QUEENSLAND COMPETITION AUTHORITY

Draft Report

SunWater
Irrigation Price Review: 2012-17
Volume 2
Three Moon Creek Water Supply Scheme

November 2011

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SUBMISSIONS

This report is a draft only and is subject to revision. Public involvement is an important element of the decision-making processes of the Queensland Competition Authority (the Authority). Therefore submissions are invited from interested parties. The Authority will take account of all submissions received.

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

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The **closing date** for submissions is **23 December 2011**.

Confidentiality

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

While the Authority will endeavour to identify and protect material claimed as confidential as well as exempt information and information disclosure of which would be contrary to the public interest (within the meaning of the *Right to Information Act 2009 (RTI)*), it cannot guarantee that submissions will not be made publicly available. As stated in s187 of the *Queensland Competition Authority Act 1997* (the QCA Act), the Authority must take all reasonable steps to ensure the information is not disclosed without the person's consent, provided the Authority is satisfied that the person's belief is justified and that the disclosure of the information would not be in the public interest. Notwithstanding this, there is a possibility that the Authority may be required to reveal confidential information as a result of a RTI request.

Public access to submissions

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

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

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GLOSSARY

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 (WSS) 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 Three Moon Creek 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 Three Moon Creek WSS ($/ML)

	Actual Prices						*Recommended Prices*				
	2006-07	*2007-08*	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*	*2016-17*
River											
Fixed (Part A)	14.24	16.20	18.60	20.84	23.04	23.88	27.29	27.97	28.67	29.39	30.13
Volumetric (Part B)	10.18	11.57	13.29	14.89	16.46	17.04	4.02	4.12	4.22	4.32	4.43
Groundwater											
Fixed (Part A)	7.24	9.00	11.04	13.08	15.00	15.56	19.21	19.91	20.41	20.92	21.44
Volumetric (Part B)	5.18	6.43	7.89	9 33	10.72	11.11	4.02	4.12	4.22	4.32	4.43

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

Draft Report

Volume 1 of this Draft 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.

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.

Comments on the Draft Report are due by **23 December 2011.** All submissions will be taken into account by the Authority in preparing its Final Report due by 30 April 2012.

1. THREE MOON CREEK WATER SUPPLY SCHEME

1.1 Scheme Description

The Three Moon Creek water supply scheme (WSS) is located near the town of Monto. An overview of the key characteristics of this WSS is provided in Table 1.1.

Table 1.1: Key Scheme Information for the Three Moon Creek WSS

	Three Moon Creek WSS
Business Centre	Biloela
Irrigation Uses of Water	Dairy, piggeries, winter and summer cereal cropping and Lucerne.
Urban water supplies	Towns of Monto and Mulgildie

Source: Synergies Economic Consulting (2010).

The Three Moon Creek WSS has 90 bulk customers. Medium and high priority water access entitlements (WAE) are outlined in Table 1.2. The total medium priority WAE comprises 12,789ML of groundwater WAE and 1,772ML of surface water (river) WAE. The high priority WAE held by the council is also sourced from groundwater.

Table 1.2: Water Access Entitlements

Customer Group	***Irrigation WAE (ML)***	***Total WAE (ML)***
Medium Priority	14,147	14,561
High Priority	0	580
Total	**14,147**	**15,141**

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.

The full supply storage capacity and age of the key infrastructure are detailed in Table 1.3.

Table 1.3: Bulk Water Infrastructure in the Three Moon Creek WSS

Storage Infrastructure	*Capacity (ML)*	*Age (years) 2011*
Cania Dam	88,500	19
Mulgildie Weir	333	59
Avis Weir	250	23
Yaloumbie Weir	143	37
Bazley Weir	75	23
Monto Weir	27	39

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

The characteristics of the bulk water assets are:

(a) Cania Dam consists of an earth and rock fill embankment with an impervious core. The dam has an unlined spillway, located about 1 km to the west of the dam site and normally, water from the dam is released twice a year;

(b) Mulgildie Weir is located approximately 10 km south west of the town of Mulgildie and has been significantly refurbished since it was completed in 1952;

(c) Avis Weir is a recharge weir for nearby irrigation bores and supplies surface water when available such as when water is being released from Cania Dam. Avis Weir is used to intercept inflows from rain or from upstream operational releases to minimise the chance of running water past Abercorn, which is the southern scheme limit. The weir has four rows of cascading sheet piling with selected infill and reinforced concrete (RC) slab covers. The weir's abutments and downstream riverbanks are protected with rock mattresses and rock pitching;

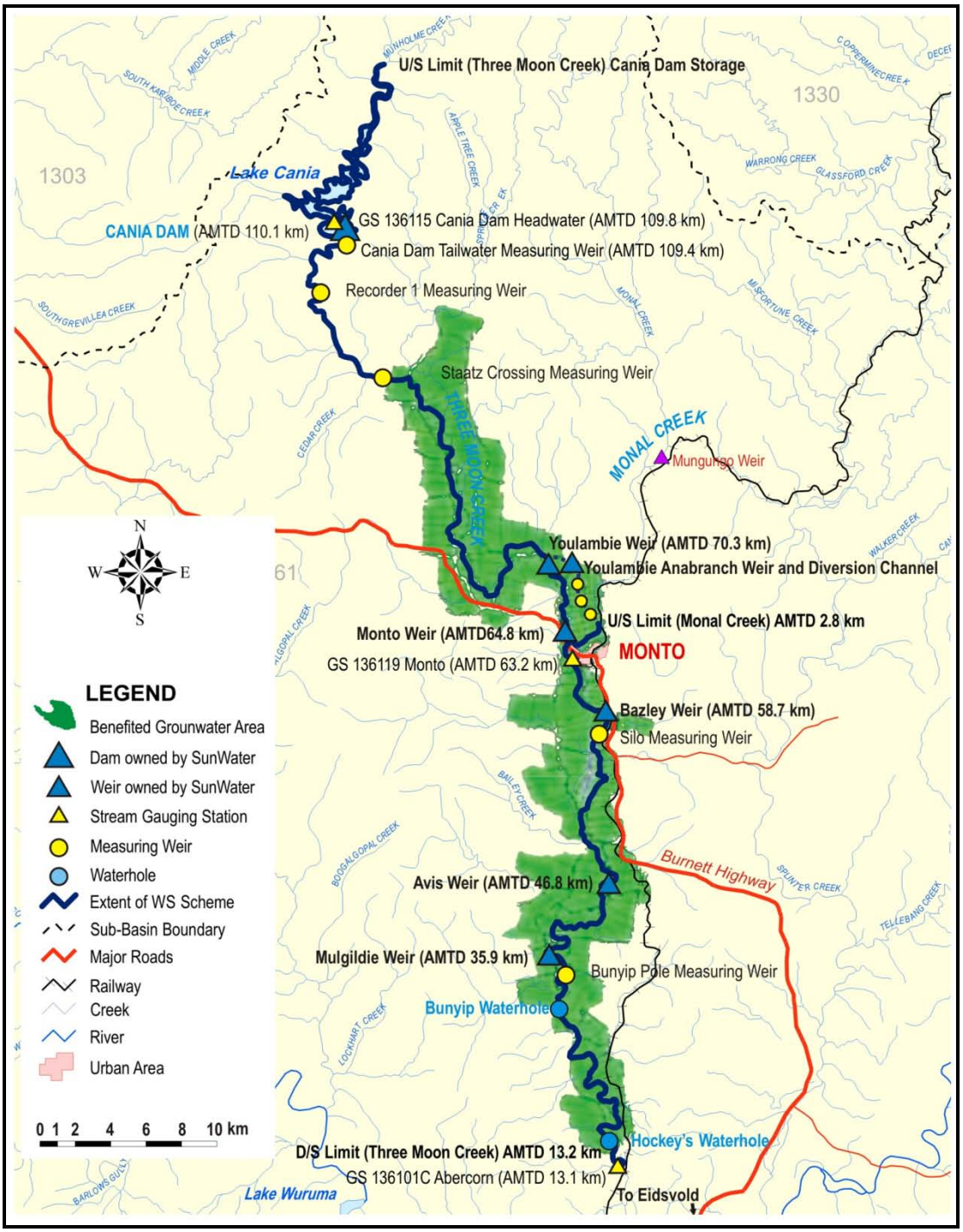
(d) Youlambie Weir consists of three rows of sheet piling with grouted rock infill. Water is diverted from the Youlambie Weir into a channel system to enhance groundwater recharge in the scheme for groundwater WAE;

(e) Bazley Weir is a recharge weir for nearby irrigation bores. It is also used for surface water when sufficient water depth is available such as when water is being released from Cania Dam. The weir consists of three rows of sheet piling with RC infill slabs; and

(f) Monto Weir is used to recharge the groundwater area around the Monto town bores and nearby irrigation bores. The weir consists of a single row of sheet piling with rock mattresses to protect the weir's abutments and downstream banks. The weir does not have an outlet. The weir must be overtopped to pass an inflow or an upstream release.

The location of the Three Moon Creek WSS and key infrastructure is shown in Figure 1.1.

Figure 1.1: Three Moon Creek WSS Locality Map



Source: SunWater (2011).

1.3 Network Service Plans

The Three Moon Creek WSS network service plan (NSP) presents SunWater's:

(a) existing service standards;

(b) forecast operating and renewals costs, 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 consulted extensively with SunWater and other stakeholders throughout this review on the basis of the NSPs and supporting information. 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);

(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; and

(f) considered all submissions and reports in preparing this Draft Report for comment.

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, national metering standards and whether or not to recover recreation management costs from SunWater 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 Three Moon Creek WSS 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 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 Three Moon Creek WSS:

(a) the possible removal of regulated electricity tariffs[1] which could have a significant impact on the cost of electricity;

(b) the introduction of schemes relating to the reduction of greenhouse gases that may have implications for electricity prices;

(c) damage to SunWater's assets, to the extent that such damage is not recoverable under insurances;

(d) metering costs related to changes in regulatory standards;

(e) levies or charges made in relation to the regulation of irrigation prices by the Authority; and

(f) outbreak of noxious weeds.

2.3 Authority's Analysis

The Authority has, in Volume 1, analysed the general nature of the risks confronting SunWater and recommended that an adjusted price cap apply for all WSSs. The proposed allocation of risks and the means for addressing them are outlined in Table 2.1.

[1] As recommended in: Queensland Competition Authority. *Review of Electricity Pricing and Tariff Structures – Stage 1*. (September 2009). p6.

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

Risk	*Nature of the Risk*	*Allocation of Risk*	*Authority's Recommended Response*
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).

Consistent with the Authority's allocation of risks (Table 2.1), it is proposed that risks identified by SunWater in items (a), (b), (c) and (f) above will be dealt with as 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.

Meter upgrades (d) 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.

3. PRICING FRAMEWORK

3.1 Tariff Structure

Introduction

In the 2006-11 price path, a case was identified for a 70:30 ratio of fixed to variable costs. In the Three Moon Creek WSS, fixed charges were set to recover 70% of revenue and variable charges were set to recover 30% of revenue, given the agreed forecast usage.

In the previous review, Three Moon Creek WSS was identified as a Category 3 Scheme as the Government considered it was too onerous to achieve lower bound during 2006-2011.

Stakeholder Submissions

SunWater

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

Other Stakeholders

During Round 2 consultation in April 2011, stakeholders submitted that:

(a) the Part B tariffs cannot be changed because water usage is only about 50% of the WAE; and

(b) paying fixed costs sends wrong signals for water use efficiency.

P Francis and M Francis (2011) raised their concern about the implications of a high Part A tariff given the reliability of supply. They submitted that shifting the scheme to a high Part A tariff will be difficult to implement given that:

(a) water resource planning to clarify entitlement reliability, seasonal allocation rules and trading arrangements is unlikely to be completed until possibly two years into the new price path;

(b) irrigation farms are not geared to pay high up front charges for water; and

(c) high fixed charges are likely to work against efforts to efficiently manage the use of water to return the scheme to a sustainable level of use of the aquifers.

During Round 1 consultation in May 2010, stakeholders submitted that there is a need to investigate the impact of the difference between notional and actual water allocations. In addition, they suggested that the guidelines for water allocation be reviewed.

Authority's Analysis

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.

In response to submissions regarding water use efficiency, it is noted that the Authority recommended tariff structure promotes efficiency 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;

(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.

Under the current legislative and contractual framework, SunWater has an obligation to supply existing customers with water demanded by customers within the amount available under the announced allocation (consistent with the terms and conditions of the specified level of service agreement). SunWater is entitled to recoup all costs of meeting its obligations even in dry years (these being fixed costs). Those costs which vary with water delivery will vary with delivery (these being the variable costs).

The recommended tariff structure should also ensure more stable revenue for the long term operation of the scheme.

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 the Three Moon Creek WSS are identified in Table 3.1.

Table 3.1: Volume of Water Traded in Three Moon Creek WSS (ML)

	2002-03	*2003-04*	*2004-05*	*2005-06*	*2006-07*	*2007-08*	*2008-09*	*2009-10*
Permanent	0	0	0	0	0	0	0	0
Temporary	649	390	757	397	601	126	123	125

Source: SunWater (2003 - 2010g) and Queensland Valuation Services (2010).

The Authority's analysis of whether service delivery costs are fixed or variable is addressed in a subsequent chapter as is cost allocation.

The Authority notes that the relevant ROP and Water Asset Management Plan (WAMP) which will impact future water allocations and availability are yet to be finalised. The nature of any changes and their implications for prices are outside the scope of the current pricing review.

3.2 Water Use Forecasts

Introduction

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

In the previous review, up to 25 years of historical data was collated for nominal 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 Three Moon Creek WSS, SunWater (2006b) assumed a water usage forecast of 60% of WAE in the river system. 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 Interim Resource Operations Licence (IROL).

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 WAE also hold medium priority WAE which passes through the same meter.

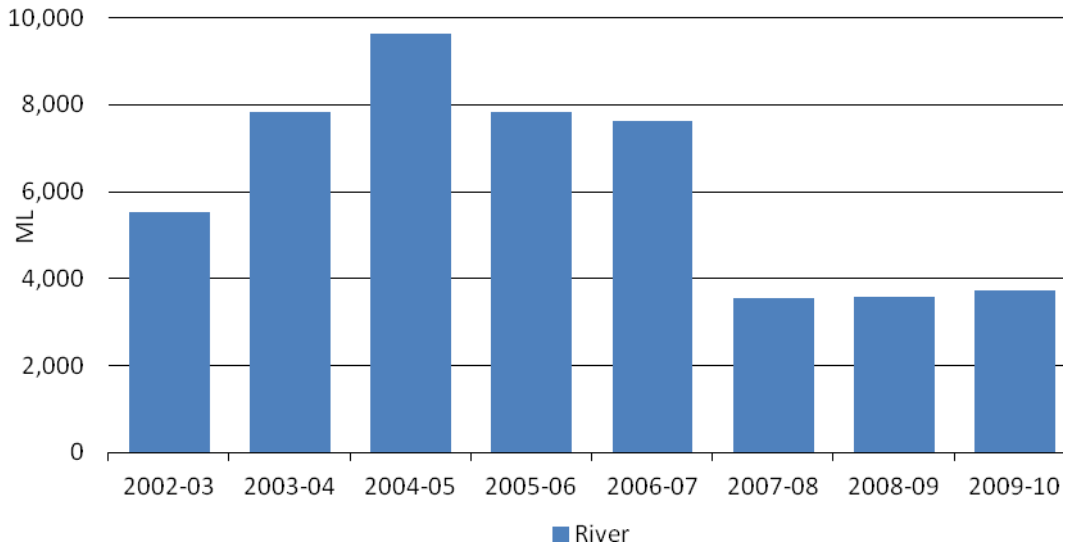
Based on the last eight years observations, SunWater has forecast use as follows:

(a) at a whole scheme level (all sectors) – an average of 41% of total WAE, (including SunWater's distribution loss WAE and its other WAE); and

(b) for the irrigation sector only – an average of 42% of irrigation WAE. This compares with the use assumption adopted in the 2006 price paths of 60% of WAE.

Figure 3.1 shows the historic usage information for the Three Moon Creek submitted by SunWater (SunWater, 2011). The river category includes all irrigation and other usage sourced from the river.

Figure 3.1: Water Usage for the Three Moon Creek WSS



Source: SunWater (2011).

Other Stakeholders

During Round 2 consultation in April 2011, stakeholders submitted that:

(a) the year 2008 was a dry year, however SunWater costs do not reflect this;

(b) diversion channels have not had much rain in the last three years, therefore lesser water;

(c) surface water has poor reliability in the area because water is mostly groundwater; and

(d) SunWater's promise of water delivery does not always eventuate and irrigators pay regardless.

R Roth (2011) submitted that:

(a) although Cania Dam is now full, this is not an indication of its continued reliability. This is because for the last 29 years since Cania Dam was built, it has only spilled for the first time in December 2010. The quantity of water in the dam determines the amount of water, if any, that is released for surface water irrigation or the recharge of the underground. If the underground is recharged, groundwater becomes available for later use at a more expensive option. Most irrigators use surface water if there is some water released from Cania Dam;

(b) often the timing of water release into Three Moon Creek is not suitable to surface water irrigators. An early July release of water is generally too late to plant a winter crop and too early to plant a summer crop; and

(c) irrigators can never be sure as to when surface water will be available for their use even though they are informed of the commencement date, the quantity to be released, and the expected shut off date.

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.

Nonetheless, the Authority has considered past water use in calculating cost-reflective volumetric charges that recover variable costs (see Chapter 6 – Draft 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 (see Chapter 6 – Draft 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 (2006b) nominated two tariff groups for the river segment of the Three Moon Creek WSS:

(a) River; and

(b) Groundwater.

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

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

3.4 Tariff Differentials – Groundwater and River

At the time of the 2006-11 review, the groundwater tariff was half of the river tariff. However, the lower bound costs were the same for both groups.

As noted previously, the Three Moon Creek WSS was identified as a Category 3 Scheme as the Government considered it was too onerous to achieve lower bound during 2007-2011. Over the 2006-11 period, each tariff was increased by $2.50 per year (in real dollar terms) and by $2.25 in 2010-11[2]. In 2010-11, the groundwater tariff was 65% of the river tariff.

The 2010-11 prices were rolled forward by consumer price index (CPI) for 2011-12 interim prices. As a result, in 2011/12 the groundwater tariff remains at 65% of the total river tariff.

Submissions

SunWater

SunWater's NSP did not provide any basis for the differentiated tariffs.

[2] The sum of the Part A and Part B components was increased by $2.50, in real terms.

In a later submission, SunWater advised that the basis for the groundwater discount was assumed to be the higher cost to the irrigator to access groundwater compared to surface water. The current price differences arise as a result of the different starting point for each tariff in 2005-06 and the capped increases to tariffs reaching lower bound cost recovery.

SunWater noted there was no cost data required or available to differentiate these tariff groups, as there is no cost difference in their supply (as recognised in the previous price review).

Other Stakeholders

P Francis and M Francis (2011) submitted that the Authority should take account of the implications of the State Government's recognition of Category 3 schemes.

Authority's Analysis

In the Three Moon Creek WSS, groundwater irrigation WAE accounts for 12,789ML while there is only 1,772ML of river WAE. A further 580ML of high priority groundwater WAE is provided for urban use.

SunWater has advised there is no difference in the cost of supplying groundwater and river WAE. Thus, under purely cost-reflective pricing, there would be no difference in price. Irrigators' costs are not relevant for SunWater prices, which should signal and reflect SunWater's costs in order to achieve efficient outcomes.

In other groundwater schemes, such as the Giru Benefited Groundwater Area in the Burdekin-Haughton WSS, there is a hydrological basis for such price differentials. That is, natural recharge of the aquifers is recognised as contributing a proportion of available supplies. In these cases, only a proportion of WAE is provided by SunWater infrastructure, with the remainder by natural recharge, resulting in lower costs per ML of supply. However, the Authority has not found any evidence that the historic price discount reflected the effect of natural recharge to the groundwater area in Three Moon Creek WSS.

The Authority considers that there is no basis to differentiate costs between groundwater and river WAE, and has proceeded on the basis that the scheme has a single cost category.

However, where price increases are required to reach lower bound in both tariff groups, and there are constraints on price transitioning, the legacy price differential is likely to remain in place. Under the Ministerial Direction, irrigation prices in Three Moon Creek are required to increase in real terms at a pace consistent with the previous price path or until cost recovery is achieved (See Chapter 6 – Draft Prices).

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).

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); and

  (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 prudency and efficiency of SunWater's forecast renewals expenditure;

(c) the methodology for apportioning 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, to assess the prudency and efficiency of every individual asset.

The Authority initially relied on its four principal scheme consultants: Arup, Aurecon, GHD and Halcrow to identify and comment upon 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 5% 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 prudency 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 Three Moon Creek WSS was negative $390,000.

In Volume 1, the Authority noted that the opening ARR balance in 1 July 2006 is not subject to review for the 2012-17 regulatory period.

4.3 Past Renewals Expenditure

As noted in Volume 1, the Authority has reviewed the prudency 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 Three Moon Creek 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*
Past (Actual) Renewals Expenditure	1	51	59	31	9

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

Other Stakeholders

During Round 2 consultation in April 2011, stakeholders stated that:

(a) they wanted to understand the background regarding the 2008 renewals expenditure; and

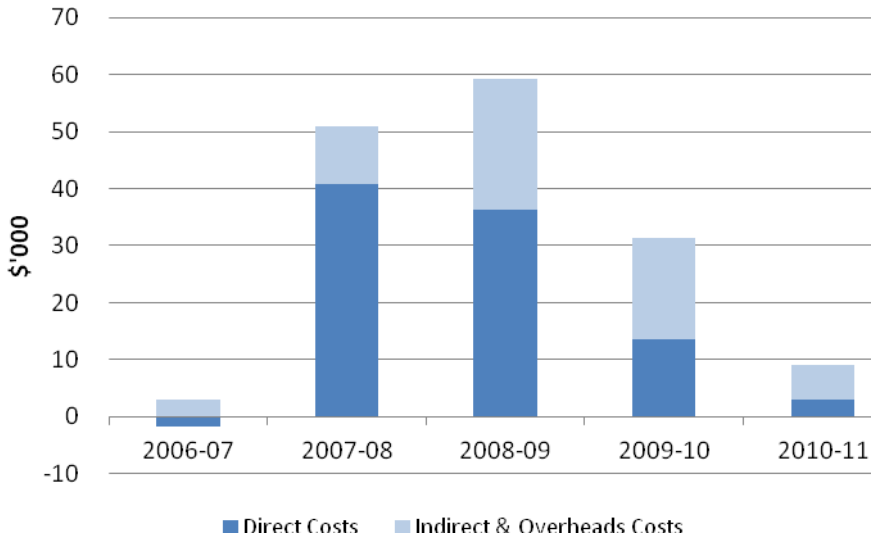
(b) smaller schemes are not necessarily efficient because they have lower costs.

Authority's Analysis

Total Renewals Expenditure

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

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



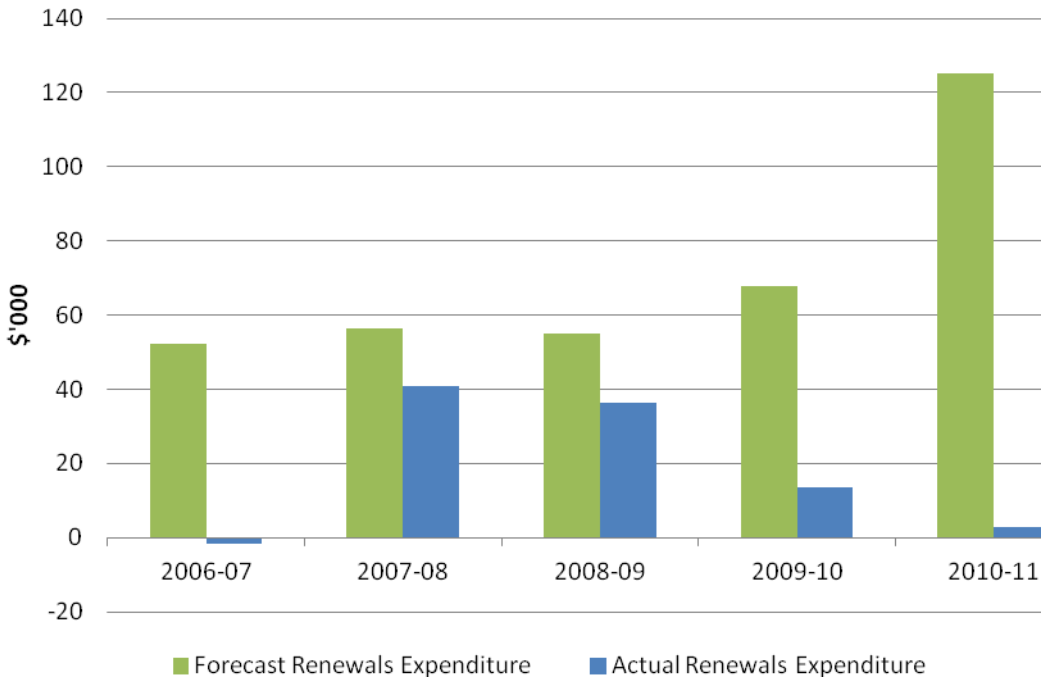
Note: The estimates reflect the most recent information provided by SunWater to the Authority in September 2011.
Source: SunWater (2011an).

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 Three Moon Creek 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: SunWater (2011an).

Actual direct renewals expenditure was $264,911 below that forecast over the period.

Halcrow was appointed to review the efficiency (and prudency where not previously approved) of past renewals expenditure items.

In the absence of forecast renewals expenditure for 2006-11 from SunWater (at the time of Halcrow's review), Halcrow sought to identify variances between annually budgeted and actual expenditure for certain items.

Halcrow stated that a number of items significantly exceeded the original budget, or were not originally budgeted. Halcrow also commented on selected expenditure items as follows:

(a) Cania Dam Inlet Tower – install missing links on safety rail system ($21,179 in 2007-08). Halcrow noted that the maintenance of the safety railing is required for occupational health and safety (OHS) compliance and the cost in part reflects the need to undertake work over water;

(b) Inspection – Five Year Dam Safety – Cania Dam ($42,354 versus budget of $30,825 in 2008-09 and $23,219 versus budget of $18,000 in 2009-10). SunWater noted that actual expenditure was greater than budgeted expenditure as SunWater's Chief Engineer was included in the inspection teams to update his knowledge of the dam portfolio to be able

to respond in an emergency situation. Halcrow noted that at a total of approximately $65,000, the cost of the review is consistent with other Five Year Dam Safety Reviews;

(c) Peer Review Comprehensive Risk Assessment – Cania Dam ($26,064 in 2009-10; item not included in original Board approved budget). SunWater's comprehensive risk assessment program has been in place since 2006. SunWater noted that its Board changed the methodology adopted for the risk assessment to include an external peer review, which resulted in increased costs and some delays to the program. Halcrow considered that the expenditure is in line with normal expectations.

Halcrow also noted significant expenditure in 2010-11 to replace switchboards 2 (Hydraulic) and 3 at the Cania Dam (of $21,542) and to complete an asbestos audit on the scheme and remove some (of $11,921).

Due to information deficiencies Halcrow was unable to conclude on the prudency and efficiency of past renewals expenditure.

Conclusion

The Authority notes Halcrow's finding that there was insufficient information to review the past renewals expenditure items for this scheme. As noted in Volume 1, the Authority has applied a 10% saving to non-sampled and sampled items for which there was insufficient information.

In total, the Authority recommends that past renewals expenditure be adjusted as shown in Table 4.2.

Table 4.2: Review of Past (Direct) Renewals Expenditure 2006-11

Item	*Date*	*SunWater*	*Authority's Findings*	*Recommended*
Past Renewals Items	Various	Various	Insufficient Information	10% savings applied

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

4.4 Opening ARR Balance (at 1 July 2012)

Stakeholder Submissions

SunWater

SunWater indicated that the renewals opening ARR balance as at 1 July 2011 was negative $254,000 for the Three Moon Creek WSS. This estimate reflects the most recent information provided by SunWater to the Authority in September 2011 and may differ from the NSP.

Other Stakeholders

During Round 2 consultation in April 2011, stakeholders requested an explanation as to why the scheme is in negative balance and for how long this has been the case.

P Francis and M Francis (2011) noted that the Three Moon Creek WSS has a significant ongoing negative renewals balance and questioned the cause of the current negative balance.

Authority's Analysis

Based on the Authority's assessment of the prudency and efficiency of past renewals expenditure, the recommended opening ARR balance for 1 July 2011 for Three Moon Creek is negative $244,000.

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

(a) adopting the opening balance as at 1 July 2006;

(b) adding 2006-11 renewals annuity revenue;

(c) subtracting 2006-11 renewals expenditure; and

(d) adjusting interest over the period consistent with the Authority's recommendations detailed in Volume 1.

To establish the closing ARR balance as at 30 June 2012 of negative $270,000, 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 stakeholder submissions, the Authority notes that the Three Moon Creek WSS has a negative opening balance as annuity revenues have not enabled the ARR to regain a positive balance over the 2006-11 period.[3]

However, it is noted that the 2010-11 opening balance has improved since 2005-06. As noted above, forecast expenditure has fallen well below that originally forecast and therefore the opening balance as at 1 July 2011 is not as negative as would have otherwise occurred.

4.5 Forecast Renewals Expenditure

Planning Methodology

The Authority has reviewed SunWater's Asset Management Planning Methodology in Volume 1 and recommended improvements to their 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 expenditure being defined as one which accounts for 10% or more in present value terms of total forecast renewals expenditure; and

(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.

[3] The Authority does not have information from the previous pricing review on the original forecast of the closing ARR balance as at 30 June 2011. Nonetheless, the Authority notes that a negative ARR balance is not necessarily an unexpected result. It will occur in schemes where the pattern of renewals expenditure is front-loaded, such that renewals expenditure is larger than annuity revenue in the earlier years.

Prudency and Efficiency of Forecast Renewals Expenditure

Submissions

SunWater

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

Table 4.3: Forecast Renewals Expenditure 2012-16 (Real $'000)

Facility	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*
Avis Weir	-	16	22	-	-
Bazley Weir	-	-	6	-	-
Cania Dam	94	23	99	80	-
Mulgildie Weir	22	-	-	25	-
Service Contract	-	-	-	6	-
Three Moon Creek Ground Water Dist	1	9	-	-	-
Youlambie Recharge Weir	-	11	-	12	-
Total	**117**	**58**	**127**	**124**	**0**

Note: Includes indirect and overhead costs. Source: SunWater (2011).

The major expenditure items incorporated in the above estimates are Cania Dam refurbishment costs of $296,000 for ladders, platforms, valves and pipework to be incurred from 2011-12 to 2014-15.

The major expenditure items from 2016-17 are:

(a) replace cables and cableways at Cania Dam at an estimated cost of $309,000 in 2017-18; and

(b) conduct 20-year dam safety review at Cania Dam at an estimated cost of $121,000 in 2019-20.

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

R Roth (2011) submitted that it is unlikely that the major asset of the scheme would be replaced once it has reached its use by date and thus no revenue stream should be charged to recover replacement costs.

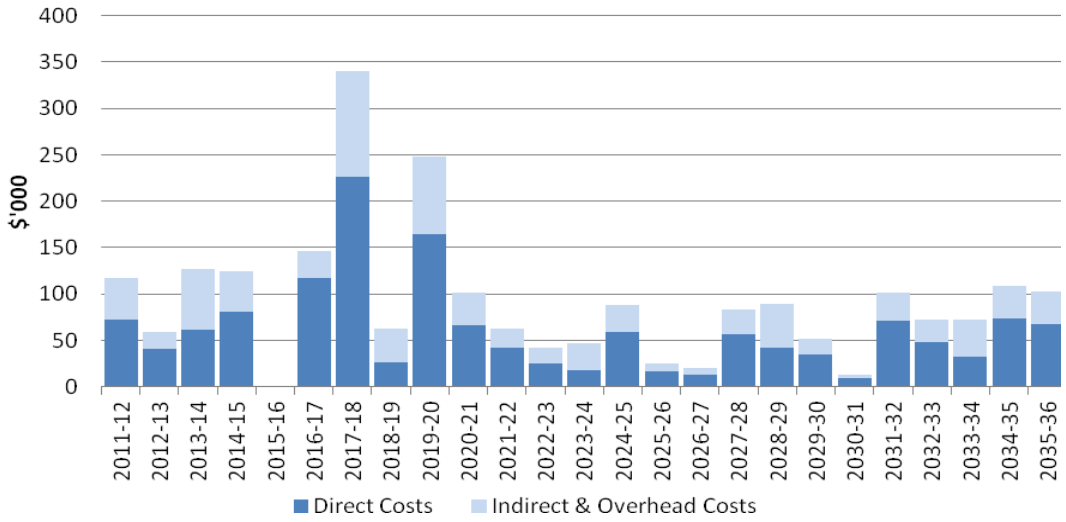
P Francis and M Francis (2011) stated that the data available for analysis of the scheme is totally inadequate for the consultant to provide a full analysis of prudency and efficiency.

Authority's Analysis

Total Costs

SunWater's proposed renewals expenditure for 2011-36 for the Three Moon Creek 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 is reviewed in Chapter 5 – Operating Costs.

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



Source: SunWater (2011am).

In response to stakeholder submissions, the Authority notes that under the prevailing legislative framework and contractual arrangements, SunWater has an obligation to supply existing customers with water under the announced allocation (consistent with the terms and conditions of the specified level of service agreement). SunWater is entitled to recoup all the costs of meeting its obligations even in dry years (these being fixed costs). Those costs which vary with water delivery will vary with delivery (these being the variable costs).

The Authority also notes that renewals annuity is designed to maintain the service potential of the asset, and for major assets such as dams, the annuity does not typically provide for full replacement, but for periodic refurbishments.

In relation to information adequacy, the Authority accepts that SunWater's forecasts will be less detailed and less reliable for expenditure into the long term future. The Authority's consultants have assessed all information made available to them by SunWater to determine the prudency and efficiency of renewals expenditure.

Item Reviews

Halcrow reviewed the prudency and efficiency for a sample of items. The Authority also requested that SKM review an item for this scheme.

Each of the assessed future renewals items are discussed below.

Item 1: LBT/1 12TMC03-Refurbishment of Ladders & Platforms-Inlet Structure

SunWater

This renewals item is scheduled to occur in 2011-12 at a cost of $20,000 ($11,000 direct cost). It involves the refurbishment of ladders, hand rails and a fall arrest system that have been in operation on the inlet structure at Cania Dam since 1982.

Other Stakeholders

No other stakeholders have commented on this item.

Consultant's Review

Halcrow noted that the most recent condition assessment of the assets undertaken in November 2008 showed moderate deterioration with minor refurbishment required to ensure ongoing reliable operations.

Further, Halcrow considered that as SunWater is required to maintain ongoing safe working environments and the condition assessment supports expenditure proposed in 2011-12, the expenditure is therefore both prudent and efficient.

Authority's Analysis

The Authority accepts Halcrow's recommendation that the item is both prudent and efficient.

Item 2: LBT/2 12TMCXX Refurbish Pipework - Interior/Exterior Paint

SunWater

This renewals item is scheduled for 2011-12 at a cost of $48,000 ($33,000 direct cost). It involves the refurbishment of the internal and external paintwork on pipes at the outlet works excluding the Town Water Supply.

Other Stakeholders

No other stakeholders have commented on this item.

Consultant's Review

Halcrow noted that the most recent condition assessment undertaken in December 2008 indicated minor defects only. Halcrow also stated that no assessment was made of the interior of the pipe in 2007-08. However, in a condition assessment undertaken in February 2004, the interior of the pipe was recorded as 'perfect as new condition'.

Halcrow also stated that:

(a) it would be practical to undertake internal and external coating of the pipework at the same time;

(b) given that there had been some deterioration of the external coating at the time of the 2008 inspection, external coating in 2011-12 is likely to be appropriate; and

(c) given that there has (apparently) been no internal inspection since 2004, coupled with the fact that the reservoir has now filled and the outlet works operational, it is not unreasonable to expect that there has been some deterioration of the internal coating.

In view of the above comments, Halcrow advised that it is considered prudent to plan for refurbishment in 2011-12 as is proposed. It is assumed that a further assessment of condition will be undertaken when the pipework is dewatered, and a decision in respect of the need for internal recoating taken at that time.

Halcrow also considered that the expenditure appeared to be efficient.

Authority's Analysis

The Authority accepts Halcrow's recommendation that the item is both prudent and efficient.

Item 3: LBT/3 09 TMC-STUDY: 5 Year Dam Safety

SunWater

Cania Dam is classified as a referable dam under the *Water Act 2000*. Expenditure of $43,000 ($15,000 direct) has been scheduled into the renewals program every five years from 2014-15.

Other Stakeholders

No other stakeholders have commented on this item.

Consultant's Review

Halcrow noted that the most recent five-year Dam Safety report was completed in 2009-10. The work was completed over two years at a total cost of $65,000 (nominal) including indirect and overhead costs.

Halcrow considered the expenditure to be prudent given the statutory requirements for dam safety reporting. With regards to efficiency, Halcrow considered that the direct cost of $15,000 is efficient, although a slightly higher allowance of $20,000 (direct costs) may well be justified given the cost of other five-yearly dam safety reviews.

Authority's Analysis

The Authority accepts Halcrow's recommendation that the item is both prudent and efficient.

Item 4: LBT/4 Replace Cables & Cableways

SunWater

This renewals item is scheduled for 2017-18 at a cost of $309,000 ($206,000 direct costs).

The electrical cables and cableways have been in operation at Cania Dam since 1982 and were installed as part of the original construction works of the dam. An asset life of 35 years has been assigned to these assets, with the cables and cableways scheduled for replacement in 2017-18.

Other Stakeholders

No other stakeholders have commented on this item.

Consultant's Review

Halcrow

Halcrow stated that it was not provided with the exact location and dimensions of the cabling and cableways.

Further, Halcrow noted that the most recent condition assessment undertaken in September 2004 indicated that the cabling was in a perfect as new condition. A risk assessment undertaken in 2005 concluded that failure of the cables and cableways would have minor to insignificant consequences associated with workplace health and safety (WHS), environment, financial, production/operations and stakeholder relations. Overall risks in all categories were rated as low.

Halcrow also stated that SunWater's asset management hierarchy did not provide any further details on cabling and cableways asset lives. SunWater's electrical assets guide recommended, however, that cables resistance measurements and visual inspections should be undertaken at a maximum interval of five years. Cableways should also be visually inspected every five years.

Halcrow considered that while there was no evidence of monitoring of resistivity and that a condition assessment had not recently been conducted, programming for replacement on the basis of asset life was considered prudent. In the absence of more detailed information, however, Halcrow was unable to assess whether the expenditure is efficient.

SKM

SKM reviewed information relating to this item by assessing and viewing information recorded in SunWater's Systems, Applications and Products (SAP) Works Management System (WMS) for the main elements of the item (including indirect costs) to the value of $254,414. This compares to a total cost of $309,000 identified in the NSP for this item.

Available Information

In particular, SKM have drawn on the following Annuity Item specific replacement/refurbishment report produced by SunWater for this review.

Table 4.4: Documentation Reviewed Specific to Replacement of the LV Underground Cable at Cania Dam

Document No.	*Document Name*	*Document Title*	*Date*
1108611	1108611-QCA Justification H24 – Cania Dam – Replace Cable and Cableways	Three Moon Creek Water Supply – Cania Dam – Replace Cables and Cableways (TMC-CNIA-ELEC-CBLE)	6th August 2011

Source: SKM (2011).

Prudency Review

(a) Asset Replacement/Refurbishment Date Determination

SKM considered that SunWater largely followed the policies and procedures it has in place to determine annuity item replacement/refurbishment dates and costs.

SKM stated that the standard object type (asset type) for this infrastructure is CALVAG – Low Voltage (LV) above ground cable. SKM noted that in SunWater's Whole of Life Maintenance Planning Tool (Master), 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 towards the low end of what may be expected for above ground LV 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 noted that SunWater 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 10 resulted in an overall risk score of 80 which, under SunWater's risk assessment method, places this asset in a Low risk category. SKM viewed SunWater's WMS record for this asset and confirmed that it has been allocated a Low risk rating. An overall risk category of Low does 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.

SKM noted that 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.

The last condition assessment was undertaken in 2004. SunWater advised that the condition assessment was out of date and has insufficient information to change from the standard life of 35 years. SKM noted that more than the standard condition assessment period has elapsed since the last assessment and concur with SunWater's evaluation that there is insufficient condition based information to warrant changing the run to failure life of this asset from the standard run to failure asset life for this class of asset and agree with SunWater's decision not to change the replacement year until a new condition assessment is undertaken.

SKM does 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 therefore do not consider that the timing for replacement of 2017-18 to be prudent.

However, and taking a pragmatic approach, SKM considered that it is appropriate to include an annuity item replacement value in this current price setting annuity value as for a 45 year life, the planned replacement date will be 2027-28, that is, within this price reset annuity period.

(b) Options Evaluation

SKM did not view any option analysis for replacement of this item. However, SunWater advised that Cania Dam is scheduled to undergo a comprehensive dam safety inspection during 2013-14, during which time a condition assessment of the cables will occur to refine the scope of works of this item.

Given that the planned replacement date is 2017-18 and that there will be a further price reset prior to 2017-18, SKM considered this approach to be reasonable on the assumption that the 2014 condition assessment and scope definition will be taken into account in the annuity value submitted for this asset in the 2016-17 price reset.

SKM also recommended that SunWater conduct electrical condition tests on the cable at this time, such as earth impedance testing, insulation breakdown testing rather than rely on visual inspections.

(c) Timing of Renewal/Refurbishment

Given the nature of the asset and in absence of a recent condition assessment, it is prudent to plan for replacement within this annuity period. However, SKM believe that the run to failure

asset life adopted by SunWater is not in line with industry practice. If an industry standard 45 year asset life is adopted, then the planned replacement date should be 2027-28 (that is, 45 years from the in operation date of 1982). SKM stated that this still places replacement within this price setting annuity period. SKM recognised that a new condition assessment may reveal accelerated condition deterioration which may make it appropriate to bring forward the replacement date in due course.

Conclusion on Prudency Evaluation

SKM concluded that it is prudent to plan for replacement of this asset at or around the date of the end of the run to failure asset life. However, SKM considered that the standard asset life should be 45 years, in line with industry norms, and not 35 years. Nevertheless, with a 45-year life, it is appropriate to plan for replacement within this annuity period. As such, the inclusion of this annuity item in the annuity value is prudent.

Efficiency Evaluation

SKM noted that 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 bill of materials (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 1996-97 valuation. The 1996-97 value for each line is then escalated by a multiplier determined by Cardno in a 2007-08 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+45.9%) to take account of annuity item replacement specific factors such location, project management costs etc.

SKM noted that this approach (including the indirect uplift multipliers) was 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 considered the approach to be appropriate.

(a) Renewal/Replacement Item Cost Evaluation

SKM reviewed SunWater's calculation for determining a replacement cost and confirmed that it applied the Indirect Cost multiplier contained in the BOM for this asset item in its SAP-WMS of 45.9%. 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 noted that the Three Moon Creek WSS is approximately 250 km west of Bundaberg and, whilst this is not the most remote of locations of SunWater's assets, this location may go some way to explaining the high Indirect Cost uplift.

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

SKM compared their cost estimate against SunWater's cost estimate as shown below.

Table 4.5: SKM's Costing

SunWater Estimate $2009-10	*SKM Estimate $2009-10*	*Variance*
254,414	216,121	+17.8%

Source: SKM (2011).

SKM noted that a Planning Order has not yet been developed for this asset and therefore SunWater has not developed a breakdown of direct and overhead costs.

Conclusion on Efficiency Evaluation

The cost estimate submitted by SunWater for replacement of this annuity item is within the estimating range of SKM's estimated cost for a modern equivalent replacement asset. Therefore, SKM considered SunWater's proposed expenditure value of $254,414 to be efficient.

Summary and Conclusions

Whilst SKM do not agree with the timing of the replacement of this asset, due to a lower than industry standard asset life being adopted by SunWater, SKM are satisfied of the need for replacement of this annuity item within this annuity period. As such inclusion of this annuity item in the overall expenditure for this annuity period is prudent.

From their benchmarking of the replacement costs, SKM are satisfied that the annuity item replacement value submitted by SunWater is efficient.

Authority's Analysis

The Authority accepted Halcrow and SKM's recommendation that the item is prudent, but with deferral to 2027-28. Further, the Authority accepts SKM's recommendation that the item is efficient.

The Authority notes that the total cost (including direct and indirect) submitted by SunWater for this renewals item ($309,000) does not equate to the amount reviewed by SKM ($254,414). As discussed in Volume 1, 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

Conclusion

In summary, four items for the Three Moon Creek WSS were sampled. All four items are considered to be prudent and efficient and have been retained as forecast expenditure although one was deferred from 2017-18 to 2027-28.

Further, as noted in Volume 1, after a consideration of all its consultants' reviews, the Authority has recommended that a 10% saving be applied to 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 4.6.

Table 4.6: Review of Forecast (Direct) Renewals Expenditure 2011-36 ($'000)

Item	*Year*	*SunWater*	*Authority's Findings*	*Recommended*
Sampled Items				
1. LBT/1 12TMC03-Refurb Ladders & Platforms-Inlt	2011-12	11	Prudent and efficient	11
2. LBT/2 12TMCXX Refurbish Pipework - Interior/Exterior	2011-12 and 25 yearly thereafter	33	Prudent and efficient	33
3. LBT/3 09 TMC-STUDY: 5 Year Dam Safety	2013-14 and 5 yearly	15	Prudent and efficient	15
4. LBT/4 Replace Cables & Cableways	2017-18	206	Prudent and efficient, deferred to 2027-28	206
Non-Sampled Items				10% saving applied.

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

4.6 SunWater's Consultation with Customers

Submissions

SunWater

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.

Other Stakeholders

No other stakeholders have commented on this matter.

Authority's Analysis

In Volume 1, the Authority noted customers' concerns about the lack of involvement in the planning of future renewals expenditure has been raised by irrigators and their representatives.

The Authority recommends 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.

4.7 Allocation of Headworks Renewals Costs According to WAE Priority

Previous Review

For the 2006-11 price path, the renewals costs for the Three Moon Creek bulk water infrastructure were apportioned between priority groups using converted nominal water allocations. The conversion to medium priority WAE for the Three Moon Creek WSS was determined by a WPCF of 3:1; that is, one ML of high priority WAE was considered equivalent to 3 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).

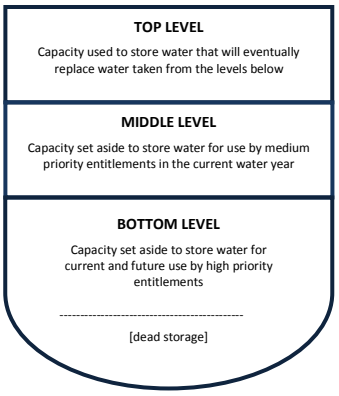
SunWater submitted that, in general, the HUF allocates a greater proportion of capital costs per ML to high priority WAE. Specifically, the HUF methodology takes into account water sharing rules, critical water sharing arrangements (CWSAs) and other operational requirements that typically give high priority 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 (HP) and medium priority (MP) for the purposes of the HUFs calculation[4].

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 IROL.

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

[4] 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.

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:

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

Set 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 Three Moon Creek WSS are summarised in Table 4.7. The HUFs for this scheme (SunWater 2010d) are 8% for medium priority (surface water), 52% for medium priority (groundwater) and 40% for high priority.

Table 4.7: Application of HUFs Methodology

STEP 1: Water Entitlement Groups (DERM's Water Allocation Register)

Nominal Group	(ML)	HUF Group	(ML)
Medium Priority (Surface Water)	1,940	MP_A	14,561
Medium Priority (Ground Water)	12,621		
High Priority	580	HP_A	580

STEP 2: IROL Conversion Factor Adjustment

Conversion Factor: $IROL_{CF}$	N/A
Maximum volume that can be converted to HP: $HP_A max$	580
Corresponding volume of MP: $MP_A min = MP_A-(HP_A max-HP_A)*IROL_{CF}$	14,561

STEP 3: Water Sharing Rules & Operational Requirements

Water Sharing Rules	
Volume below which MP not available: $MP_0 AA$	N/A
Volume above which max. MP available: $MP_{100} AA$	N/A
CWSAs and other operational requirements	
Likely increase in volume effectively reserved for HP: MP_0	6,650
Likely increase in min. storage before maximum MP available: MP_{100}	26,715
Key Dam Level Measures	
Full Supply Level: FSV_{hwks}	88,500
Dead Storage Level: DSL_{hwks}	650

STEP 4: Hydrologic performance of headworks storage

Storage Layer	Storage Capacity (ML)	Prob. of Utilisation	Utilised Capacity (ML)
Top: $\max\{(FSV_{hwks}-MP_{100}),0\}$*	MP_2 = 47,562; HP_2 = 1422	1%	MP_{2u} = 665; HP_{2u} = 19
Middle: $\min\{(MP_{100}-MP_0),(FSV_{hwks}-MP_0)\}$	MP_1 = 20,065	37%	MP_{1u} = 7,365
Bottom: $MP_0 - DSV_{hwks}$	HP_1 = 6,000	88%	HP_{1u} = 5,268

STEP 5: Calculation of HUFs for each Water Entitlement Group

Formula	HUF Group	Nominal Group
MP_A: $(MP_{1u}+MP_{2u}) / (MP_{1u}+HP_{1u}+MP_{2u}+HP_{2u})$ = (7,365+665) / (7,365+5,268+665+196)	HUF_{mp} = 60%	Medium Priority (Surface Water) = 8% Medium Priority (Groundwater) = 52%
HP_A: $(HP_{1u}+HP_{2u}) / (MP_{1u}+HP_{1u}+MP_{2u}+HP_{2u})$ = (5,268+196) / (7,365+5,268+665+196)	HUF_{hp} = 40%	High Priority = 40%

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

Other Stakeholders

No other stakeholders have commented on this matter.

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 – 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 (2011y) accepted these recommendations and submitted recalculated HUFs for each scheme. For the Three Moon Creek WSS, the changes resulted in the HUF_{mp} value rising from 60% to 61% (8% for surface water and 53% for groundwater), and the HUF_{hp} value falling from 40% to 39% (Table 4.8).

Table 4.8: Revised HUF Calculations

STEP 4: Hydrologic performance of headworks storage

Storage Layer	Storage Capacity (ML)	Prob. of Utilisation	Utilised Capacity (ML)
Top layer			
Initial	MP_2 = 47,562; HP_2 = 1422	1%	MP_{2u} = 665; HP_{2u} = 19
*Revised**	MP_2 = 59,418; HP_2 = 2,367	no change	MP_{2u} = 818; HP_{2u} = 33
Middle Layer	MP_1 = 20,065	37%	MP_{1u} = 7,365
Bottom Layer	HP_1 = 6,000	88%	HP_{1u} = 5,268

STEP 5: Calculation of HUFs for each Water Entitlement Group

	Initial	Revised	Nominal Group
HUF_{mp}	60%	61%	Medium Priority (Surface Water) = 8% Medium Priority (Groundwater) = 53%
HUF_{hp}	40%	39%	High Priority = 39%

**Apportioned between MP_2 and HP_2 using the ratio of nominal volumes (MP_A:HP_A) Source: SunWater (2010d).*

The Authority estimates that based on the HUF methodology, the conversion for medium priority to high priority would be 16.05:1. This compares with the WPCF of 3:1 used for 2006-11 price paths. Further, the Authority notes that under the HUF approach, medium priority irrigators will now pay 61.0% of the cost of renewals whereas previously medium priority irrigators paid 89.3%.

4.8 Calculating the Renewals Annuity

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

For the Three Moon Creek WSS the recommended renewals annuity for the 2012-17 regulatory period is shown in Table 4.9. The renewals annuity for 2006-11 and SunWater's proposed annuity for 2012-16 is also presented for comparison.

Table 4.9: Three Moon Creek 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*
SunWater	119	112	108	107	110	136	135	134	132	132	132
Authority	-	-	-	-	-	-	105	104	103	102	102
High Priority	-	-	-	-	-	-	40	39	38	38	38
Medium Priority	-	-	-	-	-	-	66	65	64	64	64

Note: Includes indirect and overhead costs relating to renewals expenditure, which is discussed in Chapter 5
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 the Three Moon Creek WSS;

(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 prudency 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 contracts[5] 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 and other supporting activities (these were not classified by direct and indirect costs). SunWater noted that:

(a) a Service Manager and 18 staff are located at the Biloela depot and are responsible for the day-to-day water supply management and for delivery of the programmed works for all users in this 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 IROL – a major part of which is gathering and reporting data at quarterly and annual intervals on water sharing rules, water accounting and reporting on stream flow, water quality and other data (Table 5.1).

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

Storage	***Monthly Monitoring Requirements***			
	Inflow	***Head Water***	***Tail Water***	***BGA***
Cania Dam	No	Yes	Yes	Yes

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

(ii) dam safety – Cania Dam is classified as referable dam under the *Water Act 2000*. Routine dam safety inspections are carried out monthly on Cania Dam and quarterly on the weirs. Specific dam safety inspections are required at Cania 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 IROL 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; and

(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 WHS, financial reporting and taxation and irrigation pricing;

(d) insurance is obtained on a portfolio basis and allocated to the scheme;

(e) the recreation facilities at Cania Dam are managed by the North Burnett Regional Council; and

(f) other supporting activities include central procurement, human resources and legal services.

Previous Review

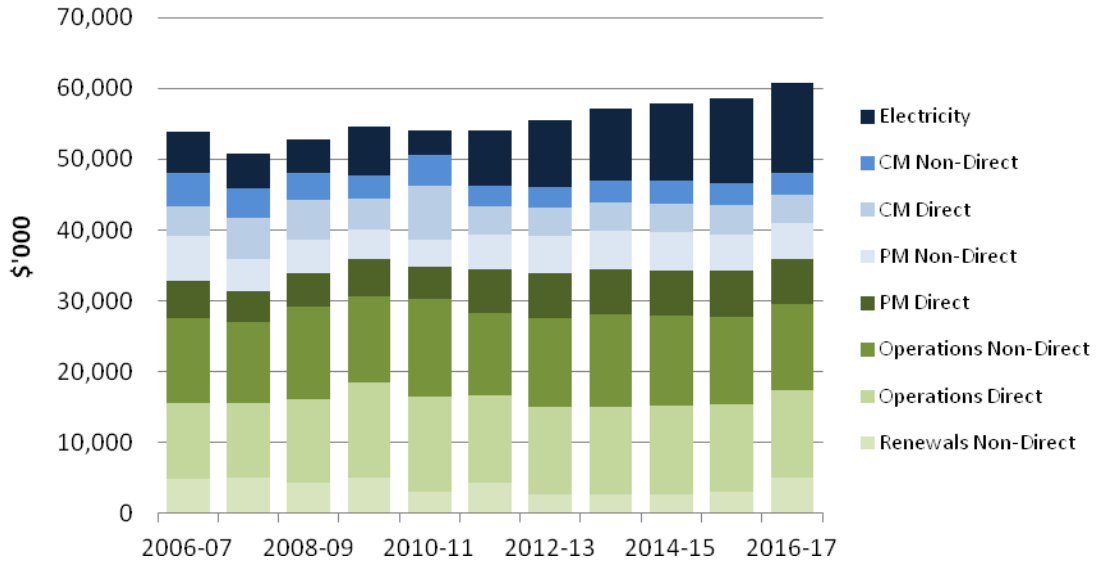
For the 2006-11 price paths, Indec identified annual cost savings of between $3.8 million and $5.5 million (2010-11 dollars) or 7.5% to 9.9% of total annual costs, which SunWater was to achieve during the 2006-11 price paths (SunWater, 2006a). See Volume 1.

Stakeholder Submissions

SunWater

SunWater's past and forecast total operating costs for its irrigation service contracts (all sectors) are summarised in Figure 5.1. 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 as noted in Volume 1.

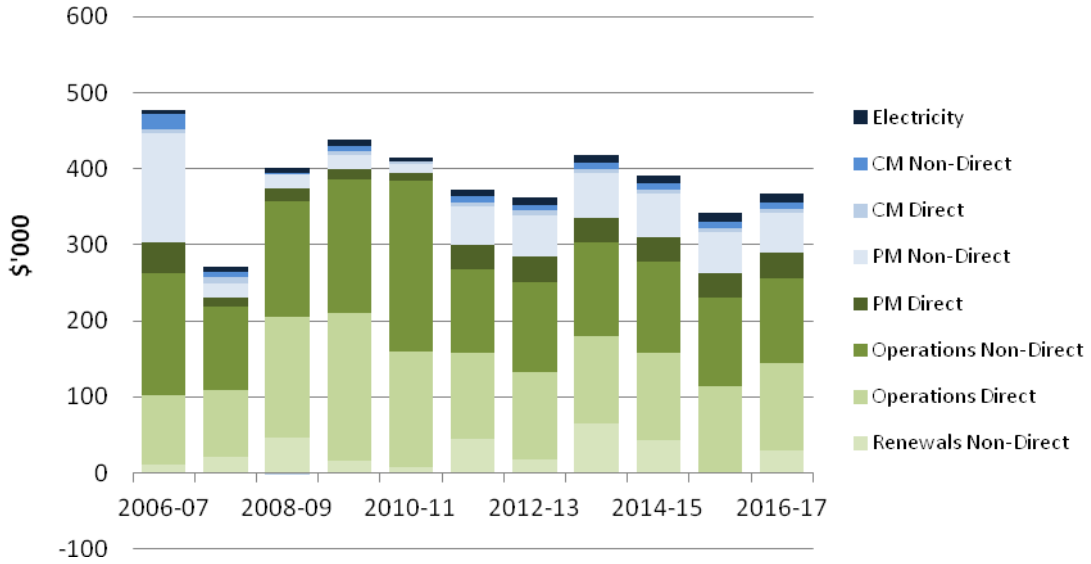
Figure 5.1: SunWater's Total Operating Costs (Real $'000) – All Service Contracts



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 Three Moon Creek WSS (all sectors) is shown in Figure 5.2 and Table 5.2 and Table 5.3.

Figure 5.2: Total Operating Costs – Three Moon Creek 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	253	198	311	368	377	223	233	238	234	230	227
Electricity	6	6	7	8	6	8	9	10	11	12	13
Preventive Maintenance	183	30	35	33	22	83	88	90	89	86	85
Corrective Maintenance	26	16	1	12	3	13	13	14	14	13	13
Renewals Non-Direct	10	21	47	17	7	45	18	66	44	0	29
Total	**477**	**271**	**400**	**438**	**414**	**372**	**362**	**417**	**391**	**341**	**367**

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).

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	75	52	77	96	93	90	92	92	92	92	92
Electricity	6	6	7	8	6	8	9	10	11	12	13
Contractors	2	3	6	17	12	3	4	4	4	4	4
Materials	11	5	2	3	4	4	4	4	4	4	4
Other	47	47	88	96	56	53	53	53	53	53	53
Non-Direct	337	159	219	217	245	213	200	255	228	177	202
Total	**477**	**271**	**400**	**438**	**414**	**372**	**362**	**417**	**391**	**341**	**367**

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 $360,000 per year over the period of the current price path (in real terms). [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 2012-16 are $336,000 per annum (in real terms).

Other Stakeholders

During Round 1 consultation in May 2010, stakeholders stated the Authority needed to:

(a) take account of the higher costs to irrigators of pumping water from an aquifer (bore) rather than from a stream or irrigation channel; and

(b) review SunWater's costs drivers and allocation of costs to recreational users.

During Round 2 consultation in April 2011, stakeholders submitted that:

(a) a lesser number of staff in the schemes means a lower level of service. Staff numbers had been reduced from 30 to 15;

(b) if SunWater and the Authority's consultants undertaking the operating expenditure review do not have sufficient cost data, then irrigators will have no way of knowing if their costs are prudent and efficient. Irrigators involved in the current price path review claimed that SunWater has a more detailed cost breakdown, which the Tier 2 group used for their decisions. The Authority should insist on getting these costs from SunWater;

(c) labour and materials should also decrease if direct labour is decreased. Labour and materials are normally presented in ordinary business budgets instead of separately. Labour costs are much higher relative to materials.

P Francis and M Francis (2011):

(a) stated that further analysis is required of operating cost forecasts to verify the basis for the forecast and the prudency and efficiency of operation costs. In particular, questions

raised regarding the causes for increased in operating costs over 2007-08 to 2009-10 years, particularly as there was a reduction in local staff during this period; and

(b) questioned whether the efficiency gain effecting direct costs targeted in the 2007-08 initiative by SunWater have been fully implemented. Further, they enquired about the implications of these efficiencies for the Three Moon Creek WSS.

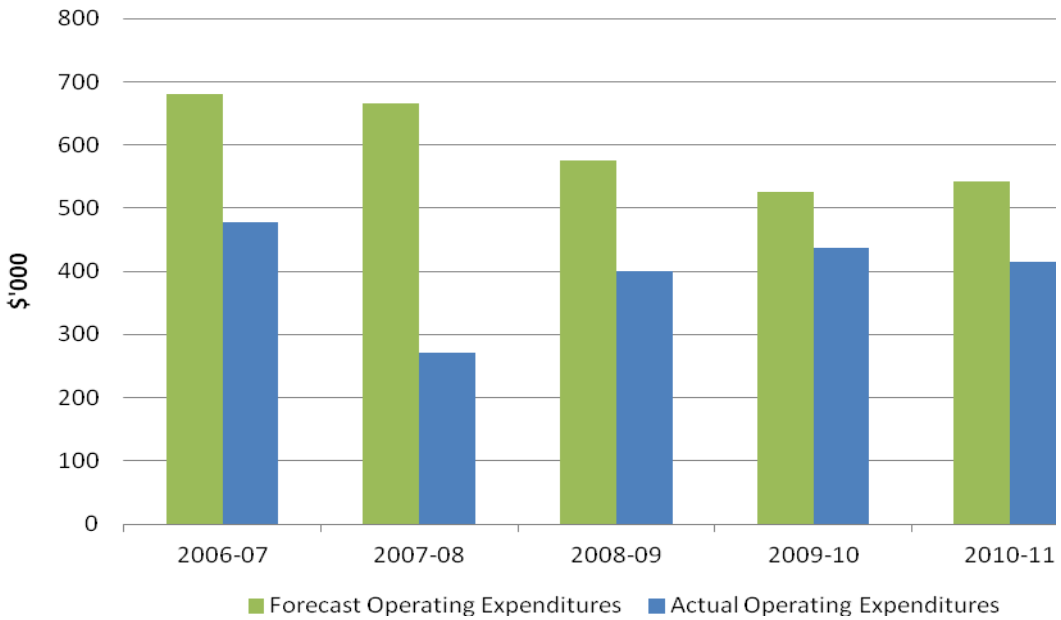
Authority's Analysis

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 Three Moon Creek WSS is shown in Figure 5.3 below. For this scheme, SunWater's actual operating cost were less than Indec's forecast efficient operating costs by approximately $988,000 over the period.

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 adjust 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 has engaged other consultants to address potential scheme specific cost savings.

In response to stakeholder submissions, the Authority notes that:

(a) the allocation of costs is discussed below;

(b) staff levels do impact upon the level of service received by customers. However, SunWater is required to obtain the most efficient level of staff numbers to achieve the required level of service for its customers. Hence while staff numbers have decreased, the level of service should be maintained at required levels;

(c) the review of SunWater's operating expenditure has been undertaken with the data and information provided by SunWater and additional information collated by Halcrow. Where necessary additional information has been requested; and

(d) the Authority has adopted efficient labour and material costs in its review. Details are provided 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.

Stakeholders

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 Three Moon Creek WSS are in Table 5.4.

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
Three Moon Creek	337	159	219	217	245	213	200	255	228	177	202

Source: SunWater (2011ap).

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

During Round 1 consultation in May 2010, stakeholders submitted that they were concerned about the level and allocation of SunWater's management and administrative costs.

During Round 2 consultation in April 2011, stakeholders submitted that:

(a) indirect costs are too high;

(b) irrigators question why Brisbane overhead costs are included on top of that of Rockhampton;

(c) the Brisbane office seems overstaffed and so far removed from issues in the scheme; and

(d) irrigators should not pay for insurance.

P Francis and M Francis (2011) questioned whether the:

(a) efficiency gains effecting indirect and overhead costs targeted in the 2007-08 initiative by SunWater had been fully implemented; and

(b) increasing centralisation of SunWater provides an effective approach for management the scheme into the future.

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 prudency 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 dollars) 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.[6]

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

In addition, the Authority recommends 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 has also reviewed the allocation of non-direct costs to irrigation service contracts.

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 proposal 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 has 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 that are most directly related to their schemes and not, for example, for Infrastructure Management overhead costs from the other three regions.

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

[6] For example, PVWater has 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.

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	337	159	219	217	245	213	200	255	228	177	202
Authority							194	244	215	164	185

Source: SunWater (2011ap).

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

In response to stakeholder submissions, the Authority notes that:

(a) Deloitte was commissed by the Authority to review SunWater's non-direct costs and identified savings for the whole of SunWater

(b) the allocation fo these costs are discussed below;

(c) the costs associated with the Brisbane office relate to SunWater as a whole which are different to the scheme specific costs;

(d) as above, Deloitte was enaged to review SunWater's non-direct costs and identified cost savings; and

(e) insurance costs are addressed in Volume 1.

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.

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. 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	91	88	159	193	152	113	114	115	114	115	115
Electricity	6	6	7	8	6	8	9	10	11	12	13
Preventive Maintenance	39	10	17	14	10	32	33	33	33	33	33
Corrective Maintenance	5	8	-2	4	2	5	5	5	5	5	5
Total	**141**	**113**	**181**	**220**	**170**	**158**	**162**	**163**	**163**	**164**	**165**

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).

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	75	52	77	96	93	90	92	92	92	92	92
Electricity	6	6	7	8	6	8	9	10	11	12	13
Contractors	2	3	6	17	12	3	4	4	4	4	4
Materials	11	5	2	3	4	4	4	4	4	4	4
Other	47	47	88	96	56	53	53	53	53	53	53
Total	**141**	**113**	**181**	**220**	**170**	**158**	**162**	**163**	**163**	**164**	**165**

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 Halcrow to review the prudency and efficiency of SunWater's proposed direct operating expenditure for this scheme.

Halcrow (2011) noted that it sought to obtain detailed information to facilitate its assessment of prudency and efficiency. In particular, Halcrow sought to understand the basis for SunWater's expenditure forecasts, together with the key assumptions used in their development. Halcrow noted that while SunWater has provided information in response to the requests made, the data was insufficiently disaggregated to enable a detailed review of cost information. This limited Halcrow's ability to adequately assess the prudency and efficiency of the proposed expenditure.

In Volume 1, the Authority recommends that SunWater undertake a review of its planning policies, processes and procedures to better achieve its strategic objectives. The Authority also recommends 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.

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

Item 1: Operations

Stakeholder Submissions

SunWater

Operational activities associated with the Three Moon Creek WSS include scheduling and delivery of water, reading meters and observation bores, water quality monitoring, compliance reporting, site inspections and environmental management.

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

Other Stakeholders

During Round 2 consultations in April 2011, stakeholders submitted that further explanation is required of the 1.5% increase in labour costs.

Authority's Analysis

Consultant's Review

Halcrow noted that in accordance with the IROL, one or two releases are made from Cania Dam per annum to fill the weirs and recharge groundwater aquifers. The releases are usually made over a three-month period during the winter or summer season. The scheme is operated manually.

Operations staff are required to undertake weekly monitoring of the embankments and spillway of Cania Dam. The IROL for the scheme lists the volumetric and quality monitoring that SunWater is obligated to undertake. Monitoring the presence of Blue Green Algae is also undertaken as required. SunWater's compliance officer is responsible for ensuring that SunWater's monitoring requirements are met.

A significant element of the operational activities undertaken on the scheme related to collecting and reporting of data relating to water supply, the environment and safety. SunWater used a range of systems to collect and report data in the required formats.

A breakdown of historical expenditure into key operations sub-activities is shown in Table 5.8. A similar breakdown for forecast expenditure has not been provided.

Table 5.8: Historical Operations Expenditure (Real $'000)

Sub-Activities	*2006-07*	*2007-08*	*2008-09*	*2009-10*
Customer Management	13	4	3	6
Workplace H&S	14	2	1	9
Environmental Management	33	25	28	39
Water Management	22	16	57	52
Scheme Management	77	88	122	175
Dam Safety	44	23	71	70
Schedule/Driver	50	28	12	8
Metering	-	10	15	9
Facility Management	-	3	1	-
Other	-	-	-	-
Total	**253**	**198**	**311**	**368**

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

The key elements of operations expenditure relate to scheme management, dam safety, water management and environmental management, as shown in the table above.

Table 5.9 provides a breakdown of historical and forecast expenditure on operations at the Three Moon Creek Bulk WSS.

Table 5.9: Historical and Forecast Operations Expenditure (Real $'000)

Type	*2006-07*	*2007-08*	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*
Labour	39	41	69	84	58	58	58	58	58	51
Materials	7	-	-	-	-	-	-	5	2	-
Contactors	2	3	3	15	3	3	3	4	4	4
Other	43	44	86	94	48	48	48	48	48	48
Total Direct Costs	**91**	**88**	**159**	**193**	**109**	**110**	**109**	**115**	**112**	**103**
Indirects	117	61	73	76	50	50	58	65	59	55
Overheads	45	49	79	99	59	59	61	65	63	60
Total	**253**	**198**	**311**	**368**	**218**	**220**	**228**	**244#**	**234#**	**218**
Annual Change	-	(22%)	57%	18%	(41%)	1%	4%	7%	(4%)	(7%)
Change Since 2007	-	(22%)	23%	46%	(14%)	(13%)	(10%)	(3%)	(7%)	(14%)

Source: Halcrow (2011). Note (#) Minor differences in expenditure between this table and the NSP relates to indirects and overheads. Note: This table is based on SunWater's original NSP and may differ from more recent SunWater data.

Halcrow noted that operations costs increased significantly over the period between 2006-07 and 2009-10, with direct expenditure forecast to remain above 2006-07 levels (in real terms) in the period to 2015-16. Halcrow requested that SunWater provide an explanation for the increase in costs over the years, together with quantification of each factor identified. In response, SunWater indicated that, "the 2006-07 data is not very reliable as the Business Operating Model was implemented from 1 July 2008. Indirect cost allocation in the 2006-07 data (which amount for most of the variation in costs) are not reliable." No other explanation was provided by SunWater in relation to the change in expenditure.

Halcrow also noted that in its NSP, SunWater stated that it undertook a review of work practices in 2009-10 which resulted in revised work instructions upon which the cost forecasts were based. While SunWater provided a high level breakdown of operations data, no information relating to the review of work instructions was provided. However, SunWater provided explanations for key movements in the expenditure.

Halcrow observed a significant reduction in direct costs between 2009-10 and 2010-11. SunWater explained that this was due to the realignment of expenditure classified as Operations to Preventive Maintenance. It noted that operations surveillance was moved to Preventive Maintenance as a result of the PB review. Halcrow noted that SunWater's forecast expenditure on Preventive Maintenance has increased, although this did not account for all of the reduction in Operations.

In addition, Halcrow indicated that it is likely that the labour expenditure has been reduced due to SunWater's SLFI (cost savings) review, which has resulted in the centralisation of services, and reductions to staff numbers. However, SunWater indicated that the impact of the SLFI (cost savings) review on the Three Moon Creek scheme is a reduction in Indirect and Overhead

costs from 2010-11 (i.e. it has not specifically identified reductions in labour expenditure as a result of the SLFI review).

The average expenditure on labour over the period 2006-07 to 2009-10 was $58,000, which is in line with forecast expenditure.

SunWater provided an extract of its resource planning tool used to develop labour forecasts for 2011-12. Halcrow was able to confirm that the forecast labour expenditure has been built up by assessing the tasks required and the most efficient method of delivering the required work. The extract provided indicated that the direct labour charge for operations in the Three Moon Creek Bulk WSS in 2011-12 was based on approximately 874 hours per annum for operations staff from the Central resource centre and the Asset Management resource centre. This accounted for approximately $45,500 per annum of the labour expenditure, and was equivalent to approximately 0.6 FTE staff working on operations. This allowance appeared reasonable, although more information on the review of work practices and how these have driven allowances for labour hours was required to assess prudency and efficiency.

Labour hours and charges for Corporate Council, Strategy, Health & Safety or Services Delivery resource centres were not shown on the extract of the resource planning tool provided, but account for approximately $12,000 per annum of direct labour expenditure. No information was provided in relation to this expenditure.

The labour forecast included real increases of 1.5% in 2011-12 and 2012-13, which was consistent with its Enterprise Agreement (of an increase of four% nominal for 2011-12 and 2012-13). Labour was forecast to remain steady (in real terms) thereafter.

SunWater has forecast a reduction in other expenditure, to $48,000 in 2010-11. Expenditure was forecast to remain steady thereafter. SunWater noted that this was driven by a reduction in insurance costs due to the increase in asset value from other service contracts (the insurance premium calculation is based on the asset value for all SunWater assets). Insurance accounted for $35,000 per annum, with Local Authority rates, $12,000 and Land Tax at $1,000. SunWater is required by law to pay Local Authority rates and Land Tax and this expenditure was therefore considered appropriate.

Although Halcrow was unable to undertake a detailed review of SunWater's operations expenditure, on the basis of the information and explanations provided by SunWater, Halcrow was generally satisfied that the expenditure appeared to be reasonable. However a definitive assessment of prudency and efficiency was not possible from the information provided.

Conclusion

In Volume 1, the Authority recommended that SunWater staff continue to conduct all quarterly meter reads.

Halcrow concluded that the expenditure appears to be reasonable, but was unable to draw definitive conclusions on the prudency and efficiency of proposed expenditures due to the insufficient information provided by SunWater. The Authority notes that Halcrow did not recommend any adjustment to operations costs for this scheme.

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

Further, SunWater's forecast average annual operations costs are approximately 23% lower than the average over 2006-11.

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

In response to stakeholder comment regarding the labour cost, SunWater has effectively provided for a nominal 4% increase per year for the first two years (2011-12 and 2012-13), but only 2.5% in the years thereafter. SunWater would need to achieve efficiency gains to be able to cover the shortfall of 1.5% per year in later years.

Item 2: Preventive Maintenance

Stakeholder Submissions

SunWater

SunWater defined preventive maintenance in its NSP 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.

Further, SunWater stated that 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 set out in Table 5.6 above.

Other Stakeholders

During Round 2 consultation in April 2011, stakeholders submitted that weeds have been non-existent in the last three years, and weed control costs are therefore not justified.

Authority Analysis

Consultant's Review

A breakdown of SunWater's historical and forecast expenditure on preventive maintenance in the Lower Fitzroy WSS is provided in Table 5.10.

Table 5.10: Historical and Forecast Expenditure - Preventive Maintenance (Real $'000)

Type	*2006-07*	*2007-08*	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*
Labour	32	78	9	27	28	28	28	28	28	28
Materials	2	1	4	1	2	2	2	2	2	2
Contractors	-	-	3	3	-	-	-	-	-	-
Other	4	1	2	1	2	2	2	2	2	2
Total Direct Costs	**39**	**10**	**17**	**14**	**32**	**32**	**33**	**33**	**33**	**33**
Indirects	105	11	9	8	24	24	28	29	28	26
Overheads	38	8	9	10	27	27	28	28	28	28
Total	**183**	**30**	**35**	**33**	**83**	**83**	**88**	**90**	**89**	**86**
Annual Change	-	(84%)	16%	(6%)	154%	1%	6%	2%	(2%)	(3%)
Change Since 2007	-	(84%)	(81%)	(82%)	(55%)	(54%)	(52%)	(51%)	(51%)	(53%)

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

Halcrow noted that SunWater forecast a significant jump in preventive maintenance as compared to its historical expenditure. Of the direct expenditure, this is primarily driven by an increase in labour expenditure. SunWater explained that the increase in labour was due to increased water availability (Cania Dam was at very low levels during prior years). The increased water availability resulted in more servicing of water meters and increased weed control around weirs and structures. SunWater noted that with a full dam, two releases will be made from Cania Dam each year with a winter and summer release therefore requiring additional preventive maintenance.

SunWater also provided a breakdown of historical expenditure into condition monitoring, servicing and weed control, as shown in Table 5.11.

Table 5.11: Preventive Maintenance (Real $'000)

Sub-Activity	*2006-07*	*2007-08*	*2008-09*	*2009-10*
Condition Monitoring	24	17	19	19
Servicing	152	9	5	6
Weed Control	8	4	11	7
Total	**183**	**30**	**35**	**33**

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

Halcrow noted that the expenditure in 2006-07 is significantly greater than the expenditure in 2007-08 to 2009-10. Halcrow indicated that the reason for this is the transfer of financial data into SunWater's revised Business Operating Model, which came into effect on 1 July 2008. This involved the reclassification of some activities, including some tasks previously coded as refurbishment projects to preventive maintenance codes.

Further, SunWater's condition monitoring and servicing forecast expenditure was primarily based on forecasts developed by PB, although it also included allowances for additional servicing activities.

As part of the review undertaken by PB, it forecast expenditure of approximately $24,500 per annum ($2009-10 real) on condition monitoring and servicing for the coming price path period. This is equivalent to approximately $25,400 per annum ($2010-11 real), and this excludes overhead and indirect costs.

Halcrow was generally satisfied that the expenditure forecast developed by PB is based on appropriate drivers, taking into account both the nature and frequency of the activities to be undertaken. However, Halcrow noted that this estimate was built up from SunWater's existing work instructions and its current approach to maintenance, which is yet to be optimised. Consequently, it is likely that there is scope to achieve efficiency savings in the delivery of servicing and condition monitoring activities, which are not currently reflected in the expenditure presented in the NSP. Furthermore, as the breakdown of forecast expenditure provided to this review splits out expenditure into labour, materials, contractors, rather than into condition monitoring, servicing and weed control, it was not possible to confirm that the forecast expenditure is in fact based on the forecast developed by PB.

Accounting for the forecast expenditure developed by PB, the remaining expenditure is approximately $6,600 per annum. The forecast of preventive maintenance expenditure also includes expenditure related to weed control, and "additional servicing, calibration and adjustment of equipment such as pumps, motors, regulator gates, meters and valves". SunWater indicated that this is based on the average of previous years' expenditure, although no additional information on the nature or make up of this expenditure was provided. While Halcrow was unable to comment in detail on the prudency and efficiency of this expenditure, it was noted that Cania Dam has been operating at or close to capacity since January 2011. The increased water availability is likely to result in additional servicing of water meters and increased weed control around weirs and structures. On this basis, the additional expenditure appeared reasonable. However, in the absence of appropriate justification, adjustment of the forecast preventive maintenance expenditure by this amount was proposed.

SunWater's Response

SunWater noted Halcrow's comments that it was unable to account for $6,600 of preventive maintenance costs.

In response, SunWater submitted that, in reviewing its preventive maintenance activity costs, Halcrow 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 Halcrow took the PB costs and concluded that the residual relates to weed control.

Halcrow then looked to understand the basis of this residual and evaluate whether it was prudent and efficient. In some cases, Halcrow 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 Halcrow 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 is 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.

Conclusion

In Volume 1, the Authority accepted the basis of Halcrow's adjustments to condition monitoring and services. Further, 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.

Notwithstanding SunWater's response, the Authority considers that the approach adopted by Halcrow is reasonable as efficiency at the activity level can only be determined by assessing efficiency at the sub-activity level. The Authority recognises that efficiencies can be gained by sharing labour between activities and schemes. However, an estimate of the costs of conducting an activity necessarily requires an assessment of the costs of the component sub-activities.

The Authority accepts Halcrow's recommendation to remove $6,600 of unjustified preventive maintenance expenditure. SunWater has not established the efficiency of this expenditure at the sub or activity level.

In response to stakeholder submissions, the Authority notes that SunWater has statutory obligations to manage weeds (and pests) on its land. Therefore, the Authority considers that weed control costs are justified. SunWater noted in its NSP that weed and pest management is conducted by local operations staff as part of their routine activities.

Item 3: Corrective Maintenance

Stakeholder Submissions

SunWater

SunWater submitted that even with sound preventive maintenance practices, unexpected failures can occur or other incidents can arise that require reactive corrective maintenance. While these are difficult to forecast with accuracy, history has shown that such events can be expected and need to be factored into expenditure forecasts.

There are 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 also stated that a provision has been made for 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.

Other Stakeholders

No other stakeholders commented on this item.

Authority Analysis

Consultant's Review

A breakdown of historical and forecast expenditure on corrective maintenance is provided in Table 5.12.

Table 5.12: Corrective Maintenance Expenditure (Real $'000)

Type	*2006-07*	*2007-08*	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*
Labour	3	3	-	4	4	4	4	4	4	4
Material	1	4	(2)	1	1	1	1	1	1	1
Contractors	-	-	-	-	-	-	-	-	-	-
Other	-	1	-	-	-	-	-	-	-	-
Total Direct Cost	**5**	**8**	**(2)**	**4**	**5**	**5**	**5**	**5**	**5**	**5**
Indirects	17	4	-	3	3	3	4	4	4	4
Overheads	4	4	2	4	4	4	4	4	4	4
Total	**26**	**16**	**1**	**12**	**13**	**13**	**13**	**14**	**14**	**13**
Annual Change	-	(38%)	(95%)	1365%	8%	1%	5%	2%	(1%)	(2%)
Change Since 2007	-	(38%)	(97%)	(55%)	(51%)	(51%)	(48%)	(47%)	(48%)	(49%)

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

Halcrow stated that as shown in Table 5.12 above, the expenditure has fluctuated, although this has primarily been driven by changes in indirects and overheads. SunWater's 2010-11 budget includes a slight increase in expenditure over 2009-10 levels, after which time it is forecast to remain approximately steady.

Further, SunWater is forecasting that direct expenditure (on labour, material, contractors and other) will remain in line with historical expenditure.

Halcrow stated that SunWater's forecast expenditure was based on an average of the past four years (including 2011), excluding outliers. SunWater has not provided Halcrow with the calculations in support of its forecast of corrective maintenance. However, a breakdown of the expenditure indicates labour charges of $4,000 related to staff from the SunWater's Central region.

As part of this review, SunWater provided a report listing all of the work instructions relating to corrective maintenance activity raised in the period 2008-09 to 2010-11. The breakdown indicated that expenditure on corrective maintenance was marginally lower than that reported in Table 5.12. However, Halcrow understood this is because some work orders run over multiple years. The corrective maintenance activities undertaken were typical of what might be reasonably expected from the assets in the scheme.

Table 5.13 shows historical and proposed expenditure on corrective and preventive maintenance. As evident from the table, SunWater's overall expenditure on maintenance is forecast to increase significantly when compared to historical expenditure.

Table 5.13: Maintenance Expenditure (Real $'000)

	2006-07	*2007-08*	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*
Preventive Maintenance	39	10	17	14	32	32	33	33	33	33
Corrective Maintenance	5	8	(2)	4	5	5	5	5	5	5
Total Maintenance	**44**	**18**	**15**	**19**	**37**	**37**	**38**	**38**	**38**	**38**
Annual Change	-	(58%)	(18%)	25%	95%	1%	1%	-	-	-
Change since 2007	-	(58%)	(66%)	(57%)	(16%)	(15%)	(14%)	(14%)	(14%)	(14%)
Preventive Maintenance	89%	56%	113%	76%	86%	86%	86%	86%	86%	86%
Corrective Maintenance	11%	44%	(13%)	24%	14%	14%	14%	14%	14%	14%

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

Halcrow noted that it is commonly accepted that there is an optimum mix of preventive and corrective maintenance. The optimum mix represents the most economical combination of preventive and corrective maintenance activities to achieve a desired set of outcomes. While Halcrow indicated that SunWater intends to move to a RCM approach to maintenance planning in order to optimise the mix of preventive and corrective maintenance activities, the forecast expenditure in the NSP does not reflect this approach. Consequently, there may be some scope for SunWater to optimise its proposed corrective and preventive maintenance programs.

SunWater's Response

SunWater noted that Halcrow stated corrective maintenance has not been optimised to take account of the changes to preventive maintenance.

In response, SunWater submitted that the PB review focussed on costing the preventive maintenance program as it exists. The PB review did not result in major changes to the historic preventive maintenance program.

Where the PB review resulted in changes to preventive maintenance costs from the past, this was due to more accurate and updated costing, rather than a change to the preventive maintenance program itself.

In some cases, additional condition monitoring is carried out (e.g. on storages after floods / pumping equipment if minor faults occur during the peak season). In some cases, an additional allowance was included as this condition monitoring was not in the scope of the work instructions reviewed by PB.

SunWater is progressively introducing condition-based maintenance rather than the previous time-based maintenance approach. The RCM process has started but will take some time to implement due to the number of assets involves. It would not be prudent to reduce the corrective maintenance costs at this time.

Any reductions to corrective maintenance as a result of this shift will also take some time to materialise, and any savings will be difficult to predict.

Conclusion

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 recommended that SunWater formally document its processes for the development of correct maintenance expenditure forecasts.

The Authority notes Halcrow's finding (not disputed by SunWater) that there may be scope to achieve efficiency in the optimisation of these programs but these efficiencies are yet to be quantified.

In the absence of any measure of the impact of the optimisation process, the Authority does not propose to apply any specific adjustments to this measure but intends to take this into account when considering the application of a general efficiency target (as outlined below).

Item 4: Electricity

Stakeholder Submissions

SunWater

SunWater submitted that electricity use in the Three Moon Creek WSS is minimal.

SunWater 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 (2011h).

SunWater 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 (2011ak).

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

Other Stakeholders

No other stakeholders commented on this item.

Authority Analysis

Consultant's Review

Halcrow stated that electricity use in the Three Moon Creek WSS is minimal, historically accounting for 1.3% to 2.4 % of operating expenditure. Electricity costs have increased from approximately $6,000 in 2006-07 to approximately $8,000 in 2009-10. As shown in Table 5.14, SunWater has forecast that expenditure on electricity will remain steady, at $9,000, which is the 2010-11 budgeted expenditure.

Table 5.14: Electricity Expenditure (Real $'000)

	2006-07	*2007-08*	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*
Electricity	6	6	7	8	9	9	9	9	9	9
Annual Change	-	-	16.7%	14.3%	12.5%	-	-	-	-	-
Change Since 2007	-	-	16.7%	33.3%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%

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

Halcrow noted that SunWater's forecasts of electricity have been developed on the basis that it will continue to procure energy from the Franchise market. SunWater indicated that Franchise Tariffs are reviewed on an annual basis to ensure that individual sites are on the most appropriate tariff. In addition, in the Background paper QCA review of irrigation prices – electricity costs, SunWater has noted that it periodically assesses the merits of moving from the franchise tariffs to the contestable electricity market to ensure the costs of electricity are minimised. SunWater has argued that the variable nature of power usage associated with the supply of irrigation water means that it is not feasible to purchase electricity from the contestable market. While Halcrow accepted that this is likely to be the case, these periodic assessments do not appear to be documented.

SunWater's Board has set a target to improve energy efficiency by 1% per annum for each of the next five years. However, during interviews with SunWater, it agreed that it would be very difficult to measure savings of one percent given the relative accuracy of electricity and flow meters. Halcrow indicated that the savings have not been incorporated into forecast expenditures.

The 2010-11 budget ($9,048) is based on actual electricity expenditure in 2009-10 ($7,987 nominal), inflated by 13.29% to account for the increase in franchise tariffs. The method adopted to forecast electricity costs for the scheme appears appropriate.

Halcrow noted that electricity use in these schemes is typically stable year on year, and not material when compared to other elements of operating expenditure.

SunWater indicated that Franchise Tariffs are reviewed on an annual basis to ensure that individual sites are on the most appropriate tariff. In addition, in the Background paper QCA review of irrigation prices – electricity costs, SunWater has noted that it periodically assesses the merits of moving from the franchise tariffs to the contestable electricity market to ensure the costs of electricity are minimised. SunWater has argued that the variable nature of power usage associated with the supply of irrigation water means that it is not feasible to purchase electricity from the contestable market. While Halcrow accepted that this is likely to be the case, these periodic assessments do not appear to be documented.

In terms of reducing electricity usage, SunWater noted that its ability to control pumping during peak and off-peak periods is limited. This is primarily due to limited storage volumes, and the requirement to provide water to irrigators irrespective of whether it is during peak or off-peak periods.

Conclusion

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.

As noted in Volume 1, the Authority proposes 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.

At this stage, the Authority does not accept an escalation rate that makes an explicit allowance for carbon price impacts prior to them becoming enacted legislation.

The Authority notes Halcrow's conclusion that SunWater's forecast electricity expenditure appears appropriate. However, the Authority has conducted a more detailed review of SunWater's electricity expenditure. The Authority's recommended electricity costs are set out below.

Item 5: Escalation

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 recommends 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 recommends that direct materials and contractor costs be escalated at 4% per annum.

Other Direct 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.

Non-direct Costs

The Authority accepts SunWater's proposal to escalate all non-direct costs by 2.5% per annum for the 2012-17 regulatory period, and for the interim year 2011-12.

Conclusion

A comparison of SunWater's and the Authority's direct operating costs for the Three Moon Creek WSS is set out in Table 5.15.

The Authority's proposed costs include all specific adjustments and the Authority's proposed cost escalations as noted above. As noted in Volume 1, the Authority has applied a minimum 2.43% saving to direct operating costs (excluding electricity) in 2012-13. A further 0.75% saving arising from labour productivity is also applied, compounding annually.

Table 5.15: Direct Operating Costs (Real $'000)

	SunWater					***Authority***				
	2012-13	***2013-14***	***2014-15***	***2015-16***	***2016-17***	***2012-13***	***2013-14***	***2014-15***	***2015-16***	***2016-17***
Operations	114	115	114	115	115	111	111	111	111	111
Electricity	9	10	11	12	13	8	8	9	9	10
Preventive Maintenance	33	33	33	33	33	32	32	32	32	32
Corrective Maintenance	5	5	5	5	5	5	5	5	5	5
Total	**162**	**163**	**163**	**164**	**165**	**155**	**156**	**156**	**157**	**158**

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.

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.

Other Stakeholders

R Roth (2011) stated that irrigators are not the only people that are affected by the SunWater facility. The town of Monto draws its water supply from the aquifer adjacent to Three Moon Creek. Tourism and Recreation (fishing included) also takes place in the Cania Dam/Cania George area and users should bear some of the cost and not all the costs imposed upon the irrigator.

Authority's Analysis

In Volume 1, the Authority has 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 recommends that within bulk service contracts, insurance premiums are allocated between medium and high priority customers on the basis of HUFs.

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

5.6 Summary of Operating Costs

SunWater's proposed operating costs by activity and type are set out in Table 5.16. The Authority's recommended operating costs are set out in Table 5.17. (The non-direct costs allocated to renewals are not included in these tables.)

Table 5.16: SunWater's Proposed Operating Costs (Real $'000)

	2012-13	*2013-14*	*2014-15*	*2015-16*	*2016-17*
Operation					
Labour	59	59	59	59	59
Materials	0	0	0	0	0
Contractors	4	4	4	4	4
Other	51	51	51	51	51
Non-Direct	119	123	120	115	113
Preventive Maintenance					
Labour	28	28	28	28	28
Materials	2	2	2	2	2
Contractors	0	0	0	0	0
Other	2	2	2	2	2
Non-Direct	55	58	56	54	53
Corrective Maintenance					
Labour	4	4	4	4	4
Materials	1	1	1	1	1
Contractors	0	0	0	0	0
Other	0	0	0	0	0
Non-Direct	8	8	8	8	8
Electricity	9	10	11	12	13
Total	**344**	**352**	**347**	**341**	**338**

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 5.17: The Authority's Recommended Operating Costs (Real $'000)

	2012-13	*2013-14*	*2014-15*	*2015-16*	*2016-17*
Operation					
Labour	57	58	58	59	59
Materials	0	0	0	0	0
Contractors	3	3	3	3	3
Other	49	49	49	48	48
Non-Direct	116	118	113	107	103
Preventive Maintenance					
Labour	27	28	28	28	28
Materials	2	2	2	2	2
Contractors	0	0	0	0	0
Other	2	2	2	2	2
Non-Direct	54	55	53	50	48
Corrective Maintenance					
Labour	4	4	4	4	4
Materials	1	1	1	1	1
Contractors	0	0	0	0	0
Other	0	0	0	0	0
Non-Direct	8	8	8	7	7
Electricity	8	8	9	9	10
Total	**333**	**337**	**331**	**321**	**316**

Source: QCA (2011).

6. DRAFT 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 (including the Three Moon Creek Scheme). 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 both the river and groundwater segments of this scheme, prices over 2006-11 increased by an average of $2/ML per annum in real terms (plus CPI), without reaching lower bound costs.[7] In 2011-12, prices in this scheme were increased by CPI.

6.2 Approach to Calculating Prices

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.

6.3 Total Costs

The Authority's estimate of prudent and efficient total costs for the Three Moon Creek 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.

[7] The average annual increase of $2/ML in real terms was comprised of a $0.25 increase in the first year, a $2.50 increase in each of the next three years, and a $2.25 increase in the last year.

Table 6.1: Total Costs for the Three Moon Creek WSS (Real $/ML)

	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	582	358	458	525	516	461	477	484	477	471	468
Renewals Annuity	119	112	108	107	110	136	135	134	132	132	132
Operating Costs	467	250	353	421	407	327	344	352	347	341	338
Revenue Offsets	-4	-4	-3	-3	-2	-2	-2	-2	-2	-2	-2
Authority's Total Costs	-	-	-	-	-	-	436	439	432	422	416
Renewals	-	-	-	-	-	-	105	104	103	102	102
Operating Costs	-	-	-	-	-	-	333	337	331	321	316
Revenue Offsets	-	-	-	-	-	-	-2	-2	-2	-2	-2
Return on Working Capital	-	-	-	-	-	-	0	0	0	0	0

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

6.4 Fixed and Variable Costs

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.

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;

(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 (although in Three Moon Creek, preventive maintenance was 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;

(c) 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 this scheme, 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 of both the river and groundwater segments which reflect the recovery of 70% of costs in the fixed charge and 30% of costs in the volumetric charge.

In general, the Authority accepts Indec's recommended tariff structure, for the reasons outlined in Volume 1.

6.5 Allocation of Costs According to WAE Priority

Fixed Costs

The method of allocating fixed costs to priority groups is outlined in Chapter 4 Renewals Annuity and Chapter 5 Operating Costs. The outcome is summarised in Table 6.2.

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

	2012-13	*2013-14*	*2014-15*	*2015-16*	*2016-17*
Net Fixed Costs	406	409	401	392	386
High Priority	125	125	123	121	119
Medium Priority	281	283	278	272	267

Note: Net fixed costs are net of revenue offsets and return on working capital. Source: SunWater (2011ap) and QCA (2011).

These costs are translated into the fixed charge using the relevant WAE for each priority group.

Variable Costs

Variable costs are allocated to all users on the basis of water use. 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. Accordingly, to determine the volumetric charge, the Authority has assumed historical total water use for all sectors to be 50.8% of WAE.

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.

Table 6.3: Prices for the Three Moon Creek WSS ($/ML)

	Actual Prices						*Cost-Reflective Prices*				
	2006-07	*2007-08*	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*	*2016-17*
River											
Fixed (Part A)	14.24	16.20	18.60	20.84	23.04	23.88	19.43	19.91	20.41	20.92	21.44
Volumetric (Part B)	10.18	11.57	13.29	14.89	16.46	17.04	4.02	4.12	4.22	4.32	4.43
Groundwater											
Fixed (Part A)	7.24	9.00	11.04	13.08	15.00	15.56	19.43	19.91	20.41	20.92	21.44
Volumetric (Part B)	5.18	6.43	7.89	9.33	10.72	11.11	4.02	4.12	4.22	4.32	4.43

Source: Actual Prices (SunWater, 2011al) and Cost Reflective Prices (QCA, 2011).

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

To identify the relevant price path (if any), the Authority must first identify whether current prices recover prudent and efficient costs. To do so, given changes to tariff structure, the Authority has compared current revenues with revenues that would arise under the cost-reflective tariffs, if implemented (see Volume 1).

The Authority has 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).

For the river tariff group, 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 this tariff group.

For the groundwater tariff group, current revenues are below the level required to recover prudent and efficient costs. Therefore, the Authority must consider a price path to cost recovery for this tariff group.

Table 6.4: Comparison of Current Prices and Cost-Reflective Prices (Real $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	24.21	17.29	1,358	368	39,240	27,861	11,379
Groundwater	15.76	11.26	12,789	3,468	240,603	262,382	-21,779

Source: Source: SunWater (2011al), SunWater (2011ao) and QCA (2011).

As the Three Moon Creek WSS is a hardship scheme, irrigation prices can only increase in real terms at a pace consistent with 2006-11 price paths, until cost recovery is achieved. The pace of increase in the 2006-11 price paths was capped at $10/ML over the five years.

In Volume 1, the Authority recommended that, after tariff rebalancing, fixed charges in hardship schemes should increase by $2/ML per annum in real terms until cost recovery is achieved. This is consistent with the pace of increase in 2006-11 prices. Volumetric charges are to reflect variable costs from 2012-13.

After tariff rebalancing, the revenue-neutral tariff for the groundwater tariff group is a Part A charge of $17.21 per WAE and Part B charge of $4.02 per ML of usage, and the $2/ML real increase is applied to the fixed Part A charge. Cost-reflective charges are achieved in 2013-14.

6.8 The Authority's Recommended Prices

The Authority's recommended prices to apply to the Three Moon Creek 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: Draft Prices for the Three Moon Creek WSS ($/ML)

	Actual Prices						*Recommended Prices*				
	2006-07	*2007-08*	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*	*2016-17*
River											
Fixed (Part A)	14.24	16.20	18.60	20.84	23.04	23.88	27.29	27.97	28.67	29.39	30.13
Volumetric (Part B)	10.18	11.57	13.29	14.89	16.46	17.04	4.02	4 12	4.22	4.32	4.43
Groundwater											
Fixed (Part A)	7.24	9.00	11.04	13.08	15.00	15.56	19.21	19.91	20.41	20.92	21.44
Volumetric (Part B)	5.18	6.43	7.89	9.33	10.72	11.11	4.02	4 12	4.22	4.32	4.43

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

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).

REFERENCES

Anderson, B. (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, September.

Arthur Andersen. (1997).

ARUP. (2011). Review of SunWater's Network Service Plans - Cluster 4 Final Report. A Consultancy Report Prepared for the Queensland Competition Authority, July.

Aurecon. (2011). Review of SunWater's Network Service Plans Bundaberg Cluster Final Report. A Consultancy Report Prepared for the Queensland Competition Authority, August..

Australian Bureau of Statistics (ABS). (2011a). *Engineering Construction Activity, Australia., cat. no. 8762.* Canberra: Australian Bureau of Statistics.

Australian Bureau of Statistics (ABS). (2011b). *Labour Price Index, cat. no. 6345*. Canberra: Australian Bureau of Statistics.

Australian Bureau of Statistics (ABS). (2011c). *Producer Price Index, cat. no. 6427*. Canberra: Australian Bureau of Statistics.

Australian Competition and Consumer Commission (ACCC). (2008a). W*ater Charge (Termination Fees) Rules Final Advice*. Canberra: Commonweath of Australia.

Australian Competition and Consumers Commission (ACCC). (2008b). *Water Market Rules.* Canberra: Commonwealth of Australia.

Australian Competition and Consumers Commission (ACCC). (2011). *Pricing Principles for Price Approvals and Determinations Under the Water Charge (Infrastructure) Rules 2010.* Canberra: Commonwealth of Australia.

Australian Energy Regulator (AER). (2007). Decision: Powerlink Queensland Transmission Network Revenue Cap 2007-08 to 2011-12, Canberra: Commonwealth of Australia.

Australian Sugar Milling Council (ASMC). (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.

Avondale Water Board (AWB). (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.

Baldwin, N. S. (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, May.

Biggs, J. (2011). Submission re: Irrigation Prices for SunWater Cunnumulla Weir Scheme, April.

Bowen Broken Water Supply Scheme Irrigators (BBWSSI). (2011). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.

Boyne River Irrigator Advisory Committee (BRIAC). (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, August.

Boyne River Irrigator Advisory Committee (BRIAC). (2011). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.

Bundaberg Fruit and Vegetable Growers Cooperative Limited. (BFVG). (2010a). Submission re: Irrigation Prices for SunWater Schemes 2011-16, August.

Bundaberg Fruit and Vegetable Growers Cooperative Limited (BFVG). (2010b). Submission re: Irrigation Prices for SunWater Schemes 2011-16, November.

Bundaberg Regional Irrigators Group (BRIG). (2010a). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.

Bundaberg Regional Irrigators Group (BRIG). (2010b). Submission re: Irrigation Prices for SunWater Schemes 2011-16, September.

Bundaberg Regional Irrigators Group (BRIG). (2010c). Submission re: Nodal Pricing, September.

Bundaberg Regional Irrigators Group (BRIG). (2010d). Submission re: Extended Water Pricing Consultation Period, November.

Bundaberg Regional Irrigators Group (BRIG). (2010e). Submission re: Irrigation Prices for Bundaberg Schemes 2011 to June 2016 on Issues Papers Released as at November 2010, November.

Bundaberg Regional Irrigators Group (BRIG). (2011a). Submission re: Irrigation Prices for SunWater Schemes 2011-16, February.

Bundaberg Regional Irrigators Group (BRIG). (2011b). Submission re: Irrigation Prices for SunWater Schemes 2011-16, March.

Bundaberg Regional Irrigators Group (BRIG). (2011c). Submission re: Irrigation Prices for the Bundaberg Scheme 2011 to June 2016 Following the Bundaberg Visit by Aurecon Representatives March 2011, March.

Bundaberg Regional Irrigators Group (BRIG). (2011d). Submission re: Irrigation Prices for SunWater Schemes 2011-16 Bundaberg Scheme, April.

Bundaberg Sugar (BS). (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, August.

Burdekin River Irrigation Area Irrigators Committee (BRIAIC). (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, November.

Burdekin River Irrigation Area Irrigators Committee (BRIAIC). (2011a). Submission re: Irrigation Prices for SunWater Schemes 2011-16, March.

Burdekin River Irrigation Area Irrigators Committee (BRIAIC). (2011b). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.

CANEGROWERS. (2011a). Submission re: Irrigation Prices for SunWater Schemes 2011-16, February.

CANEGROWERS. (2011b). Submission re: Irrigation Prices for SunWater Schemes 2011-16, March.

CANEGROWERS. (2011c). Submission re: Irrigation Prices for Sunwater Schemes 2011-16, April.

CANEGROWERS Isis Limited. (2010a). Submission re: Bundaberg Isis Irrigation Scheme, August.

CANEGROWERS Isis Limited. (2010b). Submission re: The Progress of the Bundaberg - Isis Irrigation Scheme, August.

CANEGROWERS Isis Limited. (2010c). Submission re: Water Pricing Options for the Bundaberg WSS, August.

CANEGROWERS Isis Limited. (2011). Submission re: Bundaberg Water Supply Scheme and Distribution System Network Service Plans, April.

CANEGROWERS Proserpine Limited. (2011). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.

Cardno. (2008). Asset Valuation: Final Report. A Consultancy Report Prepared for SunWater, June.

Cardno-Atkins. (2008). 2008 Review of Water Prices - Assessment of Expenditure Forecasts for Southern Rural Water: Final Report. A Consultancy Report Prepared for Essential Services Commission (ESC), March.

Cardno-Atkins. (2009). Strategic Management Overview and Review of Operating and Capital Expenditure of State Water Corporation 2009: Final. A Consultancy Report Prepared for the Independent Pricing and Regulatory Tribunal of New South Wales (IPART), November.

Central Downs Irrigators Ltd. (CDI). (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, August.

Central Highlands Cotton Growers and Irrigators Association (CHCGIA). (2010a). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.

Central Highlands Cotton Growers and Irrigators Association (CHCGIA). (2010b). Submission re: Issues Paper, August.

Childers and District Fruit and Vegetables Growers Association (CDFVGA). (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, August.

Cooinda Cotton Co.(CCC) (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, July.

Cooinda Cotton Co. (CCC) (2011). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.

Cotton Australia. (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, November.

Cotton Australia/QFF. (2011a). Submission re: Irrigation Prices for SunWater Schemes 2011-16, February.

Cotton Australia/QFF. (2011b). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.

Council of Australian Governments (COAG). (1994). *Report of the Working Group on Water Resource Policy: Communique.* Canberra: Council of Australian Governments.

Council of Australian Governments (COAG). (2004). *Intergovernmental Agreement on a National Water Initiative.* Canberra: Council of Australian Governments.

Council of Australian Governments (COAG). (2010). *National Water Initiative Principles.* Canberra: Council of Australian Governments.

Cronin, S. (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.

Dawson Valley Irrigators Group (DVIG). (2010). Submission re: Irrigation Prices for SunWater Scheme 2011-16, July.

Department of Environment and Resource Management (DERM). (2000). Interim Resource Operations License: Burdekin Irrigation Area. Brisbane: Department of Environment and Resource Management.

Department of Natural Resources and Water (DNRW). (2008). *Submission to Water Charge Rules Issues Paper for Charges Payable to Irrigation Infrastructure Operators*. Brisbane: Department of Natural Resources and Water.

Deloitte. (2011a). SunWater Administration Cost Review Phase 2. A Consultancy Report Prepared for the Queensland Competition Authority, August.

Deloitte. (2011b). SunWater Working Capital Allowance. A Consultancy Report Prepared for the Queensland Competition Authority, August..

Deloitte. (2011c). Operations Benchmarking Phase 1: SunWater and PV Water. A Consultancy Report Prepared for the Queensland Competition Authority, August.
Deloitte. (2011d). Forecast Growth in Labour Costs: Update of December 2010 Report. A Report Prepared for Australian Energy Regulator.

Dunsdon, G. (2011). Submission re: Irrigation Prices for SunWater Schemes 2011-16 for the Cunnamulla Weir Scheme, May.

Economic Regulation Authority (ERA). (2007). Inquiry on Harvey Water Bulk Water Pricing, April.

Economic Regulation Authority (ERA). (2009). Inquiry into Tariffs of the Water Corporation, Aqwest and Busselton Water, August.

Enkelmann, P. (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.

Enkelmann, P. (2011a). Submission from the Murgon Meeting of the 14 April 2011, April.

Enkelmann, P. (2011b). Submission re: Irrigation Water Prices 2011-16, April.

Enkelmann, P. (2011c). Submission re: Water Pricing for Barker Barambah Water Supply Scheme, April.

Ernst and Young. (1997). SCARM Water Industry Asset Valuation Study - Draft Guidelines on Determining Full Cost Recovery, August.

Essential Services Commission (ESC). (2008). 2008 *Water Price Review: Regional and Rural Businesses' Water Plans 2008-13 and Melbourne Water's Drainage and Waterways Water Plan 2008-13*, June.

Essential Services Commission (ESC). (2009). M*etropolitan Melbourne Water Price Review 2008-09: Final Decision*, June.

Essential Services Commission of South Australia (ESCOSA). (2010). *Inquiry into the 2010-11 Metropolitan and Regional Potable Water and Sewerage Pricing Process: Final Report*, October.

Eton Irrigators Advisory Committee (EIAC). (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.

Eton Irrigators Advisory Committee (EIAC). (2011a). Submission re: Irrigation Prices for SunWater Schemes 2011-16, March.

Eton Irrigators Advisory Committee (EIAC). (2011b). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.

Francis, P., & Francis, M. (2011). Submission re: Irrigation Prices for SunWater Schemes 2011-16 - Three Moon Creek Water Supply Scheme, April.

Frontier Economics. (2005). Review of Pricing Policies: A Report Prepared for Goulburn Murray Water, March.

Frontier Economics. (2008). Termination Fees and Landholder Considerations. A Consultancy Report Prepared for the Australian Competition and Consumers Association, October.

GHD. (2001). State Water Projects Distribution System Efficiency Review: Burdekin Irrigation Area. A Consultancy Report Prepared for the Department of Natural Resources.

GHD. (2009). Review of WHS Hazard Reduction Project Schedule Close-off Report, November.

GHD. (2011). Review of SunWater's Network Service Plans: Toowoomba Cluster - Operational and Capital Expenditure - Final Report. A Consultancy Report Prepared for the Queensland Competition Authority, August..

Gilbert and Sutherland. (2011). Quality Assurance Assessment of a Review of SunWater's Headworks Utilisation Factors Methodology. A Consultancy Report Prepared for the Queensland Competition Authority, March.

Goulburn-Murray Water (GMW). (2009). Goulburn-Murray Water: Water Services Committee Charter, September.

Growcom. (2010). Submission re: Segmented Water Pricing in Bundaberg, September.

Halcrow. (2005). 2005 Review of Rural Water Prices Assessment of Expenditure Forecasts: Goulburn-Murray Water. A Consultancy Report Prepared for the Essential Services Commission, December.

Halcrow. (2011). SunWater - Biloela Water Supply Schemes ("Cluster 3"): Review of Price Paths 2011-2016. A Consultancy Report Prepared for the Queensland Competition Authority, June.

Hetherington, M. and Hetherington, K. (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.

Hinchliffe, G., Hinchliffe, P., & Farmer, G. (2011). Submission re: Network Service Plan - Lower Fitzroy Water Supply Scheme, April.

Hubert, J. (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.

Independent Competition and Regulatory Commission (ICRC). (2008). Water and Wastewater Price Review: Final Report and Price Determination, April.

INDEC. (2011a). SunWater Water Supply Schemes 2011-16 Price Paths: Audit and Review of SunWater's Business Operating Model (BOM). A Consultancy Report Prepared for the Queensland Competition Authority, March.

INDEC. (2011b). SunWater Water Supply Schemes 2011-16 Price Paths: Review of SunWater Pricing Model - Step 1. A Consultancy Report Prepared for the Queensland Competition Authority, March.

INDEC. (20111c). Qualitative Framework and Assessment of Fixed and Variable Cost Drivers A Consultancy Report Prepared for the Queensland Competition Authority, October.

INDEC. (2011d). SunWater Water Supply Schemes 2012-2017 Price Paths: Analysis of SunWater's 2006-07 to 2010-11 Renewals Expenditure Forecasts. A Consultancy Report Prepared for the Queensland Competition Authority, October.

INDEC. (2011e). *SunWater Irrigation Pricing Data Forecasts 2003-11*. Excel Spreadsheets Prepared for the Queensland Competition Authority.

INDEC. (2011e). SunWater Refurbishment and Augmentation Cash Spend Details. Excel Spreadsheets Prepared for the Queensland Competition Authority.

Independent Pricing and Regulatory Tribunal (IPART). (2004). Bulk Water Prices 2005-06 - Issues Paper, September.

Independent Pricing and Regulatory Tribunal (IPART). (2006). Bulk Water Prices for State Water Corporation and Water Administration Corporation, September.

Independent Pricing and Regulatory Tribunal (IPART). (2009a). Review of Prices for the Sydney Catchment Authority From 1 July 2009 to 20 June 2012; Water - Determination and Final Report, June.

Independent Pricing and Regulatory Tribunal (IPART). (2009b). Review of Prices for Water, Sewerage and Other Services for Hunter Water Corporation: Determination and Final Report, July.

Independent Pricing and Regulatory Tribunal (IPART). (2010a). Review of Bulk Water Charges for State Water Corporation: Water-Final, June.

Independent Pricing and Regulatory Tribunal (IPART). (2010b). Review of Prices for the Water Administration Ministerial Corporation, July.

Independent Pricing and Regulatory Tribunal (IPART). (2011). Review of Prices for the Water Administration Ministerial Corporation: Water - Determination, February.

InterSafe Group Pty Ltd. (2005). Report on High Risk Management Plan: SunWater Operations & Maintenance - Mareeba Works - Far North Queensland, July.

InterSafe Group Pty Ltd. (2007). Report on SunWater Ayr Region Sampled Focussed Recall, October.
Isis Central Sugar Mill (ICSM). (2010a). Submission re: Irrigation Prices for SunWater Schemes 2011-16, August.

Isis Central Sugar Mill (ICSM). (2010b). Submission re: Water Pricing Options, September.

Isis Sugar Partnership (ISP). (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, November.

Kavanagh, G. (2011). Submission re: Irrigation Prices for SunWater 2011-16, June.

Kelsey Creek Water Board (KCWB). (2011). Submission re: Irrigation Prices for SunWater Schemes, April.

Lower Boyne River Irrigators (LBRI). (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, August.

Lower Burdekin Water (LBW). (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.

Lower Burdekin Water (LBW). (2011). Submission re: Irrigation Prices for SunWater Schemes 2011-16, May.

MacDonald, K. (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.

Macintyre Brook Irrigators Association (MBIA). (2011). Submission re: SunWater Price Path Issues Regarding the Macintyre Brook Scheme, April.

Mackay Canegrowers Limited and Mackay Sugar Limited (MCL abd MSL). (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.

Mackay Irrigation Stakeholders (MIS). (2010). Submission re: Irrigations Prices for SunWater Schemes 2011-16, November.

Mackenzie, R. A. (2010a). Submission re: Rate of Return, June.

Mackenzie, R. A. (2010b). Submission re: Postage Stamp Prices, June.

Mackenzie, R. A. (2010c). Submission re: Standard Supply Contracts, September.

MacroMonitor (2010) Australian Construction Cost Trends 2010. Viewed on 19 October 2010. http://www.macromonitor.com.au/index_files/Pages570.htm.

Mareeba Dimbulah Irrigation Area Council (MDIAC). (2010). Submission re: Irrigation Prices for SunWater Schemes, November.

Mareeba Dimbulah Irrigation Area Council (MDIAC). (2011). Submission re: Irrigation Prices for SunWater Schemes, April.

Maryborough Sugar Factory (MSF). (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, November.

Maryborough Sugar Factory (MSF). (2011). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.

McColl, D. (2010a). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.

McColl, D. (2010b). Submission re: Irrigation Prices for SunWater Schemes 2011-16, November.

McGuigan, B. (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.

McLellan, P., & McLellan, B. (2011). Submission re: Irrigation Prices for SunWater Scheme 2011-2016, April.

Millar, C. (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, May.

National Water Commission (NWC). (2008). N*ational Performance Report 2006-07: Rural Water Service Providers.* Canberra: Australian Government.

National Water Commission (NWC). (2009a). *Australian Water Reform: Second Biennial Assessment of Progress in Implementation of the National Water Initiative*. Canberra: Australian Government.

National Water Commission (NWC). (2009b). *National Performance Report: Rural Water Performance Reporting Indicators and Definitions 2008-09*. Canberra: Australian Government.

National Water Commission (NWC). (2010). *National Performance Report 2008-09: Rural Water Service Providers*. Canberra: Australian Government.

National Water Commission (NWC). (2011). *National Performance Report 2009-10: Rural Water Service Providers*. Canberra: Australian Government.

NERA Economic Consulting. (2010a). Form of Price Control: SunWater Water Supply Schemes. Issues Paper Prepared for the Queensland Competition Authority, August.

NERA Economic Consulting (NERA). (2010b). Single or Multiple Rate of Return: SunWater. A Consultancy Report Prepared for the Queensland Competition Authority, August.

NERA Economic Consulting (NERA). (2011). Cost of Capital for Water Infrastructure Company. A Consultancy Report Prepared for the Queensland Competition Authority, March.

O'Brien MP, J. (2010). Submission re: Irrigation Prices fo SunWater Schemes 2011-16, June.

Office for Water Security. (2010). Water for Good. Adelaide: Government of South Australia.

Otto, N., & Otto, M. (2011). Submission re: Irrigation Prices for SunWater Schemes, April.

Parsons Brinckerhoff. (2010). Provisions of Services for Costing SunWater's Work Instructions. A Consultancy Report Prepared for SunWater, October.

Pioneer Valley Water Co-operative Limited (PVWCL). (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.

Pioneer Valley Water Co-operative Limited (PVWCL). (2011a). Submission re: SunWater Network Service Plan - Pioneer River Water Supply Schemes, February.

Pioneer Valley Water Co-operative Limited (PVWCL). (2011b). Submission on Consultants Draft Report on Pioneer WSS Network Service Plan, April.

Pioneer Valley Water Co-Operative Limited (PVWCL). (2011c). Submission on Consultants Draft Report on SunWater Administration Cost Review, April.

Pioneer Valley Water Co-Operative Limited (PVWCL). (2011d). Review of Irrigation Water Pricing in SunWater Schemes: Comments on SunWater Response to PVWater Submission, June.

PriceWaterHouseCoopers (PwC). (2010a). Pricing Principles and Tariff Sructures for SunWater's Water Supply Schemes. Issues Paper Prepared for the Queensland Competition Authority, September.

PriceWaterHouseCoopers (PwC). (2010b). Allocating Capital Costs of Bulk Water Supply Assets. Issues Paper Prepared for the Queensland Competition Authority, September.

Productivity Commission (PC). (2011). *Australia's Urban Water Sector (Draft Report)*. Canberra: Commonwealth of Australia.

Proserpine District Canegrowers Cooperative Limited and Proserpine Co-operative Sugar Milling Association Limited (PDCCL and PCSMAL). (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, November.

Queensland Competition Authority (QCA). (2000). Statement of Regulatory Pricing Principles for the Water Sector, December.

Queensland Competition Authority (QCA). (2002). Gladstone Area Water Board: Investigation of Pricing Practices, September.

Queensland Competition Authority (QCA). (2004). Draft Report on General Pricing Principles for Infrastructure Investments Made in Response to Exraordinary Circumstances.

Queensland Competition Authority (QCA). (2005). Gladstone Area Water Board: Investigation of Pricing Practices - Final Report, March.

Queensland Competition Authority (QCA). (2007). Final Decision: Advice to the Minister for Mines and Energy - Benchmark Retail Cost Index for Electricity: 2005-07 and 2007-08, June.

Queensland Competition Authority (QCA). (2009). Remade Final Decision: 2008-09 Benchmark Retail Retail Cost Index, June.

Queensland Competition Authority (QCA). (2010a). Gladstone Area Water Board: Investigation of Pricing Practices, July.

Queensland Competition Authority (QCA) (2010b). QR Network's 2010 DAU: Final Decision, September.

Queensland Competition Authority (QCA) (2010c). Final Decision: Benchmark Retail Retail Cost Index for Electricity: 2010-11, May.

Queensland Competition Authority (QCA). (2011a). South East Queensland (SEQ) Interim Price Monitoring for 2010-11, March.

Queensland Competition Authority (QCA). (2011b). South East Queensland (SEQ) Grid Service Charges 2011-12, July.

Queensland Competition Authority (QCA) (2011c). Final Decision: Benchmark Retail Retail Cost Index for Electricity: 2011-12, May.

Queensland Competition Authority (QCA) (2011d). Approval of QR Network's Revenue Cap Adjustment Amounts 2009-10, April.

Queensland Farmers' Federation (QFF). (2010a). Submission re: Irrigation Prices for SunWater Schemes 2011-16, July.

Queensland Farmers' Federation (QFF). (2010b). Submission re: Irrigation Prices for SunWater Schemes 2011-16, November.

Queensland Valuation Services (QVAS). (2010). Permanent Water Trade.

Robertson MP, Hon Stephen. (2010a). Submission re: Nodal Pricing Arrangements, September.

Robertson MP, Hon Stephen. (2010b). Submission re: Assets Associated with Bulk Water Supply Service, September.

Roth, R. (2011). Submission re: Irrigation Prices for Sunwater Schemes 2011-16 - Three Moon Creek, March.

SAHA. (2010). Renewals Annuity or a Regulatory Depreciation Allowance: SunWater's Water Supply Schemes 2011-16 Price Paths. Issues Paper Prepared for the Queensland Competition Authority, September.

SAHA. (2011). Assessment of SunWater's Administration Costs. A Consultancy Report Prepared for the Queensland Competition Authority, January.

Simpson Farms. (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, August.

Southern Rural Water (SRW). (2007a). Customer-Charter: Water Supply, Version 5, August.

Southern Rural Water (SRW). (2007b). Southern Rural Water: Water Plan 2008-13.

Sinclair Knight Merz (SKM). (2000).

Sinclair Knight Merz (SKM). (2011).

SP Exports. (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, August.

St George Irrigators (SGI). (2010). Perspectives on Pricing of Irrigation Water in Queensland 2011-2016, July.

St George Irrigators (SGI). (2011). St George Water Supply Scheme, Network Service Plan, 2012-2016, April.

State Water. (2008). 2008-12 Customer Service Charter Terms of Reference.

Stewart, D. (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, May.

Strathdee, B. (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, May.

SunWater. (2003). *SunWater Annual Report 2002-03.* Brisbane: SunWater Limited.

SunWater. (2004). *SunWaterAnnual Report 2003-04.* Brisbane: SunWater Limited.

SunWater. (2005). *SunWater Annual Report 2004-05.* Brisbane: SunWater Limited.

SunWater. (2006a). *Statewide Irrigation Pricing Working Group: Tier 1 Report*. Brisbane: SunWater Limited.

SunWater. (2006b). *SunWater Irrigation Price Paths 2006-07 to 2010-11: Final Report.* Brisbane: SunWater Limited, September.

SunWater. (2006c). *SunWater Annual Report 2005-06.* Brisbane: SunWater Limited.

SunWater. (2006d). Statewide Irrigation Pricing Working Group: Tier 1 Report - Working Paper No. 18 (Water Entitlement Pricing Conversion Factors). Brisbane: SunWater Limited.

SunWater. (2007). *SunWaterAnnual Report 2006-07.* Brisbane: SunWater Limited.

SunWater. (2008). *SunWater Annual Report 2007-08.* Brisbane: SunWater Limited.

SunWater. (2009). *SunWater Annual Report 2008-09*. Brisbane: SunWater Limited

SunWater. (2010a). QCA Review of Irrigation Prices: Public Submission Letter, May.

SunWater. (2010b). QCA Review of Irrigation Prices: Service Framework Background Paper. Brisbane, May.

SunWater. (2010c). QCA Review of Irrigation Prices: Contributed Assets Background Paper, May.

SunWater. (2010d). QCA Review of Irrigation Prices: Headworks Utilisation Factors Technical Report, September.

SunWater. (2010e). QCA Review of Irrigation Prices: Bulk Water Asset Valuation, October.

SunWater. (2010f). QCA Review of Irrigation Prices: Asset Management Planning Methodology Paper, October.

SunWater. (2010g). *SunWater Annual Report 2009-10.* Brisbane: SunWater Limited.

SunWater. (2010h). QCA Review of Irrigation Prices: Return of Capital Renewals or Depreciation, October.

SunWater. (2011). Three Moon Creek Water Supply Scheme Network Service Plan, January.

SunWater. (2011a). QCA Review of Irrigation Prices: Centralised Costs Background Paper, January.

SunWater. (2011b). QCA Review of Irrigation Prices: Cost Forecasting Assumptions Background Paper, January.

SunWater. (2011c). QCA Review of Irrigation Prices: Renewals Annuity Background Paper, January.

SunWater. (2011d). QCA Review of Irrigation Prices: Pricing Principles and Tariff Structures January.

SunWater. (2011e). QCA Review of Irrigation Prices: Form of Regulation, January.

SunWater. (2011f). QCA Review of Irrigation Prices: Review and Adjustment Triggers Supplementary Information, February.

SunWater. (2011g). QCA Review of Irrigation Prices: Allocation of Centralised Costs Supplementary Information, February.

SunWater. (2011h). QCA Review of Irrigation Prices: Electricity Costs Background Paper, February.

SunWater. (2011i). QCA Review of Irrigation Prices: Water Distribution Entitlements Supplementary Information, February.

SunWater. (2011j). QCA Review of Irrigation Prices: Bulk Water Price Differentiation Supplementary Submission, February.

SunWater. (2011k). QCA Review of Irrigation Prices: Customer Involvement in Renewals Expenditure Supplementary Background Paper, February.

SunWater. (2011l). QCA Review of Irrigation Prices: Weighted Average Cost of Capital - Renewals Annuity Background Paper, February.

SunWater. (2011m). QCA Review of Irrigation Prices: Pumping Cost Reconciliation, February.

SunWater. (2011n). QCA Review of Irrigation Prices: WAE Reconciliation, February.

SunWater. (2011o). QCA Review of Irrigation Prices: Storage Rental Fees, March.

SunWater. (2011p). QCA Review of Irrigation Prices: Pricing of Distribution Losses, March.

SunWater. (2011q). QCA Review of Irrigation Prices: Estimated Flood Damage Letter, March.

SunWater. (2011r). QCA Review of Irrigation Prices: Metering and Price Model Letter, March.

SunWater. (2011s). QCA Review of Irrigation Prices: Tariff Groupings, March.

SunWater. (2011t). QCA Review of Irrigation Prices: Revenue Analysis, March.

SunWater. (2011u). QCA Review of Irrigation Prices: Electricity - Actual vs 2006 IPR Forecast, March.

SunWater. (2011v). QCA Review of Irrigation Prices: Water Harvesting Usage Summary, April.

SunWater. (2011w). QCA Review of Irrigation Prices: Headworks Utilisation Factors, Critical Periods and Bulk Water Supply Capital Cost Allocatoon, April.

SunWater. (2011x). QCA Review of Irrigation Prices: Headworks Utilisation Factors, Combined Technical Paper and Addendum, May.

SunWater. (2011y). QCA Review of Irrigation Prices: Service Delivery Strategies, May.

SunWater. (2011z). QCA Review of Irrigation Prices: Service Delivery Paper, May.

SunWater. (2011aa). QCA Review of Irrigation Prices: Drainage Data, April.

SunWater. (2011ab). QCA Review of Irrigation Prices: Response to Pioneer Valley Water Board Submission on the Pioneer River Water Supply Scheme - Network Services Plan, May.

SunWater. (2011ac). QCA Review of Irrigation Prices: Administration Costs for Bundaberg Groundwater, June.

SunWater. (2011ad). QCA Review of Irrigation Prices: Supplementary Information on Electricity Cost Management, Background Paper, August.

SunWater. (2011ae). QCA Review of Irrigation Prices: Intersafe, August.

SunWater. (2011af). QCA Review of Irrigation Prices: SunWater Analysis of Working Capital, August.

SunWater. (2011ag). QCA Review of Irrigation Prices: SunWater Submission on Deloitte Administration Cost Review Stage 2 Report, August.

SunWater. (2011ah). QCA Review of Irrigation Prices: SunWater Submission on Drainage Charges, February.

SunWater. (2011ai). QCA Review of Irrigation Prices: Background Paper on the Treatment of Costs Related to Inflatable Rubber Dams, September.

SunWater. (2011aj). QCA Review of Irrigation Prices: Supplementary Information on Response to issues - operating costs forecasts, September.

SunWater. (2011ak). QCA Review of Irrigation Prices: Background Paper on Electricity Cost Re-Forecast, September.

SunWater. (2011al). SunWater Published Water Prices 2005-06 to 2011-12, PDF files submitted by SunWater to the Queensland Competition Authority.

SunWater. (2011am). SunWater Irrigation Pricing Model.

SunWater. (2011an). SunWater Annuity Expenditures 2007-11 for all 30 Irrigation Service Contracts. Excel Spreadsheet Submitted by SunWater to the Queensland Competition Authority.

SunWater. (2011ao). SunWater Financial Model. Excel Spreadsheet Submitted by SunWater to the Queensland Competition Authority.

SunWater. (2011ap). SunWater Operating Expenditures and Renewals 2007-11. Excel Spreadsheet Submitted by SunWater to the Queensland Competition Authority.

SunWater. (2011aq). QCA Review of Irrigation Prices: Background Paper on Expenditure Update Changed Regulatory Period, September.

Sydney Catchment Authority (SCA). (2010). Sydney Catchment Authority Annual Report 2009-10. Sydney: Sydney Catchment Authority.

Synergies Economic Consulting. (2010). Rural Water Pricing Business and Scheme Overview. A Consultancy Report to the Queensland Competition Authority, January.

Tableland Canegrowers Ltd and Mareeba District Fruit and Vegetable Growers Association Inc. (TCL abd MDFVGA). (2010a). Submission re: Key Issues on Irrigation Prices for Mareeba-Dimbulah Water Supply Scheme, July.

Tableland Canegrowers Ltd and Mareeba District Fruit and Vegetable Growers Association Inc (TCL and MDFCGA). (2010b). Submission re: Tiered Pricing, August.

Tanner, J., & Tanner, S. (2011). Submission re: Irrigation Prices fro SunWater Schemes 2011-16, May.

Thomas, W. A. (2011). Submission re: Principles Relevant to Recovering Long-Run Average Costs of SunWater Schemes, April.

Voss, A. (2011). Submission re: Irrigation Prices for SunWater Schemes 2011-16, April.

Water Act 2000 (Qld).

Water Act 2007, No. 137 (Cwlth).

Water Charge (Infrastructure) Rules (Cwlth).

Water Industry Regulatory Order 2003.

Water Regulation 2002 (Qld).

Water Supply (Safety and Reliability) Act 2008 (Qld).

Workplace Health and Safety Act 1995.

Weir, T. (2010). Submission re: Irrigation Prices for SunWater Schemes 2011-16, July.

World Wildlife Fund (WWF). (2010). Submission re: Irrigatiion Prices for SunWater Schemes 2011-16, May.

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.

Asset	*Year*	*Description*	*Value ($'000)*
Avis Weir	2012-13	13TMC-REGALVANISE INLET SCREENS	16
	2013-14	14TMC-REFURBISH PROTECTION WRKS - AVIS	22
	2022-23	10TMC01-REFURBISH VALVE AND WRAP FLANGE	15
	2035-36	10TMC01-REFURBISH VALVE AND WRAP FLANGE	15
Bazley Weir	2016-17	Refurbish: Clean, inspect and regalvanise inlet screen	12
	2022-23	Refurbish: Clean, inspect and regalvanise inlet screen	12
	2028-29	Refurbish: Clean, inspect and regalvanise inlet screen	12
	2034-35	Refurbish: Clean, inspect and regalvanise inlet screen	12
Cania Dam	2011-12	12TMCXX REFURBISH PIPEWORK INT/EXT PAINT	48
		12TMC03-REFURB LADDERS & PLATFORMS-INLT	20
		12TMCXX PATCH PAINT TRASHRACKS INSITU	15
		Design and fabricate adapter for conduit vent for forced ventilation of conduit during inspections	12
	2012-13	13TMC-REFURBISH BAULKS	23
	2013-14	09TMC-STUDY: 5 YEAR DAM SAFETY	46
		Investigation into possible Contaminated Land Sites	17
		14TMC-REFURBISH 900 B'FLY VLV1 INCL HYDR	15
		14TMC-REFURBISH 900 B'FLY VLV2 INCL HYDR	15
	2014-15	Enhance-Install ladder restraint and safety system in Valve House and Inlet Tower *	31
		Study: 5yr Dam Comprehensive Inspection (Review of EAPs, O&M SOPs)	25
		Upgrade position indicators on cone valves*	25
	2016-17	10TMC07-REPLACE SWITCHBOARD	72
		Replace Pump No1 - Town Water Supply	14
	2017-18	Replace Cables & Cableways	309
		Change Out: Replacement of water recorder instrumentation	15
	2018-19	09TMC-STUDY: 5 YEAR DAM SAFETY	43
	2019-20	Study: 20yr Dam Safety Review (by 1 Dec 2019)	121
		Refurbish Rip Rap - decomposing, replace upstream	97
		Study: 5yr Dam Comprehensive Inspection (Review of EAPs, O&M SOPs)	24
	2020-21	Refurbish Bgte - Repaint & seal - MS fabricated plug	61
		Replace Hoist 0.5T (Town Water)	31
	2021-22	Replace Hydraulic System	43
	2023-24	09TMC-STUDY: 5 YEAR DAM SAFETY	43
	2024-25	Enhance-Install ladder restraint and safety system in Valve House and Inlet Tower *	30
		Study: 5yr Dam Comprehensive Inspection (Review of EAPs, O&M SOPs)	24
		Upgrade position indicators on cone valves*	24
	2028-29	09TMC-STUDY: 5 YEAR DAM SAFETY	43
		14TMC-REFURBISH 900 B'FLY VLV2 INCL HYDR	14
		14TMC-REFURBISH 900 B'FLY VLV1 INCL HYDR	14
	2029-30	Study: 5yr Dam Comprehensive Inspection (Review of EAPs, O&M SOPs)	24
		Refurbish Valve - 900mm dia butterfly valves incl hydraulics	24
	2031-32	12TMC-REFURBISH HYDRAULICS	11
	2032-33	Replace Trashrack	25
	2033-34	09TMC-STUDY: 5 YEAR DAM SAFETY	42

Asset	*Year*	*Description*	*Value ($'000)*
	2034-35	Enhance-Install ladder restraint and safety system in Valve House and Inlet Tower *	30
		Upgrade position indicators on cone valves*	24
		Study: 5yr Dam Comprehensive Inspection (Review of EAPs, O&M SOPs)	24
	2035-36	12TMCXX REFURBISH PIPEWORK INT/EXT PAINT	49
Monto Weir	2016-17	14TMC-REFURBISH PROTECTION WRKS- MONTO	14
Mulgildie Weir	2011-12	Refurbish: Replace upstream screens and concrete works	12
		12TMCXX-INSTALL PLATFORM AT OUTLET VALVE	10
	2014-15	Refurbish Protection Works - rock mattress and stone pitching repairs	25
	2016-17	Refurbish: Replace upstream screens and concrete works	12
	2017-18	Refurbish outlet valve - paint and wrap	12
	2021-22	Refurbish: Replace upstream screens and concrete works	12
	2025-26	Replace Gate, 900X750Mm Slide	23
	2026-27	Refurbish: Replace upstream screens and concrete works	12
	2027-28	Replace Protection Works	67
	2030-31	Refurbish outlet valve - paint and wrap	12
	2031-32	Replace Structure	50
		Refurbish: Replace upstream screens and concrete works	12
Three Moon Ck Groundwater Dist	2032-33	Replace 136115A Cania Dam Hw	35
Youlambie Recharge Weir	2012-13	Replace Valve, 300Mm Gate	11
	2014-15	Refurbish protection works - stabilise & replace material, repair mattresses	12