Corporate Intent (and relevant legislation) require SunWater to consult with customers in relation to forecast and actual operating expenditure and publish on its website, annually updated NSPs (containing this and renewals information) commencing by 30 June 2014. The NSPs should be enhanced to present details of SunWater's proposed operating expenditure and to account for significant variances between previously forecast and actual material operating expenditure.

In this manner, greater transparency will be achieved over time.

Review of Direct Operating Expenditure Items

Item 1: Operations

Draft Report

Stakeholder Submissions

SunWater noted that operations relate to the day to day operational activity (other than maintenance) enabling water delivery, customer management, asset management planning, financial and ROP reporting, workplace health and safety compliance, administration, and environmental and land management.

SunWater's operating expenditure forecasts have been developed on the basis of detailed work instructions and operational manuals for each scheme.

SunWater's proposed operations costs are set out in Table 5.6 above.

CANEGOWERS (2011) noted that operations costs are estimated to fall by 15% over the next five years in real terms which is a 2% increase in nominal terms by 2015-16.

CANEGOWERS (2011) questioned whether insurance costs forecast at \$90,000 are for the bulk scheme or bulk and distribution combined.

Authority's Analysis

Aurecon reviewed SunWater's operations costs in more detail as shown in Table 5.8.

Table 5.8: Operations Expenditure by Type (\$2010-11, \$'000)

Type	Actual					Forecast				
	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Labour	242	161	156	309	165	167	167	168	169	169
Materials	17	3	2	2	2	2	2	2	2	2
Contractors	42	35	54	32	29	29	29	30	30	31
Other	161	162	185	191	146	146	145	145	146	146
<i>Total Direct Costs</i>	<i>463</i>	<i>360</i>	<i>396</i>	<i>534</i>	<i>342</i>	<i>344</i>	<i>343</i>	<i>345</i>	<i>347</i>	<i>348</i>
Indirects	500	287	230	274	143	143	164	175	167	157
Overheads	264	190	180	339	170	171	174	176	177	172
Total	1,227	838	807	1,147	655	658	681	696	691	677

Source: Aurecon (2011). Note: This table is based on SunWater's original NSP and may differ from more recent SunWater data. Totals may not match SunWater's NSP due to rounding.

Particular observations by Aurecon were that:

- (a) operations costs comprise between 62% and 78% of total operating costs;
- (b) water usage in the 2006-07 was 80% (of 2006 levels) and operations costs were \$1.22 million. Water use in 2010 increased slightly to 82% but operations costs decreased to \$1.14 million; and
- (c) cost items in the 'other' category included insurance (\$90,000 in 2010-11), rates (\$17,000) land tax (\$23,000 in 2010-11) and other administrative costs.

Aurecon provided a summary of the operations costs by activity for the four years 2006-07 to 2009-10 (Table 5.9).

Table 5.9: Operations Expenditure by Activity (\$2010-11, \$'000)

	2006-07	2007-08	2008-09	2009-10
Customer Management	53	-	-	68
Workplace H&S	-	-	-	3
Environmental Management	167	-	-	73
Water Management	70	168	156	152
Scheme Management	613	405	413	646
Dam Safety	156	39	69	59
Schedule /Deliver	141	173	95	108
Metering	2	52	67	37
Facility Management	5	1	6	-

Source: Aurecon (2011). Note: includes indirect and overhead costs. This table is based on SunWater's original NSP and may differ from more recent SunWater data.

Significant items include:

- (a) water management – activities related to announcement of water allocations, water quality monitoring and sampling, blue-green algae management, shoreline inspections, monitoring of groundwater levels. Contractors are used for water quality monitoring. SunWater noted that 2006-07 was a transition year in switching from the previous internal trade model to the new Business Operating Model, giving rise to comparability problems with line items;
- (b) scheme management – energy management, land and property management, manual development, scheme strategies, facility contingency plans and emergency action plans, system leakage management plans (SLMPs), insurance, rates and land taxes;
- (c) dam safety – routine monthly dam inspections, monitoring of embankments, piezometers, seepage surveillance, compliance documentation and reporting;
- (d) schedule/deliver – scheduling, releasing, operations of pump stations and SCADA, monitoring of water entitlements, reporting of breaches, water harvesting, ROP compliance of water levels and flows; and
- (e) metering – costs incurred in reading meters.

Aurecon noted that the provision of disaggregated historical activity data for operations by SunWater, provided substantial insights, but identified substantial activities and issues requiring additional information and explanation from SunWater.

Aurecon also noted that SunWater was not able to provide 2010-11 cost estimates for the sub-activities, which Aurecon views as critical in verifying the prudence and efficiency of these costs. Aurecon recommends that to fully verify the prudence and efficiency of 2010-11 expenditure, the following information and analysis is required:

- (a) 2010-11 cost estimates for sub-activities be released and examined to ensure compliance with SunWater's averaging methodology for preceding four years;

- (b) cost estimates for metering be based on 2009-10 costs (assuming that is the first time all installed meters were read, and major labour efficiency measures were gained in comparison to 2008-09); and
- (c) the Dam Safety forecast 2010-11 cost is reduced by \$5,500 to account for the transfer of activities to Preventive Maintenance.

Due to the above data limitations, Aurecon was unable to validate fully the prudence and efficiency of operations costs.

In the Draft Report, the Authority recommended that SunWater staff continue to conduct all quarterly meter reads.

The Authority noted that Aurecon did not recommend any adjustment to operations costs for this scheme.

The Authority noted that the consultants engaged to review operations costs in other SunWater schemes (Halcrow (2011), GHD (2011) and Arup (2011)) also did not recommend any adjustment to operations costs.

Further, SunWater's forecast average annual operations costs are approximately 21% lower than the average over 2006-11.

On the basis of the consultants' reviews and SunWater's internal cost reductions over time, the Authority did not specifically adjust SunWater's operations cost forecast.

In response to stakeholder submission, the Authority noted that the \$90,000 insurance costs presented by SunWater relate to the Bundaberg (bulk) WSS only. A further \$475,000 of insurance costs is attributed to the Bundaberg Distribution System.

The Authority noted that Aurecon did not conduct a detailed review of SunWater's insurance costs for Bundaberg WSS, but a detailed assessment of SunWater's total insurance costs is included in Volume 1. The Authority noted that Aurecon's queries to SunWater revealed that insurance costs were forecast to decrease from \$138,000 in 2009-10 to \$90,000 in 2010-11.

Final Report

No submissions on these matters were received in response to the Draft Report and the Authority has not identified any other grounds to alter its approach. (Submissions relating to Paradise Dam are dealt with in the previous chapter). No changes are therefore proposed for the Final Report.

Item 2: Preventive Maintenance

Draft Report

Stakeholder Submissions

SunWater defines preventive maintenance as maintaining the ongoing operational performance and service capacity of physical assets as close as possible to designed standards. Preventive maintenance is cyclical in nature with a typical interval of 12 months or less.

Preventive maintenance includes:

- (a) condition monitoring: The inspection, testing or measurement of physical assets to report and record its condition and performance for determination of preventive maintenance requirements; and
- (b) servicing: Planned maintenance activities normally expected to be carried out routinely on physical assets.

Preventive maintenance costs are based on the updated work instructions developed for operating the scheme and an estimate of the resources required to implement that scope of work.

SunWater's proposed preventive maintenance costs are identified in Table 5.6 above.

CANEGROWERS (2011) raised concerns that assets were not been properly maintained which may impact on levels of service.

During the second round of consultations (April 2011) irrigators raised concern regarding declining levels of service delivery as assets are not being maintained properly. Irrigators were also concerned that unused SunWater staff time had been booked against preventive maintenance activities.

Consultant's Review

Aurecon observed that:

- (a) In 2006-07, costs that should have been coded to refurbishment were included in preventive maintenance causing a spike in these costs. Corrective maintenance costs were likewise understated;
- (b) The average annual preventive maintenance costs between 2006-07 and 2009-10 were \$205,000 per annum. For 2010-11, projected preventive maintenance costs is \$292,000 representing an increase of 42.4%;
- (c) Although preventive maintenance should generally be correlated to usage, Aurecon did not find a consistent correlation;
- (d) In 2010-11, 61% of preventive maintenance costs were indirect costs and overheads, 33% was labour and 3% was materials, 2% contractors and 1.5% other. The 2010-11 cost structure was used as a basis for 2012-17;
- (e) The total cost of labour at \$96,000 in 2010-11 was more than double the average of \$45,000 for 2007-08 to 2009-10; and
- (f) Weed control costs declined from \$55,000 (2006-07) to \$22,000 (2009-10), with labour component ranging from \$4000 to \$13,000.

Aurecon noted that SunWater's proposed labour costs for preventive maintenance of \$96,000 in 2010-11 are informed by a study by PB in 2010. PB proposed that for 2010-11, a total of 1,569 hours would be required at a total cost of \$90,957 for condition monitoring and servicing. This included 278 hours of new monitoring and inspection activities.

In assessing historical preventive maintenance costs, Aurecon noted the differences between 2007 observations and later years (possibly due to error due to the change in the business model used). However, SunWater advised that 2006-07 was a transition year in which the previous

internal trade model was removed and the new BOM model developed and implemented in 2007-08. This causes difficulties in comparability over this time period.

Aurecon identified historical preventive maintenance between 2006-07 and 2009-10 at an average of 882 hours (noting that 2007 data was questionable) and labour at an average of \$37/hour. Aurecon recommended that an audit of historical activities (particularly 2009-10) be undertaken to identify if all activities were previously undertaken and if coding errors resulted in these costs being allocated to other activities before accepting SunWater's proposal of 1,569 hours of labour input.

Aurecon also noted that the 2010-11 hourly labour rate adopted by PB (\$58/hour) exceeded SunWater's actual costs in 2009-10 (\$36/hour), possibly due to an assumption by PB of the utilisation of more senior SunWater staff.

Aurecon recommended that 1,160 hours of labour be budgeted at \$50/hour at a total cost of \$58,000 for these activities (882 being the average between 2006-07 and 2009-10 and 278 additional hours recommended by SunWater). Aurecon further recommended that an allowance of \$7,800 should be provided for the labour input to weed control costs, based on a 10% mark-up on the four-year average of these costs.

In total for labour for monitoring and weed control, Aurecon recommended that the \$96,000 estimate projected by SunWater be revised to \$65,800.

Aurecon's analysis results in a reduction of \$30,200 in total preventive maintenance, to be applied to each year for the next pricing period.

SunWater's Response

In relation to Aurecon's suggested reductions in labour costs related to preventive maintenance based on a four year historical average, SunWater submitted that past data is not a reliable indicator of actual costs or work. SunWater noted that some past preventive maintenance at storages was booked to operations, rather than preventive maintenance.

SunWater considered that the PB review (which informed SunWater's submission) identified the labour effort and materials – contractor costs for each maintenance item from first principles. SunWater submitted that this was a thorough and detailed review undertaken by an independent party, is forward looking and is the best source of reliable information for Operations costs forecasts.

In response to Aurecon's comments regarding the difference in wages rates between SunWater's historic costs, and those recommended by PB, SunWater responded that the costs for 2010-11 were based on information received from field staff through consultation. Each preventive maintenance job was costed by identifying the different staff required to complete the work. Depending on the level of employee, different hourly labour rates were used.

Further, SunWater submitted that, in reviewing its preventive maintenance activity costs, Aurecon (and Halcrow in its review of WSSs in the North region) tried to evaluate the costs by sub activity. This has occurred because there is information about two of the three preventive maintenance sub-activities cost, condition monitoring and servicing, which were recently reviewed and quantified by PB. SunWater noted that Aurecon took the PB costs and concluded that the residual relates to weed control.

Aurecon then looked to understand the basis of this residual and evaluate whether it was prudent and efficient. In some cases, Aurecon compared the residual to past labour costs for weed

control, and used historic figures as proxy for weed control labour costs to recommend adjustments to the preventive maintenance activity costs.

SunWater stated that it is understandable that Aurecon would follow this logic given the information provided, and its frustration about the lack of data to support this residual is apparent.

SunWater submitted that its expenditure forecasts, particularly labour costs, are not intended to be viewed at the sub-activity level, and indeed examining labour costs even at the activity level should be done with some caution. This is because labour is shared between activities and schemes, and any examination of the costs will tend to be more about the assumptions about how the existing workforce will spend its time, rather than an overall assessment of efficiency.

SunWater accepted that discrepancies exist when comparing the 'residual' labour costs for weed control against historic costs for weed control. However, SunWater did not recommend examining costs at the sub-activity level, given:

- (a) historic costs are heavily dependent on how employees have recorded their time, and there scope for error in these entries; and
- (b) forecasts were developed at the activity, not sub-activity level. Attempts to recreate a labour or other cost at the sub-activity level will be fraught and misleading.

SunWater suggested that a better approach, which more closely aligns with its workforce arrangements, is to examine the labour costs for each WSS at the scheme level, and assess whether the total labour dedicated to that scheme is efficient for a given level of workload.

SunWater did not agree with recommendations made in relation to preventive maintenance costs which are made on the basis of examining labour costs at the sub activity level.

Authority Analysis

In the Draft Report, the Authority noted that most of its consultants considered that that there is scope for SunWater to achieve further efficiencies once the balance of preventive and corrective maintenance is optimised. The Authority considered that this potential for efficiency could be addressed via the broad efficiency measures imposed on SunWater schemes (noted further below).

In Volume 1, the Authority also recommended that SunWater implement PB's earlier recommendations that:

- (a) SunWater's maintenance plans and work instructions; and associated labour inputs and unit costs should be audited, including a review of sub-contracted maintenance activities;
- (b) maintenance practices and costs need to be examined to identify the optimum mix of preventive and corrective maintenance activities for each scheme; and
- (c) a Reliability Centred Maintenance (RCM) approach to formulating maintenance activity requirements should be adopted.

For this scheme, the Authority notes Aurecon's suggested revisions to SunWater's preventive maintenance costs, and also SunWater's responses. As noted by SunWater, the Authority considers that Aurecon's analysis reflects the level of information provided to them. SunWater objects to Aurecon's use of historical costs to forecast labour costs to inform forecast labour costs, based on the fact that historical labour data is not reliable. However, the Authority notes that the historical cost data was provided by SunWater. The Authority does not consider that

adopting SunWater's forecasts in place of those recommended by Aurecon because SunWater's historical data is unreliable provides the appropriate regulatory incentives.

In objecting to Aurecon's findings regarding weed control, SunWater submitted that costs be reviewed on a scheme-wide basis, rather than on a sub-activity basis. However, the Authority considers that it is necessary to understand the sub-activities performed by SunWater staff to be able to evaluate the efficiency of labour costs.

The Authority accepts Aurecon's recommendations, and has reduced SunWater's proposed preventive maintenance costs by \$30,200 per annum in its recommended tariffs.

Final Report

No submissions on these matters were received in response to the Draft Report and the Authority has not identified any other grounds to alter its approach. No changes are therefore proposed for the Final Report.

Item 3: Corrective Maintenance

Draft Report

Stakeholder Submissions

SunWater submitted that even with sound preventive maintenance practices, unexpected failures can still occur or other incidents can arise that require reactive corrective maintenance.

SunWater identifies two types of corrective maintenance activities:

- (a) emergency breakdown maintenance which refers to maintenance that has to be carried out immediately to restore normal operation or supply to customers or to meet a regulatory obligation (e.g. rectify a safety hazard); and
- (b) non-emergency maintenance which refers to maintenance that does not have to be carried out immediately to restore normal operations, but needs to be scheduled in advance of the planned maintenance cycle.

SunWater has forecast corrective maintenance based on past experience. This provision includes a portion of labour costs in the scheme for such events, as well as additional materials and plant hire.

The corrective maintenance forecast does not include any costs of damage arising from events covered by SunWater's insurance.

SunWater's proposed corrective maintenance costs are set out in Table 5.6 above.

No other stakeholders commented on this item prior to the Draft Report.

Consultant's Review

Aurecon noted that corrective maintenance costs mainly related to indirect costs and overheads (44%), labour (22.4%), materials and contractors (12.8%) and other (7.8%).

Aurecon noted the difficulty in forecasting corrective maintenance costs, and that SunWater's approach of using historical expenditure as a basis for forecasting is commonly used by other water utilities. On this basis, the annual average direct cost was \$75,000 (excluding indirect

costs and overheads). This compares to SunWater's forecast of \$65,000 for the period starting at 2010-11. Aurecon considered SunWater's forecast to be prudent and efficient.

Authority's Analysis

As noted above, in Volume 1 the Authority recommended an optimal mix of preventive and corrective maintenance should be pursued by SunWater. Further, for corrective maintenance, the Authority recommends that SunWater formally document its processes for the development of correct maintenance expenditure forecasts.

For this scheme, the Authority accepted Aurecon's recommendations, and included SunWater's proposed Corrective Maintenance costs in recommended tariffs.

Final Report

No submissions on these matters were received in response to the Draft Report and the Authority has not identified any other grounds to alter its approach. No changes are therefore proposed for the Final Report.

Item 4: Electricity

Draft Report

Stakeholder Submissions

The electricity costs for the scheme relate to the electricity required for the operation of Fred Haigh Dam and Ned Churchward Weir for lighting and for powering their mechanical installations.

SunWater submitted that additional electricity costs at the Monduran Pump Station should be attributed to bulk water service to account for water pumped to the Burnett River.

SunWater (2011h) initially proposed that electricity costs increase in line with inflation with prices adjusted annually (cost pass through) to reflect the actual change in electricity costs.

SunWater (2011ak) subsequently proposed to escalate electricity prices by 10.5% per annum over the regulatory period reflecting the average in the Benchmark Retail Cost Index (BRCI) between 2007-08 and 2011-12, together with further adjustments in 2012-13 and 2015-16 to reflect expected increases from the introduction of the carbon tax and carbon trading scheme.

SunWater's proposed electricity costs are set out in Table 5.6 above.

CANEGROWERS ISIS (2011) submitted that the Authority should investigate the options for delivering cheaper electricity charges for the Bundaberg Water Supply Scheme by moving to the contestable market. While SunWater may prefer to stay with Ergon Energy, it may be to irrigators' advantage in Bundaberg to swap to another electricity supplier.

Consultant's Review

Aurecon did not review SunWater's electricity costs.

Authority's Analysis

In Volume 1, the Authority recommended that SunWater review the cost differential between franchise and contestable electricity contracts on an annual basis. Further, that SunWater report

back to stakeholders on the success (or otherwise) of its energy savings measures, and quantify the savings that have been achieved.

The Authority proposed electricity be escalated at 7.41% per annum, based on expected growth in the four key components of electricity prices – network costs, energy costs, retail operating costs and retail margin.

In the Draft Report, the Authority did not accept an escalation rate that made an explicit allowance for carbon price impacts prior to them becoming enacted legislation.

The Authority has adjusted proposed electricity costs as set out in Table 5.10 below.

The Authority accepted SunWater proposal to attribute 8% or \$118,000 of costs from the Gin Gin Main Channel to the Bundaberg (bulk) WSS. This issue is addressed in detail in Chapter 3 above.

Submissions Received from Stakeholders on the Draft Report

At round three consultation (December 2011), stakeholders submitted that the Authority needs to verify the starting balance of electricity costs.

BRIG (2011) stated that the uncertainty and impacts associated with the proposed carbon tax, the Authority's pending review of Queensland electricity tariffs and the proposed annual review of the cost differential between contestable and franchise tariffs, means that electricity costs cannot be estimated with any acceptable level of confidence.

BRIG submitted that the proposed approach for an end of regulatory period adjustment for electricity (should electricity costs increase by more than 7.41%) is not acceptable on the basis that it could lead to inter-generational shifts in price.

BRIG recommended an annual cost pass-through (one year in arrears) audited by the Authority, as the preferred option. This would be achieved through the cost pass-through being applied to electricity only (through the proposed Part E tariff).

Final Report

The Authority notes that actual electricity costs in the Bundaberg WSS have been around \$7,000 in each year from 2006-07 to 2009-10.

Following the Draft Report, the Authority engaged NERA to review the appropriateness of SunWater's electricity cost forecasting model. NERA found that, in general, SunWater's electricity model was appropriate, with a minor issue in relation to indexation (see Volume 1).

The Authority accepts that SunWater's electricity model is appropriate and has accepted NERA's minor adjustments to 2010-11 electricity cost estimates, to which the Authority's cost escalation factors are applied (see Volume 1).

Further information relevant to electricity cost escalation was available following the Draft Report. This included the release of the Authority's Draft Determination regarding the review of regulated (franchise) tariffs, the passing of relevant legislation relating to a carbon tax and the Australian Government's forecast of the impact of carbon trading.

As a result, and as set out in Volume 1, the Authority revised its recommended escalation of electricity costs.

The Authority recommends that electricity should be escalated by 6.6% in 2011-12, 12.5% in 2012-13 and 7% per annum for subsequent years, with the exception of 2015-16 where 8% will apply (reflecting a further 1% increase from the introduction of carbon trading). Proposed electricity costs are set out further below.

Item 5: Labour Costs

Submissions Received from Stakeholders on the Draft Report

BRIG considered that Sun Water has not demonstrated any ability to manage its labour costs in an efficient manner. BRIG commented on SunWater's inability to use a zero base budgeting approach. BRIG submitted that SunWater appeared to adopt a budgeting approach that keeps employee numbers constant even though it justifies some capital expenditure by claiming labour savings.

BRIG requested the QCA consultant examine whether SunWater had appropriate levels of staffing and mix of contractors and its own employees at its operating locations. However, this issue does not appear to have been addressed in any detail. BRIG acknowledged that this issue was, however, investigated at head office.

Authority's Response to Submissions Received on the Draft Report

The Authority notes that SunWater has indicated it previously sought to apply zero-based budgeting, but without particular success. The Authority agrees that SunWater needs to strengthen the planning and management of its labour costs, including improved budgeting and variance analysis, but has made alternative recommendations relating to the need to address these matters.

In relation to the staffing and mix of contractors, the Authority reviewed whether activities in Dawson WSS and Theodore Distribution System could be undertaken more cost effectively by local contractors not SunWater staff. It was found that while tasks could be undertaken by local contractors, it would require extensive training to ensure compliance with SunWater's health and safety processes.

There was an insufficient value of works orders in these schemes to justify SunWater vetting, training and commissioning local contractors. The Authority concluded that it is unlikely to be cost effective for SunWater to employ local contractors in these service contracts, when taking into account the associated size, number, complexity, range of skills and training required. The Authority did not review the mix of SunWater staff and local contractors in Bundaberg. However, no evidence was found in the reviews (above) that SunWater could be more efficient through the engagement of local contractors.

Bundaberg is a larger scheme and further reviews may (or may not) have revealed different results, however, within the time constraints of the review this was not done. The Authority cannot, therefore, draw a robust conclusion, but has recommended other cost savings to ensure that staff mix Bundaberg be efficient (refer to relevant sections of this Final Report and Volume 1).

Further, the Authority notes that over 2006-07 to 2010-11 the average labour cost per year in the Bundaberg WSS was \$330,000. SunWater proposed annual expenditure on direct labour of \$296,000 going forward.

As noted above, Aurecon was able to examine labour costs in their review of preventive maintenance in the Bundaberg WSS, as this information was available. Aurecon's analysis resulted in a reduction of \$30,200 in total preventive maintenance, to be applied to each year for the next pricing period. However, Aurecon was unable to review other direct labour costs.

Aurecon's recommendation has been accepted by the Authority.

Item 6: Cost Escalation

Draft Report

As noted in Volume 1, the Authority's consultants were required to examine the appropriateness of SunWater's proposed cost escalation methods (electricity has been dealt with above).

Direct Labour

The consultants generally agreed that SunWater's labour escalation forecast using the general inflation rate (2.5%) underestimated the likely actual movement in the cost of labour.

Evidence cited included the growth in both the Labour Price Index for the Electricity, Gas, Water and Waste Services Industry and the Labour Price Index for Queensland, which have averaged around 4% per annum in recent years, and recent forecasts by Deloitte suggesting an average increase in the labour costs facing Queensland's utilities sector of 4.3% per annum between 2011-12 and 2017-18.

The Authority recommended that labour costs be escalated at 4% per annum.

Direct Materials and Contractors

Most consultants agreed that SunWater's proposed escalation factor of 4% per annum for this component of cost was appropriate. Evidence in support included the historical analysis of Australian Bureau of Statistics (ABS) construction cost data and forecasts of industry trends. However, both Halcrow and GHD considered that SunWater had not provided sufficient rationale for its proposed escalation factor of 4% per annum for direct materials and contractor services, and that these costs should be escalated at the general rate of inflation.

The Authority recommended that direct materials and contractor costs be escalated at 4% per annum.

Other Costs

The Authority accepts SunWater's proposal to escalate other direct costs and all non-direct costs by the general inflation rate as these costs are primarily administrative and management functions.

Final Report

No submissions on these matters were received in response to the Draft Report and the Authority has not identified any other grounds to alter its approach. No changes are therefore proposed for the Final Report.

Conclusion

Draft Report

A comparison of SunWater's and the Authority's direct operating costs for the Bundaberg WSS is set out in Table 5.10. The Authority's proposed costs included all specific adjustments and the Authority's proposed cost escalations as noted above. As noted in Volume 1, the Authority applied a minimum 2.43% saving to direct operating costs (excluding electricity) in 2012-13. A further 0.75% saving arising from labour productivity was also applied, compounding annually.

Submissions Received from Stakeholders on the Draft Report

CANEGROWERS Isis (2011a) submitted that there are no incentives for SunWater to achieve efficiencies beyond those recommended by the Authority. CANEGROWERS Isis believed that these productivity gains will become the maximum productivity gains rather than continually striving for the greatest potential gain in efficiency.

Authority's Response to Submissions Received on the Draft Report

The Authority notes, in the absence of an application for review of prices during the 2012-17 period, SunWater can retain cost savings that it makes in excess of those recommended by the Authority. In this regard, the Authority considers that SunWater does have incentive to reduce costs to the greatest extent possible.

For the Final Report, the Authority's proposed costs include a change to the escalation of electricity costs to reflect new information.

Further, as noted in Volume 1, in the Draft Report the Authority inadvertently understated cost saving percentage estimates. These have been corrected and as a result, the Authority has now applied a minimum 4.5% saving to direct operating costs (excluding electricity) in 2012-13. A further 0.75% saving arising from labour productivity is also applied annually.

The Authority's final recommended direct costs are shown below compared to the Draft Report recommendations.

Table 5.10: Direct Operating Costs (Real \$'000)

	<i>SunWater</i>					<i>Authority</i>				
	<i>2012-13</i>	<i>2013-14</i>	<i>2014-15</i>	<i>2015-16</i>	<i>2016-17</i>	<i>2012-13</i>	<i>2013-14</i>	<i>2014-15</i>	<i>2015-16</i>	<i>2016-17</i>
Operations	356	356	356	356	356	343	343	343	343	343
Electricity	10	10	11	12	13	8	8	9	9	10
Preventive Maintenance	117	117	117	117	117	112	113	114	115	115
Corrective Maintenance	67	68	68	69	69	65	65	66	66	66
Total	549	551	553	555	556	528	530	532	533	534
Final Report										
Operations						342	343	343	343	343
Electricity						9	9	10	10	11
Preventive Maintenance						119	120	121	122	122
Corrective Maintenance						68	68	69	69	69
Total						538	540	542	544	545

Note: Totals vary from NSP due to SunWater's revised approach to insurance and electricity, exclusion of revenue offset (which is dealt with in the following chapter), and rounding. The estimates also reflect the most recent information provided by SunWater to the Authority in October 2011. Source: SunWater (2011ap) and SunWater (2011ao).

5.5 Cost Allocation According to WAE Priority

It is necessary to establish a methodology to allocate operating costs to the differing priority groups of WAE.

Previous Review

For the 2006-11 price paths, all costs were apportioned between medium and high priority customers according to WPCFs in both bulk and distribution systems.

Draft Report

Stakeholder Submissions

SunWater

SunWater (2011j) has proposed to assign operating costs to users on the basis of their current WAE, except for non-direct costs allocated to renewals (on the basis of DLC) which are to be allocated to priority groups using HUFs. SunWater's proposed HUF for this scheme is set out in Chapter 4 Renewals Annuity.

Other Stakeholders

BRIG (2011) noted that intuitively the number of staff per ML involved in river operating must be much less than those involved in the channel operations.

Authority's Analysis

In Volume 1, the Authority summarised the views of its consultants and has recommended that, in relation to bulk schemes:

- (a) variable costs be allocated to medium and high priority WAE on the basis of water use;
- (b) fixed preventive and corrective maintenance costs be allocated to medium and high priority WAE using HUFs; and
- (c) for fixed operations costs 50% be allocated using HUFs and 50% using current nominal WAEs.

The Authority recommended that within bulk service contracts, insurance premiums are allocated between medium and high priority customers on the basis of HUFs.

The effect for the Bundaberg WSS is detailed in the following chapter (as it takes into account other factors relevant to establishing total costs).

Final Report

No general submissions on the allocation of insurance costs were received in response to the Draft Report. However, following further consultation with SunWater, the Authority has concluded that an allocation of bulk insurance costs based solely on HUF is not appropriate (as other than asset utilisation factors are also relevant) and has decided to allocate the cost in the same manner as fixed bulk operations costs (50% HUF and 50% WAE).

On other cost allocation matters, no submissions were received in response to the Draft Report and the Authority has not identified any other grounds to alter its approach. No changes are therefore proposed for the Final Report.

5.6 Summary of Operating Costs

SunWater's proposed operating costs by activity and type are set out in Table 5.11. The Authority's draft and final recommended operating costs are set out in the following tables.

Compared to the Draft Report, the Final Report estimated operating costs take account of:

- (a) an increase in non-direct costs to include the cost of options analyses and consultation with customers on renewals items (\$445,000 for SunWater as a whole) which has been allocated to schemes on the basis of direct labour;
- (b) lower direct operating costs (excluding electricity) reflecting higher efficiency gains; and
- (c) increased electricity costs reflecting a higher increase for 2012-13 compared to the Draft Report.

Taken together, total operating costs are slightly higher since the Draft Report, although they remain lower than SunWater's proposed costs.

Table 5.11: SunWater's Proposed Operating Costs (Real \$'000)

	2012-13	2013-14	2014-15	2015-16	2016-17
Operations					
Labour	170	170	170	170	170
Materials	3	3	3	3	3
Contractors	29	30	30	31	31
Other	153	153	153	153	153
Non-direct	341	354	345	331	324
Preventive Maintenance					
Labour	99	99	99	99	99
Materials	12	12	12	12	12
Contractors	5	5	5	5	5
Other	1	1	1	1	1
Non-direct	195	202	197	189	185
Corrective Maintenance					
Labour	27	27	27	27	27
Materials	25	25	25	26	26
Contractors	15	16	16	16	16
Other	0	0	0	0	0
Non-direct	55	57	56	53	52
Electricity	10	10	11	12	13
Total	1,140	1,164	1,151	1,128	1,117

Note: Totals vary from NSP due to SunWater's revised approach to insurance and electricity, exclusion of revenue offset (which is dealt with in the following chapter), and rounding. The estimates also reflect the most recent information provided by SunWater to the Authority in October 2011. These costs do not include the allocation of Gin Gin channel costs to the bulk system. Source: SunWater (2011ap) and SunWater (2011ao).

Table 5.12: The Authority's Draft Operating Costs (Real \$'000)

	2012-13	2013-14	2014-15	2015-16	2016-17
Operations					
Labour	164	165	166	167	168
Materials	3	3	3	3	3
Contractors	28	29	29	29	29
Other	148	146	145	144	143
Non-direct	332	339	326	308	296
Preventive Maintenance					
Labour	96	96	97	98	98
Materials	11	11	12	12	12
Contractors	5	5	5	5	5
Other	0	0	0	0	0
Non-direct	190	194	186	175	168
Corrective Maintenance					
Labour	26	26	26	27	27
Materials	24	24	24	24	24
Contractors	15	15	15	15	15
Other	0	0	0	0	0
Non-direct	54	55	53	50	48
Electricity	8	8	9	9	10
Total	1,104	1,118	1,096	1,066	1,046

Note: These costs do not include the allocation of Gin Gin channel costs to the bulk system. Source: QCA (2011).

Table 5.13: The Authority's Final Recommended Operating Costs (Real \$'000)

	2012-13	2013-14	2014-15	2015-16	2016-17
Operations					
Labour	164	165	166	167	169
Materials	8	8	8	8	7
Contractors	28	28	28	28	28
Other	143	142	141	140	139
Non-direct	345	352	340	321	308
Preventive Maintenance					
Labour	98	99	100	100	101
Materials	16	16	16	16	16
Contractors	5	5	5	5	5
Other	0	0	0	0	0
Non-direct	198	202	195	184	177
Corrective Maintenance					
Labour	28	28	28	29	29
Materials	25	26	26	26	26
Contractors	14	15	15	15	15
Other	0	0	0	0	0
Non-direct	58	59	57	54	52
Electricity	9	9	10	10	11
Total	1,138	1,154	1,133	1,103	1,081

Note: These costs do not include the allocation of Gin Gin channel costs to the bulk system. Source: QCA (2012).

6. RECOMMENDED PRICES

6.1 Background

Ministerial Direction

The Ministerial Direction requires the Authority to recommend SunWater's irrigation prices for water delivered from 22 SunWater bulk water schemes and eight distribution systems and, for relevant schemes, for drainage, drainage diversion and water harvesting.

Prices are to apply from 1 July 2012 to 30 June 2017.

Recommended prices and tariff structures are to provide a revenue stream that allows SunWater to recover:

- (a) prudent and efficient expenditure on renewing and rehabilitating existing assets through a renewals annuity; and
- (b) efficient operational, maintenance and administrative costs to ensure the continuing delivery of water services.

In considering the tariff structures, the Authority is to have regard to the fixed and variable nature of the underlying costs. The Authority is to adopt tariff groups as proposed in SunWater's network service plans and not to investigate additional nodal pricing arrangements.

The Ministerial Direction also requires that:

- (a) where current prices are above the level required to recover prudent and efficient costs, current prices are to be maintained in real terms;
- (b) where cost-reflective prices are above current prices, the Authority must consider recommending price paths to moderate price impacts on irrigators, whilst having regard to SunWater's commercial interests; and
- (c) for certain schemes or segments of schemes [hardship schemes], prices should increase in real terms at a pace consistent with 2006-11 price paths, until such time as the scheme reaches the level required to recover prudent and efficient costs.

Price paths may extend beyond 2012-17, provided the Authority gives its reasons. The Authority must also give its reasons if it does not recommend a price path, where real price increases are recommended by the Authority.

Previous Review

In the 2006-11 price paths, real price increases over the five years were capped at \$10/ML for relevant schemes. The cap applied to the sum of Part A and Part B real prices. In each year of the price path, the prices were indexed by CPI. Interim prices in 2011-12 were increased by CPI with additional increases in some schemes.

For this scheme, prices over 2006-11 were increased by CPI. In 2011-12, prices in this scheme were also increased by CPI.

6.2 Approach to Calculating Prices

Draft Report

In order to calculate SunWater's irrigation prices in accordance with the Ministerial Direction, the Authority has:

- (a) identified the total prudent and efficient costs of the scheme;
- (b) identified the fixed and variable components of total costs;
- (c) allocated the fixed and variable costs to each priority group;
- (d) calculated cost-reflective irrigation prices;
- (e) compared the cost-reflective irrigation prices with current irrigation prices; and
- (f) implemented the Government's pricing policies in recommended irrigation prices.

Submissions Received from Stakeholders on the Draft Report

The ISIS Central Sugar Mill submitted that the Authority had applied a smoothing of forecast costs over a 20 year period which has the effect of inflating the costs within the 2012-17 period that otherwise would be the case. The ISIS Central Sugar Mill requested that the impact of smoothing be removed from the 2012-17 period.

Authority's Response to Submissions Received on the Draft Report

For the Draft Report, the Authority adopted a 20 year price model mainly to promote long term price stability. Under this approach, prices are above costs for the first ten years of the 20 year model and below costs for the last ten years. Over the 20 year period, costs are fully recovered.

Some stakeholders raised concerns about estimated cost reflective prices exceeding lower bound costs over the 2012-17 price period.

In the Final Report, the Authority has adopted a five year pricing model for the purpose of developing prices. The Authority has retained the rolling 20 year renewals annuity planning period and used the relevant five years of the smoothed renewals annuity. For non-renewals costs the five year model now incorporates only five years of such costs, rather than 20 years. Such an approach also has the advantage of removing from prices the inaccuracies associated with longer term forecasts in non-capital costs.

6.3 Total Costs

The Authority's estimate of prudent and efficient total costs for the Bundaberg WSS for the 2012-17 regulatory period is outlined in Table 6.1. Total costs since 2006-07 are also provided. Total costs reflect the costs for the service contract (all sectors) and do not include any adjustments for the Queensland Government's pricing policies.

Table 6.1: Total Costs for the Bundaberg WSS (Real \$'000)

	Actual Costs						Future Costs				
	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
SunWater's Submitted Costs	1,810	1,597	1,480	1,929	2,783	1,705	1,757	1,780	1,766	1,742	1,746
Renewals Annuity	99	397	421	456	668	640	641	640	638	637	637
Operating Costs	1,722	1,217	1,092	1,521	2,105	1,089	1,140	1,164	1,151	1,128	1,117
Revenue Offsets	-10	-17	-33	-49	10	-24	-24	-24	-24	-24	-24
Draft Report											
Authority's Total Costs	-	-	-	-	-	-	1,672	1,686	1,664	1,635	1,622
Renewals	-	-	-	-	-	-	544	544	543	545	553
Operating Costs	-	-	-	-	-	-	1,150	1,165	1,143	1,113	1,092
Revenue Offsets	-	-	-	-	-	-	-24	-24	-24	-24	-24
Return on Working Capital	-	-	-	-	-	-	1	1	1	1	1
Final Report											
Authority's Total Costs	-	-	-	-	-	-	1,661	1,675	1,652	1,623	1,607
Renewals	-	-	-	-	-	-	545	544	541	542	548
Operating Costs	-	-	-	-	-	-	1,138	1,154	1,133	1,103	1,081
Revenue Offsets	-	-	-	-	-	-	-24	-24	-24	-24	-24
Return on Working Capital	-	-	-	-	-	-	1	1	1	1	1

Note: Costs are presented for the total service contract (all sectors). Costs reflect SunWater's latest data provided to the Authority in October 2011 and may differ from the NSP. SunWater's costs do not include the allocation of Gin Gin channel costs to the bulk system (Chapter 3). The Authority's costs do include the adjustment. Source: SunWater (2011ap) Draft Report (QCA, 2011) Final Report (QCA 2012).

6.4 Fixed and Variable Costs

Draft Report

The Ministerial Direction requires the Authority to have regard to the fixed and variable nature of SunWater's costs in recommending tariff structures for each of the irrigation schemes.

SunWater submitted that all of its operating costs are fixed in the Bundaberg WSS.

As noted in Volume 1, the Authority engaged Indec to determine which of SunWater's costs are most likely to vary with water use. Indec identified:

- (a) costs that would be expected to vary with water use. Indec expected that electricity pumping costs would generally be variable and non-direct costs would be fixed;

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- (b) all other activities and expenditure types (costs) would be expected to be semi-variable, including: labour, material, contractor and other direct costs, maintenance, operations and renewals expenditures;
 - (c) costs that actually varied with water use in 2006-11, by activity and by type:
 - (i) by activity, Indec found that operations, preventive and corrective maintenance and renewals were semi-variable. Electricity was generally highly variable with water use in five distribution systems and two bulk schemes. In three distribution systems electricity pumping costs were semi-variable due to gravity feed;
 - (ii) by type, Indec found that labour, materials, contractors and other direct costs were semi-variable. Non-direct costs were fixed;
 - (d) costs that *should* vary with water use under Indec's proposed optimal (prudent and efficient) management approach (as outlined in Volume 1). On average across all SunWater's bulk schemes, Indec considered 93% of costs would be fixed and 7% variable. However Indec proposed that scheme-specific tariff structures should be applied to reflect the relevant scheme costs.

For Bundaberg WSS, Indec recommended 93% of costs should be fixed and 7% variable under optimal management. The Authority notes that this ratio differs from the current tariff structure which reflects the recovery of 52% of costs in the fixed charge and 48% of costs in the volumetric charge.

In general, the Authority accepts Indec's recommended tariff structure, for the reasons outlined in Volume 1. No change is proposed from the Draft Report.

6.5 Allocation of Costs According to WAE Priority

Fixed Costs

The method of allocating fixed costs to priority groups is outlined in Chapter – Renewals Annuity and Chapter 5 – Operating Costs. The outcome is summarised in Table 6.2. These costs are translated into the fixed charge using the relevant WAE for each priority group.

Table 6.2: Allocation of Fixed Costs According to WAE Priority (Real \$'000)

	2012-13	2013-14	2014-15	2015-16	2016-17
Draft Report					
Net Fixed Costs	1,553	1,567	1,546	1,519	1,507
High Priority	195	197	194	191	190
Medium Priority	1,085	1,095	1,080	1,061	1,052
Distribution Losses	273	275	272	267	265
Final Report					
Net Fixed Costs	1,551	1,564	1,541	1,512	1,496
High Priority	87	88	87	85	84
Medium Priority	1,139	1,149	1,132	1,110	1,098
Distribution Losses	257	260	256	249	245

Note: Net fixed costs are net of revenue offsets and return on working capital. Source: SunWater (2011ap), Draft Costs (QCA 2011), Final Report (QCA 2012).

Variable Costs

Draft Report

Volumetric tariffs are calculated based on SunWater's eight-year historical water usage data for all sectors. However, consistent with SunWater's assumed typical year for operating cost forecasts, the Authority has removed from the eight years of data the three lowest water-use years for each service contract.

Stakeholder Submissions Received on the Draft Report

BRIG (2011e) submitted that the levels of use recorded over the 8 year period 2002-10 but excluding 2002-03, 2007-08 and 2008-09 does not reflect the usage expected over the coming price path because:

- (a) storage levels were low for much of the recent past, reducing the level of announced allocation at the start of the water year (1 July). Given the current levels of both Paradise and Fred Haigh dams it is expected that storage levels will be good at the start of the 2012-13 water year.
- (b) the Bundaberg Irrigation Scheme is supplementary in nature with rainfall supplying most of the crop demand. As a result, irrigation water use is only high during dry periods which follow a period of better rainfall, such as currently exists;
- (c) sugar prices were low during much of the eight year period. They are now much higher with the industry now having the ability to lock in prices five years in advance;
- (d) the scheme's largest irrigator used an average of 55% of allocation across the five years used by the Authority in its calculations. Excluding the dry 2006-07 year, the largest irrigator used an average of 57% across the four wetter years; and

- (e) in its NSP, SunWater proposed using a usage level of 50%. It would be expected that SunWater would be very conservative in making this estimate.

BRIG (2011e) believed that 58% would be a more appropriate level of water use on which to base the Part D calculation.

The ISIS Central Sugar Mill submitted that water use for the next five years is likely to be greater than recommended in the Authority's Draft Report. Isis Central Sugar Mill considered that full storages and increased sugar prices are providing incentive to fully utilise irrigation water. Isis Central Sugar Mill submitted that the 60% water usage forecast used during the 2006-11 price path should be utilised as a more accurate estimation of future water usage over the 2012-17 price path.

CANEGROWERS Isis (2011a) submitted that low water use over the last eight years has been contributed to by low announced allocations at the start of the water year and rainfall impacts. CANEGROWERS Isis suggested that when announced allocations are set at low levels at the start of the water year, irrigators are reluctant to commence irrigating until they can be more certain that they will not run out of water. CANEGROWERS Isis suggested that it would be useful to model the beneficial water available rather than simply water used as a percentage of nominal allocations across the whole year.

CANEGROWERS Isis also requested the Authority model 60% water use, as used in the previous 2006-11 price path. To support its request, CANEGROWERS Isis noted that:

- (a) current storage levels are at full supply level;
- (b) improved commodity prices exist for the foreseeable future;
- (c) irrigators are demonstrating a higher level of optimism; and
- (d) climate change (more variability in rainfall).

CANEGROWERS Isis noted that sugarcane growers and millers can now fix prices 3 years forward and at current prices many are doing so. CANEGROWERS Isis therefore argued that water use during the next five years is likely to be at a higher level than the previous five years.

CANEGROWERS Isis also requested that the Authority model the effects of the recommended water prices on water usage.

Authority's Response to Submissions Received on the Draft Report

The Authority notes that its estimates of water use for this purpose are not forecasts, rather they allow variable costs to be converted into a per ML volumetric charge.

As noted in Volume 1, because SunWater's eight-year average (eight years to and including 2009-10) was found to include up to three years of abnormally low water usage (reflecting severe drought and/or flood impacts during this period), the Authority has removed the three lowest-water use years from this eight years of data for each WSS and distribution system. This creates an estimated typical or average all sectors water use year for the exclusive purpose of recommending an all sectors volumetric tariff.

The eight-year average, without the three abnormal years, most closely resembles SunWater's 'typical year' upon which its direct fixed operating costs were estimated (noting SunWater defines its typical year as a year in which climatic extremes, such as flood and drought, do not occur). In this way, and in the absence of a longer (10+ years) period of relevant data, the Authority has generated a meaningful water use denominator.

The Authority uses the variable cost portion consistent with Indec's recommendations and the estimated 'typical' water use ratio to estimate a volumetric tariff for all sectors for the main segments in each WSS and distribution system.

6.6 Cost-Reflective Prices

Cost-reflective prices reflect the Authority's estimates of prudent and efficient costs, recommended tariff structures, and the allocation of costs to different priority groups.

The cost-reflective prices in the Draft Report are contrasted with its Authority's final cost-reflective prices below.

Table 6.3: Medium Priority Prices for the Bundaberg WSS (\$/ML)

	<i>Actual Prices</i>						<i>Cost Reflective Prices</i>				
	<i>2006-07</i>	<i>2007-08</i>	<i>2008-09</i>	<i>2009-10</i>	<i>2010-11</i>	<i>2011-12</i>	<i>2012-13</i>	<i>2013-14</i>	<i>2014-15</i>	<i>2015-16</i>	<i>2016-17</i>
Draft Report											
Fixed (Part A)	6.20	6.36	6.68	6.88	7.08	7.36	5.94	6.09	6.25	6.40	6.56
Volumetric (Part B)	9.66	9.94	10.42	10.75	11.08	11.47	1.10	1.13	1.15	1.18	1.21
Final Report											
Fixed (Part A)	6.20	6.36	6.68	6.88	7.08	7.36	6.35	6.51	6.67	6.84	7.01
Volumetric (Part B)	9.66	9.94	10.42	10.75	11.08	11.47	1.10	1.13	1.16	1.19	1.22

Note: Channel (Bundled) prices are provided for reference only. Source: Actual Prices (SunWater, 2011a) and Draft Cost Reflective Prices (QCA, 2011) and Final Cost-Reflective Prices (QCA, 2012).

6.7 Queensland Government Pricing Policies

As noted above, the Queensland Government has directed that:

- (a) where current prices are above the level required to recover prudent and efficient costs, current prices are to be maintained in real terms;
- (b) where cost-reflective prices are above current prices, the Authority must consider recommending price paths to moderate price impacts on irrigators, whilst having regard to SunWater's commercial interests; and
- (c) for certain schemes or segments of schemes [hardship schemes], prices should increase in real terms at a pace consistent with 2006-11 price paths, until such time as the scheme reaches the level required to recover prudent and efficient costs.

Price paths may extend beyond 2012-17, provided the Authority gives its reasons. The Authority must also give its reasons if it does not recommend a price path, where real price increases are recommended by the Authority.

Authority's Analysis

As noted in the Draft Report, to identify the relevant price path (if any), the Authority first identified whether current prices recover prudent and efficient costs. To do so, given changes to tariff structure, the Authority compared current revenues with revenues that would arise under the cost-reflective tariffs, if implemented (see Volume 1).

The Authority calculated these current revenues using the relevant 2010-11 prices, current irrigation WAE and the five-year average (irrigation only) water use during 2006-11 (Table 6.4). The five year water use has been updated for more reliable data, as outlined in Volume 1.

For this scheme, current revenues are above the level required to recover prudent and efficient costs (Table 6.4). Therefore, the Authority is required to recommend prices that maintain revenues in real terms for the 2012-17 regulatory period.

Table 6.4: Comparison of Current Prices and Cost-Reflective Prices (\$ 2012-13)

Tariff and Priority Group	2010-11 Prices \$/ML (indexed to 2012-13)		Irrigation WAE (ML)	Irrigation Water Use (ML)	Current Revenue	Revenue from Cost-Reflective Tariffs	Difference
	Fixed	Variable					
River (Draft)	7.44	11.64	185,689	66,425	\$2,154,477	\$1,176,756	\$977,722
River (Final)	7.44	11.64	185,689	63,914	\$2,125,252	\$1,249,136	\$876,116

Source: Source: SunWater (2011al), SunWater (2011ao) and QCA (2011 and 2012).

6.8 The Authority's Recommended Prices

The Authority's draft and final recommended prices to apply to the Bundaberg WSS for 2012-17 are outlined in Table 6.5 together with actual prices since 2006-07. In calculating the recommended prices, a 10-year average irrigation water use has been adopted (see Volume 1).

Table 6.5: Recommended Medium Priority Prices for the Bundaberg WSS (\$/ML)

	<i>Actual Prices</i>						<i>Calculated Prices</i>				
	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Draft Report											
Fixed (Part A)	6.20	6.36	6.68	6.88	7.08	7.36	11.14	11.42	11.70	12.00	12.30
Volumetric (Part B)	9.66	9.94	10.42	10.75	11.08	11.47	1.10	1.13	1.16	1.18	1.21
Final Report											
Fixed (Part A)	6.20	6.36	6.68	6.88	7.08	7.36	10.99	11.26	11.55	11.83	12.13
Volumetric (Part B)	9.66	9.94	10.42	10.75	11.08	11.47	1.10	1.13	1.16	1.19	1.22

Source: *Actual Prices (SunWater, 2011a)*, *Draft Recommended Prices (QCA, 2011)* and *Final Recommended Prices (QCA, 2012)*.

6.9 Impact of Recommended Prices

The impact of any change in prices on the total cost of water to a particular irrigator, can only be accurately assessed by taking into account the individual irrigator's water usage and nominal WAE (see Volume 1).

Stakeholder Submissions Received on the Draft Report

During Round 3 consultation, stakeholders queried whether the Authority's model had taken into account how a change in price would affect water use.

CANEGROWERS Isis (2011b) asserted that high water prices will:

- (a) force irrigators to stretch their irrigation rotations in a hope that it will rain, thus saving irrigation costs; and
- (b) hinder investment in infrastructure including the adoption of technological enhancements in irrigation systems.

CANEGROWERS Isis submitted further that the law of diminishing returns is applicable here, where; less water used leads to lower crop yield, which affects irrigators' incomes. Less income affects irrigators' capacity to buy water resulting in lower future yields and less future income.

Authority's Response to Stakeholder Submissions

The Authority's water use assumptions are detailed in Volume 1. The Authority notes that its recommended prices include a transition to cost-reflective prices, as required under the Ministerial Direction. Capacity to pay is outside the Authority's remit.

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APPENDIX A: FUTURE RENEWALS LIST

Below are listed SunWater's forecast renewal expenditure items greater than \$10,000 in value, for the years 2011-12 to 2035-36 in 2010-11 dollar terms.

<i>Asset</i>	<i>Year</i>	<i>Description</i>	<i>Value (\$'000)</i>
Ben Anderson Barrage	2012	Replace Anodes	217
		11BIAXX REFURBISH 10 SHUTTERS	165
		09BIA49 REPLACE SECTION OF CRANE RAIL (complete replacement to be done over 4 years)	39
		10BIA19 DESIGN/INSTALL WEED DEFLECTOR	29
	2013	11BIAXX REFURBISH 10 SHUTTERS	172
		09BIA49 REPLACE SECTION OF CRANE RAIL (final sections after 4 years)	76
		Study: 5yr Dam Comprehensive Inspection	30
		Study: Failure Impact Assessment	15
	2014	11BIAXX REFURBISH 10 SHUTTERS	176
	2015	11BIAXX REFURBISH 10 SHUTTERS	175
	2016	Replace Control	193
		11BIAXX REFURBISH 10 SHUTTERS	173
		Replace Hydraulic Power System	61
	2017	11BIAXX REFURBISH 10 SHUTTERS	171
	2018	11BIAXX REFURBISH 10 SHUTTERS	170
		Study: 5yr Dam Comprehensive Inspection	30
		Study: Failure Impact Assessment	15
	2019	11BIAXX REFURBISH 10 SHUTTERS	171
		10BIA13 COND ASSES AND REFURB OF CP SYST	52
		Refurbish Road - fill potholes, reconstruct table drainage, reseal surface	24
	2020	11BIAXX REFURBISH 10 SHUTTERS	170
		Replace Cables & Cableways	58
		10BIA20 - 10Y CRANE INSPECTION	26
	2021	11BIAXX REFURBISH 10 SHUTTERS	173
	2022	Replace Anodes	226
		11BIAXX REFURBISH 10 SHUTTERS	171
	2023	11BIAXX REFURBISH 10 SHUTTERS	169
		Study: 5yr Dam Comprehensive Inspection	30
		Study: Failure Impact Assessment	14
		Refurbish Seals etc - Gates are Stainless Steel installed April 2005 (BUN731)	12
	2024	Replace Hydraulic Control System	238
		11BIAXX REFURBISH 10 SHUTTERS	170
	2025	11BIAXX REFURBISH 10 SHUTTERS	168
		Refurbish Crane - corrosion treatment, mech/elec/hydraulic refurbishment incl winch	54
		Replace Electric Winch	50
		09BIA49 REPLACE SECTION OF CRANE RAIL	32
	2026	11BIAXX REFURBISH 10 SHUTTERS	168
		Replace Hydraulic Power System	60
	2027	11BIAXX REFURBISH 10 SHUTTERS	169
	2028	11BIAXX REFURBISH 10 SHUTTERS	169
	10BIA13 COND ASSES AND REFURB OF CP SYST	51	
	Study: 5yr Dam Comprehensive Inspection	30	
	Refurbish Gate - corrosion, rope, seals & actuator - moved out from 2005	24	
	Study: Failure Impact Assessment	14	
2029	11BIAXX REFURBISH 10 SHUTTERS	170	
	09BIA46 REFURBISH GATE 2	31	

<i>Asset</i>	<i>Year</i>	<i>Description</i>	<i>Value (\$'000)</i>
		09BIA47 REFURBISH GATE 3	30
	2030	11BIAXX REFURBISH 10 SHUTTERS	168
		10BIA14 REFURBISH GATE	133
		10BIA20 - 10Y CRANE INSPECTION	26
	2031	Replace Control	189
		11BIAXX REFURBISH 10 SHUTTERS	169
		11BIA26 REFURBISH GATE	55
		11BIAXX REPAIR D/S CONCRETE SLAB	28
	2032	Replace Anodes	223
		11BIAXX REFURBISH 10 SHUTTERS	169
		Refurbish Control	36
	2033	Replace Transformer Rectifier Unit, Seaford	208
		11BIAXX REFURBISH 10 SHUTTERS	169
		Study: 5yr Dam Comprehensive Inspection	30
		Refurbish Road - fill potholes, reconstruct table drainage, reseal surface	24
		Study: Failure Impact Assessment	14
	2034	11BIAXX REFURBISH 10 SHUTTERS	169
	2035	11BIAXX REFURBISH 10 SHUTTERS	169
	2036	11BIAXX REINSTATE ROCKFILL	200
		11BIAXX REFURBISH 10 SHUTTERS	169
		Replace Hydraulic Power System	60
		09BIA49 REPLACE SECTION OF RAIL	33
Bucca Weir	2024	Replace BUOYS (5 OFF), SAFETY BUOYAGE SYSTEMS	24
	2026	Refurbish: Baulks which were installed in 2005.	36
	2034	Replace Splitters	32
Burnett River Distribution	2017	Replace Gauging Equipment	14
	2020	Replace Recorder	36
	2029	Replace Burnett River Meter Outlets	12
	2032	Replace Gauging Equipment	14
	2035	Replace Recorder	35
Fred Haigh Dam	2012	Study: 5yr Dam Comprehensive Inspection (by 1 Sep 2011)	94
		Replace Instrumentation	59
		Refurbish Cne - rope, corrosion etc	23
		Refurbish Door - cannot remove, refurbish insitu, work in confined space difficult redesign and construct modified lifting	23
		Remove rocks from spillway floor and pli	16
		Remove rocks from spillway floor and pli	12
	2013	Refurbish Trash Racks - patch paint & annodes	36
		Study: Options analysis and condition assessment on cable replacement and cable outlet works etc	24
	2014	Replace Cable Main Wall	310
	2015	Replace Cable Main Wall	309
	2016	Refurbish Valve	31
		Refurbish Valve - 751 cone patch painting - carried out Jan 03	27
	2017	Study: 5yr Dam Comprehensive Inspection (by 1 Sep 2011)	98
		Refurbish Valve - manual actuation	37
		Remove rocks from spillway floor and pli	13
	2018	Refurbish Trash Racks - patch paint & annodes	36
		Refurbish Valve - manual actuation incl. Insertion piece	36
	2019	Replace Cable Inlet Tower	46
	2020	Study: 20yr Dam Safety Review (by 1 Sep 2019)	121
		Refurbish Metal Work - handrails & barriers (gal)	61
		10BIA03 - 10Y CRANE INSPECTION	34
	2021	Refurbish Actuator - replace Rotork	49

<i>Asset</i>	<i>Year</i>	<i>Description</i>	<i>Value (\$'000)</i>
	2022	Study: 5yr Dam Comprehensive Inspection (by 1 Sep 2011)	98
		Remove rocks from spillway floor and pli	13
	2023	Refurbish Trash Racks - patch paint & annodes	36
		Refurb valve - 2006 DS Report Rec 6.1a	24
	2027	Study: 5yr Dam Comprehensive Inspection (by 1 Sep 2011)	97
		Replace Instrumentation	60
		Remove rocks from spillway floor and pli	13
	2028	Refurbish Trash Racks - patch paint & annodes	36
	2030	10BIA03 - 10Y CRANE INSPECTION	34
		Blast to remove existing coating and repaint gate with an approved APAS coating.	20
		10BIA02 RECOAT GATE WITH AN APP COATING	18
	2031	11BIAXX REFURBISH BULKHEAD GATES	49
		Refurbish Valve	30
		11BIAXX REFURBISH VALVE	22
	2032	Study: 5yr Dam Comprehensive Inspection (by 1 Sep 2011)	97
		Refurbish Valve - manual actuation	36
		Refurbish Cne - rope, corrosion etc	24
		Refurbish Door - cannot remove, refurbish insitu, work in confined space difficult	24
		Remove rocks from spillway floor and pli	13
	2033	Refurbish Trash Racks - patch paint & annodes	36
		Refurbish Valve - manual actuation incl. Insertion piece	36
		Investigate and implement replacement of fishing gear for removal of bhk gates/trks DS Report Rec. ES/OM Pro	30
	2035	Refurbish Metal Work - handrails & barriers (gal)	30
	2036	Replace Guardrail (Upstream)	147
		Replace Guardrail	79
		Replace Guardrails & Handrails	29
		Refurbish Valve - 751 cone patch painting - carried out Jan 03	27
Kolan Barrage	2016	11BIA22 5Y COMPREHENSIVE INSPECTION	10
	2021	11BIA22 5Y COMPREHENSIVE INSPECTION	10
	2024	Replace BUOYS (7 OFF), SAFETY BUOYAGE SYSTEMS	34
		Replace Fishway Gate	27
		Replace Trash Racks	15
	2032	June 2005 5 Yearly Barrage Safety Inspection - Recomm 8) Fill holes in concreted rock fill.	24
Kolan River Distribution	2021	Replace Head Water Level Recorder	17
	2036	Replace Head Water Level Recorder	17
Ned Churchward Weir	2012	10BIA11 REFURBISH U/S L/B SHEET PILING	119
		10Y CRANE INSPECTION - as per AS2550	12
	2013	Replace 450 Dia Supply Line Valve	32
	2015	Change Out Cntl - electronics & SCADA software	62
	2016	Refurbish screens 1 and 2 - hydraulics, coating etc	25
		11BIAXX 5Y COMPREHENSIVE INSPECTION	11
	2017	Refurbish Hydraulics - constant use, pumps, motors brought forward from 2009	24
	2018	Refurbish Hoist - mech, elec, change rope, corrosion control as required	18
	2019	Maintain access road - grade, gravel replacement, drainage, road furniture. Brought forward from 2009.	24
	2020	Replace Exit/Ent Upper & Lwr Fish Trap	74
		Refurbish Baulks - paint & annodes, seals	73
		Replace Holding Chamber Fish Trap	70
		10BIA16 REFURBISH VALVE - SEALS	59
		Change Out PLC - obsolescence	49
		Refurbish Gate - paint & annodes, seals	36

<i>Asset</i>	<i>Year</i>	<i>Description</i>	<i>Value (\$'000)</i>
		Refurbish Baulk - paint & annodes, seals	18
		Refurbish Valve - seals, corrosion - Remove?	18
	2021	Refurbish Baulks - paint & annodes, seals	104
		Refurbish Gate - paint & annodes, seals	31
		Refurbish Baulk - paint & annodes, seals	25
		11BIAXX 5Y COMPREHENSIVE INSPECTION	11
	2022	10Y CRANE INSPECTION - as per AS2550	12
	2024	Replace Pump, Submersible	35
		Refurbish Gate - Corrosion (anaerobic) - requirement unknown	24
	2025	Refurbish Gate - Corrosion (anaerobic) - requirement unknown	24
	2026	Refurbish Hoist - mech, elec, change rope, corrosion control as required	18
		11BIAXX 5Y COMPREHENSIVE INSPECTION	10
	2028	Refurbish screens 1 and 2 - hydraulics, coating etc	24
	2030	10BIA16 REFURBISH VALVE - SEALS	59
		Refurbish Bld - paint, fixtures & fittings, house services as required	12
	2031	11BIAXX 5Y COMPREHENSIVE INSPECTION	10
	2032	10Y CRANE INSPECTION - as per AS2550	12
	2033	Maintain access road - grade, gravel replacement, drainage, road furniture. Brought forward from 2009.	24
		Refurbish Valve - seals, corrosion - Remove?	18
	2034	Replace Electrical Cabling	296
		Refurbish Gate - Corrosion (anaerobic) - requirement unknown	24
		Refurbish Hoist - mech, elec, change rope, corrosion control as required	18
	2035	Replace Electro-Hydraulic Cubicle	141
		Replace Main Switchboard	61
		Replace Control Cubicle	57
		Replace Fencing And Gates	34
		Refurbish Gate - Corrosion (anaerobic) - requirement unknown	24
	2036	11BIAXX 5Y COMPREHENSIVE INSPECTION	10