QUEENSLAND COMPETITION AUTHORITY

Draft Report

SunWater
Irrigation Price Review: 2012-17
Volume 2
St George 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

Direction Notice

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 St George WSS for the 2012-17 regulatory period are outlined in Table 1 together with actual prices since 1 July 2006.

Table 1: Prices for St George 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 – Beardmore Dam/Balonne River											
Fixed (Part A)	13.56	14.44	15.12	15.60	16.08	17.64	18.73	19.19	19.67	20.17	20.67
Volumetric (Part B)	2.81	3.00	3.14	3.24	3.34	3.46	1.06	1.09	1.12	1.14	1.17
River – Thuraggi Watercourse											
Fixed (Part A)	13.56	14.44	15.12	15.60	16.08	17.64	18.73	19.19	19.67	20.17	20.67
Volumetric (Part B)	2.81	3.00	3.14	3.24	3.34	3.46	1.06	1.09	1.12	1.14	1.17

Note: 2011-12 prices include the interim increase of $1/ML in addition to CPI. 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. Also relevant is the Draft Report on the St George Distribution System.

Consultation

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

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. ST GEORGE WATER SUPPLY SCHEME

1.1 Scheme Description

The St George water supply scheme (WSS) is located near the town of St George. An overview of the key characteristics of this WSS is provided in Table 1.1.

Table 1.1: Key Scheme Information for the St George WSS

	St George WSS
Business Centre	Toowoomba
Irrigation Uses of Water	Cotton, wheat, grapes, melons, peanuts and small crops
Urban water supplies	The town of St George
Industrial Water Supplies	Abattoir and tourist accommodation

Source: Synergies Economic Consulting (2010).

The St George WSS has a total of 153 bulk customers (some of whom are also customers of the St George Distribution System, which draws its supply from St George). Medium and high priority water access entitlements (WAEs) are outlined in Table 1.2.

Table 1.2: Water Access Entitlements

Customer Group	*Irrigation WAE (ML)*	*Total WAE (ML)*
Medium Priority	72,794	81,575
High Priority	0	3,000
Total	**72,794**	**84,575**

Source: SunWater (2011).

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 St George WSS

Storage Infrastructure	*Capacity (ML)*	*Age (years)*
EJ Beardmore Dam	81,700	39
Jack Taylor Weir	10,100	58
Buckinbah Weir	5,120	43
Moolabah Weir	3,950	42

Sources: SunWater (2011).

The characteristics of the bulk water assets are:

(a) EJ Beardmore Dam is located on the Balonne River approximately 20 km upstream of St George. It releases water to a series of downstream weirs and supplies water to channel systems;

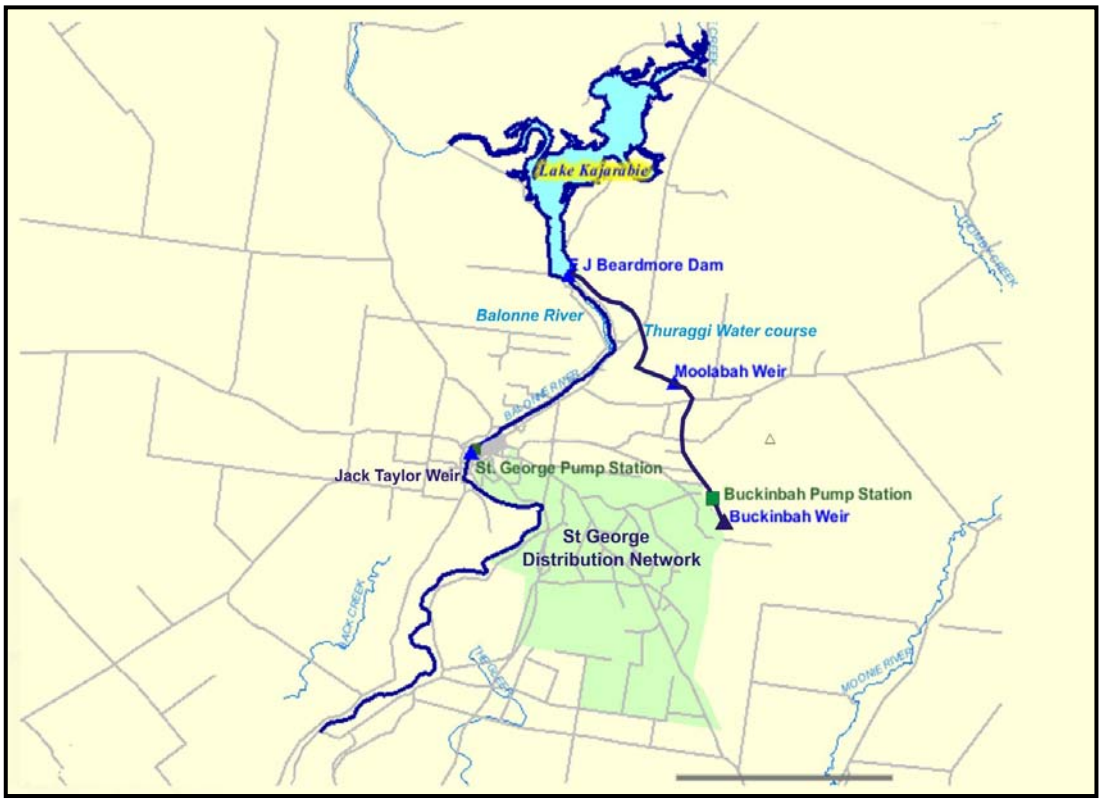
(b) Jack Taylor Weir is located on the Balonne River, downstream of Beardmore Dam and at the town of St George;

(c) Moolabah Weir is located on the Thuraggi watercourse at a high point in the middle of the original Thuraggi Lagoon and about 14.8 km downstream from the channel's inlet at Beardmore Dam; and

(d) Buckinbah Weir is located at the end of the original Thuraggi Lagoon about 27.4 km downstream from the Beardmore Dam outlet. The weir's storage outlet works are referred to as the Buckinbah Offtake Regulator. It is located approximately 1.5 km upstream of the weir's primary spillway across its right bank levee (SunWater, 2011).

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

Figure 1.1: St George WSS Locality Map



Source: SunWater (2011).

1.3 Network Service Plans

The St George WSS network services 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 St George 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 St George WSS:

(a) possible developments driven by the Murray Darling Basin Plan that is currently being developed. This plan, or subsequent changes over time, may have cost implications for the scheme or change the underlying assumptions used for forecasting;

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

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

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

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

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

(g) additional bulk water costs associated with installing and operating the low level pump station to supply the bulk water customers in the Thuraggi watercourse; and

(h) uncosted projects – the outlet works for Jack Taylor weir are not currently safe to operate and must be refurbished in order to satisfy Resource Operations Plan (ROP) requirements for releases from the weir. Moolabah weir requires remedial works to address structural issues. These projects are yet to be scoped but SunWater estimates that an additional cost of $1,000,000 is likely.

The renewals program includes expenditure on investigations for refurbishment of the St George headworks. The timing and the costs of this project is dependent on the outcome of the investigation and consultation with customers. The addition of $1,000,000 to the spend profile will add $60-$70,000 to the renewals annuity.

Other Stakeholders

Cotton Australia/Queensland Farmers' Federation (QFF) (2011a) questioned SunWater's statement that customers demand is a risk that cannot be managed by SunWater. Cotton

Australia/QFF further submitted that they agree that SunWater cannot be expected to take on all the risk of demand in any one year, but to suggest that SunWater has no role in the demand risk into the future is frustrating to say the least. Cotton Australia/QFF suggested that managing demand may be best addressed by setting prices based on 20% higher usage than historical averages.

Participants at the Round 1 consultation (May 2010) expressed concerns about the reliability of supply for irrigation.

St George Irrigators (2011) submitted that the prices imposed on St George water users should explicitly recognise any reductions in the total allocation due to intervention by government or any external body with statutory powers. They submitted that if intervention results in any reduction in the historical WAEs, SunWater should recover the gap from the agency that intervened.

St George Irrigators (2011) submitted that if the installation of new water meters is part of the reform process, then DERM should meet the cost of purchasing, installing and commissioning the meters.

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 to all WSSs. The proposed allocation of risks and the means for addressing them are outlined in below Table 2.1.

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

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

In the absence of detailed information for the Authority to review, the uncosted projects (g) and (h) above, relating to installing and operating the low level pump station in the Thuraggi watercourse, the remedial works at Moolabah Weir and the refurbishment works for Jack Taylor Weir, are not included in the renewals annuity.

The Authority recommends that any expenditure incurred on these items during the 2012-17 review period be carried forward for an end-of-period adjustment, subject to prudency and efficiency review unless Sunwater establishes a case for a price trigger.

The Authority notes Cotton Australia/QFF's proposed method to address demand risk. This proposal would require that the tariffs depart from the underlying costs which allocate volume risk to SunWater which SunWater is not able to manage.

To seek to impose an arbitrary risk on SunWater of the magnitude suggested may place an unacceptable level of risk upon SunWater. Moreover, SunWater may simply respond by seeking to reduce costs in a manner which reduces the standard of service at the scheme level. The Authority considers that SunWater has no ability to manage short term supply risks and that customer contracts require supply risk to be held by customers. The Authority considers that SunWater's customers have at least some ability to manage their water supply risks by holding

surplus entitlements with SunWater, sourcing alternative supplies and using temporary trade markets (see following chapter).

A service provider's revenues must cover the (efficient) cost of service provision to enable the service provider to continue their provision. If not, in a commercial context, a service provider would cease the delivery of those services. Short term supply and demand risks will therefore need to be managed, and their cost borne, by customers.

The establishment of a two-part tariff that aligns the costs and prices better manages risk and avoids these complications.

Rather than estimating future demand, the Authority recommends that short term volume risks should be assigned to customers through a tariff structure that recovers all fixed costs through fixed charges and variable costs through the volumetric charges. Costs that vary with water use (variable) are addressed in more detail in the chapter on operating expenditures.

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).

In response to St George Irrigators, the Authority recognises that SunWater is exposed to risk associated with government and regulatory imposts beyond its control. These costs are generally considered to be outside the control of service providers and may be eligible for cost pass through upon application by SunWater.

In relation to costs for the installation of new meters, these are outside the scope of this review.

3. PRICING FRAMEWORK

3.1 Tariff Structure

Introduction

During the 2005-06 price negotiations, it was generally agreed to adopt a 70:30 ratio of fixed costs to variable costs. However, the St George Tier 2 group requested that additional river tariff scenarios be tabled for discussion.

Three tariff scenarios were presented to all irrigators (70:30, 80:20 and 85:15 ratios of fixed costs to variable costs) to decide on a preferred tariff structure by means of ballot vote. The results from the ballot supported a tariff structure where the Part A fixed charge was set at 85% and Part B variable charges at 15% of total revenues in this scheme.

Stakeholder Submissions

SunWater

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

Other Stakeholders

Cooinda Cotton Co. (2010) submitted that during the height of the recent drought they paid $180,000 in fixed charges for water that did not exist. They considered that this fixed charging policy is clearly unsustainable in the St George Irrigation Area, but is another SunWater charge that they have never had any input to.

St George Irrigators (2010) submitted that at some critical point, the proportion of total costs taken as a fixed charge will overwhelm any incentive felt by SunWater to actually maintain the network and deliver water to customers.

Cotton Australia (2011a) submitted that if SunWater charges for 100% of bulk WAEs it should be charged in arrears not in advance as is currently the case.

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 Cooinda Cotton's submission regarding paying a fixed charge when water is not available, the Authority notes that under current legislative and contractual arrangements (and the Ministerial Direction), customers must bear all the costs of water supply incurred by SunWater, irrespective of whether it is made available or not (provided the costs of supply are efficient and prudent).

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 St George WSS are identified in Table 3.1.

Table 3.1: Permanent and Temporary Water Traded (ML)

	2002-03	*2003-04*	*2004-05*	*2005-06*	*2006-07*	*2007-08*	*2008-09*	*2009-10*
Permanent water traded	0	0	0	0	0	0	0	0
Temporary water traded	8,301	5,191	10,797	9,585	12,446	6,799	12,054	8,501

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

In response to St George Irrigators' submission that SunWater may not have an incentive to deliver water to customers, the Authority considers that, in a commercial environment, a service provider will continue to increase supply until the marginal cost and marginal revenue are equal. In a regulatory environment with the volumetric charge set to equal variable costs, the incentive to increase supply occurs where the service providers envisages that cost per unit may decrease with increased supply, or where further cost savings are identified as being feasible.

Notwithstanding the particular characteristics of the variable costs in particular instances, 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).

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

The Authority further notes that if SunWater charges for 100% bulk WAEs in arrears, rather than in advance, the additional financing costs arising from an increased need for working capital will need to be included in prices. Therefore, the Authority proposes to retain the existing arrangements of charging Part A in advance.

3.2 Water Use Forecasts

Introduction

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

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, impacts of trading and scheme specific issues (SunWater, 2006a).

For the St George WSS, SunWater (2006b) assumed a water usage forecast of 95% of WAE in the river system. Water usage for high and medium priority irrigation WAEs was not separately identified (SunWater, 2006b).

Stakeholder Submissions

SunWater

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

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

SunWater's usage forecasts for 2012-17 are made with regard to historic averages over an eight-year period and the usage forecast applied for the 2006-11 price path. However, SunWater advised that usage of high priority and medium priority irrigation water cannot be separately identified, as holders of high priority WAEs also hold medium priority WAEs which passes through the same meter.

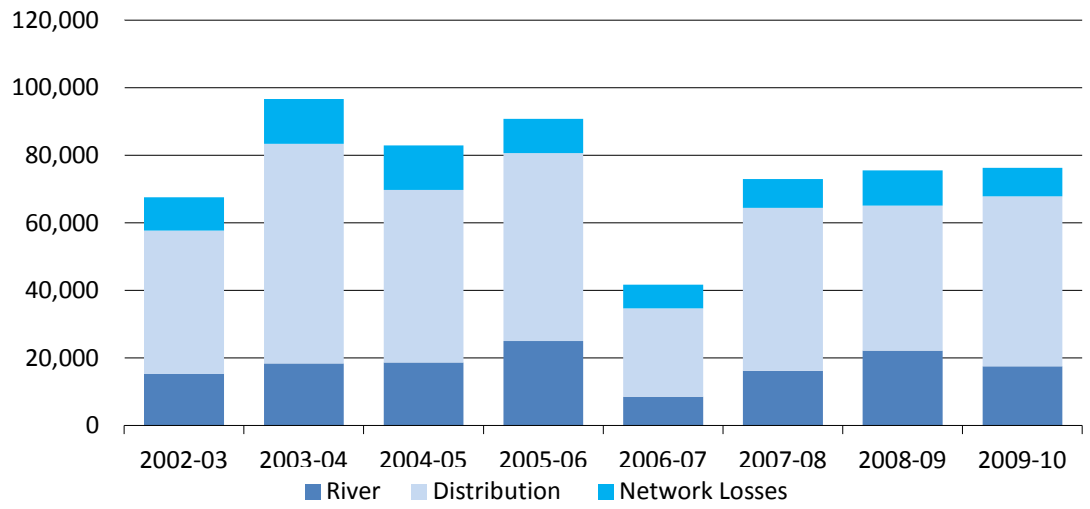
Based on the last eight years observations, SunWater has forecast use as follows:

(a) at a whole scheme level (all sectors) – an average of 84% of total WAEs (including SunWater's distribution loss WAEs and its other WAEs); and

(b) for the irrigation sector only – an average of 85% of irrigation WAEs. This compares with the use assumption adopted in the 2006-11 price paths of 95% of WAEs.

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

Figure 3.1: Water Usage for the St George WSS (ML)



Source: SunWater (2011)

Other Stakeholders

Participants at the Round 1 consultation showed preference for assessment of usage on historical basis rather than projected demand.

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 proposed in SunWater's NSPs.

The 2006-11 SunWater Irrigation Price Paths Final Report (SunWater, 2006b) nominated two tariff groups for the river segment of the St George WSS:

(a) River – Beardmore Dam/Balonne River; and

(b) River – Thuraggi Watercourse.

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.

The Authority notes that submissions by St George irrigators that the Thuraggi Watercourse is part of the St George WSS are addressed in section 3.8 of the St George Distribution System Draft Report.

4. RENEWALS ANNUITY

4.1 Introduction

Ministerial Direction

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

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

Previous Review

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

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

(a) a detailed asset management plan, based on asset condition, that defined the timing and magnitude of renewals expenditure; and

(b) an asset restoration reserve (ARR) to manage the balance of the unspent (or overspent) renewals annuity (including interest).

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

The allocation of the renewals annuity between high and medium priority users was based on Water Pricing Conversion Factors (WPCFs). Separate ARR balances were not identified for bulk and distribution systems.

Issues

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

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

(a) the establishment of the opening ARR balance (at 1 July 2012), which requires:

  (i) whether renewals expenditure in 2007-11 was prudent and efficient. This affects the opening ARR balance for the 2012-17 regulatory period;

  (ii) the unbundling of the opening ARR balance for bulk and distribution systems (where applicable);

  (iii) the extension of the opening ARR balance (calculated for 1 July 2011) to 1 July 2012 to account for the adjusted timelines specified in the amended Ministerial Direction;

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

(c) the methodology for apportioning bulk and distribution renewals between medium and high priority WAEs; and

(d) the methodology to calculate the renewals annuity.

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

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

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

It was therefore not practicable within the timeframe for the review, nor desirable given the potential costs, 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 St George WSS (including the St George Distribution System) was $1,294,000.

The Authority has accepted SunWater's unbundled opening ARR balance for the St George WSS (excluding the St George Distribution System) of $837,000.

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

In October 2011, Indec advised that it had uncovered actual renewals expenditure for 2000-06. The Authority has not been able to review this information or quality assure it for the purposes of the Draft Report, but intends to do so for the Final Report.

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 paths. The Authority has also sought to compare

the original expenditure forecasts underlying the 2006-11 price paths with actual expenditure, to establish the accuracy of SunWater's forecasts.

Submissions

SunWater

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

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

	2006-07	***2007-08***	***2008-09***	***2009-10***	***2010-11***
Past (Actual) Renewals Expenditure	690	280	158	419	430

Source: SunWater (2011 an).

Other Stakeholders

Cooinda Cotton Co. (2011), Cotton Australia (2011) and the participants at the Round 2 consultation all expressed concerns that irrigators are experiencing significant negative opening ARR balances (as at 1 July 2012) due to actual renewals expenditure exceeding forecast renewals expenditure for 2006-11.

Cooinda Cotton Co. submitted that provisions made for refurbishment of the scheme under previous price paths are more than adequate, if SunWater cannot work within the given parameters then it should not be given the task to operate the scheme. Cooinda Cotton Co. further submitted that it is unacceptable for St George irrigators to wear the cost of SunWater's inability to manage its budget, refurbishment program or costs.

Participants at the Round 2 consultation considered that forecasts of renewals expenditure are similar to a budget and SunWater needs to operate within this budget.

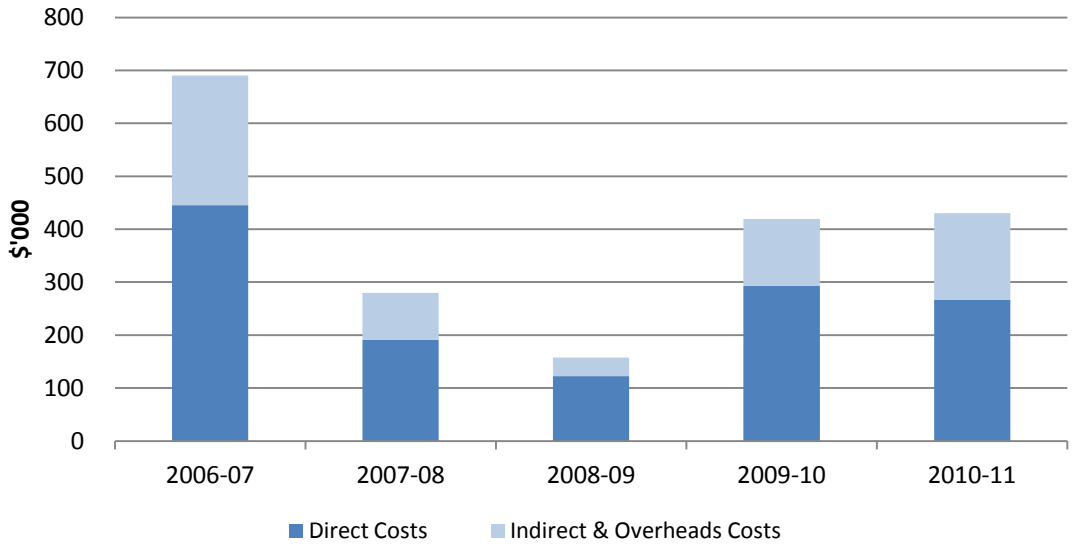
St George Irrigators (2011) submitted that the 2011 renewals expenditure listed in the NSP is a serious anomaly with the rates forecast by SunWater and projections for the previous price path and the NSP provides no explanation of this figure or how it might be managed in practice. They further submitted that renewal costs are severely inflated by the legacy of expenditure in 2011.

Authority's Analysis

Total Renewals Expenditure

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

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



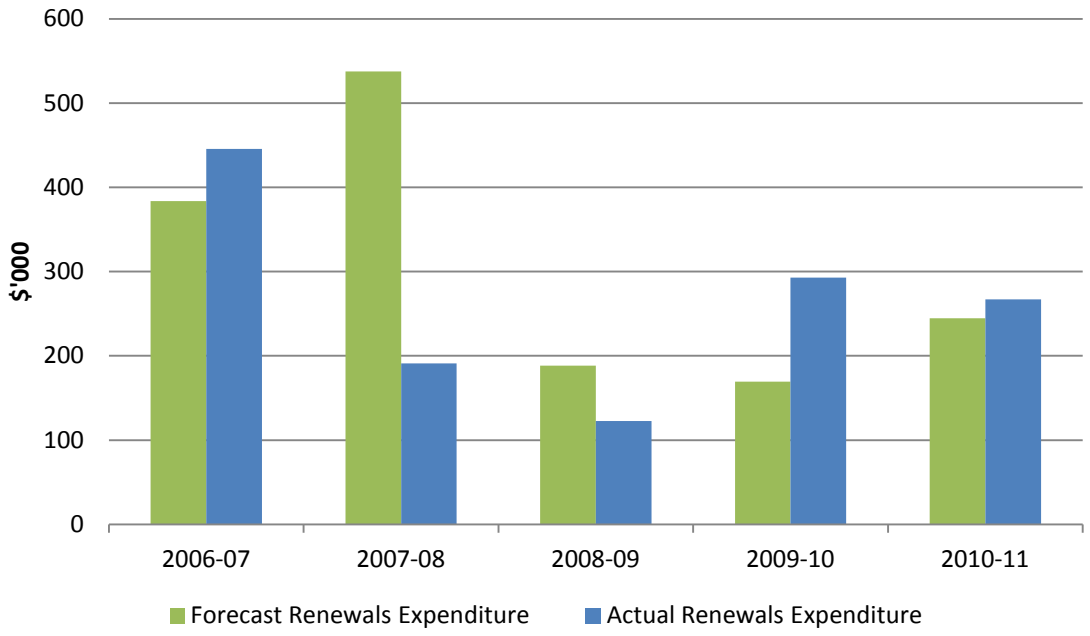
Note: The estimates reflect the most recent information provided by SunWater to the Authority in September 2011.
Source: Indec (2011d)

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 St George WSS for 2006-11 is shown in Figure 4.2.

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



Source: Forecast (Indec, 2011), Actual (SunWater, 2011k).

Actual renewals expenditure was approximately $205,000 less than forecast over the period.

GHD was appointed to review the prudency and efficiency of past renewals projects.

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

Item 1: Various Renewals Projects 2007-2011

SunWater

SunWater undertook the following renewal projects in the St George WSS over 2006-11 (Table 4.2) in real terms as at 2010-11.

Table 4.2: Renewals Expenditure Projects 2006 to 2011 (Real $)

Item	*2006-07*	*2007-08*	*2008-09*	*2009-10*	*2010-11*
Refurbishment of Gate 12 at EJ Beardmore Dam	57,649*	-	-	-	-
Refurbish the EJ Beardmore Dam gates No 8, 9 and 10	-	-	-	88,498	-
Installation of Buoy-lines for both Jack Taylor Weir and EJ Beardmore Dam	-	-	-	139,528	-
Removal of contaminated material from the Jack Taylor Weir	-	-	-	51,577	-

*Note: * The GHD report noted this cost as $58,645 but SunWater data indicates the cost is $57,649 and the previous figure relates to the Thuraggi Outlet works (see Item 2 below). Costs include indirect and overhead costs. Source: GHD (2011).*

Other Stakeholders

No other stakeholders have commented on these items.

GHD's Review

GHD reviewed the projects in Table 4.2 to determine the drivers for the projects, the rationale for scheduling and verification of the expenditure values. GHD stated the following:

(a) refurbishment of Gate 12 at EJ Beardmore Dam was needed to restore the paint coating and undertake planned maintenance on the gate axles;

(b) refurbish the EJ Beardmore Dam gates No 8, 9 and 10 was based on the need to restore paint coatings on the gates on a planned restoration frequency of seven years;

(c) installation of Buoy-lines for both Jack Taylor Weir and EJ Beardmore Dam was required for compliance to occupational health and safety obligations and SunWater's duty of care to the public; and

(d) removal of contaminated material from the Jack Taylor Weir sandblasting compound was required to correct past poor environmental practice by removing hazardous materials in the gate refurbishment area.

GHD concluded that the expenditures on each project were within an acceptable range of the likely cost estimates determined by engineering judgement. GHD stated that the quantities and

unit rates for each project were not available and therefore a more detailed analysis was not possible.

GHD considered that the timing of each project was within the defined frequency for planned maintenance tasks and supported by condition and risk assessments recorded in the Systems, Applications and Products (SAP) Plant Maintenance (PM) system. The engineering assessments were supported by site inspections of each of the assets refurbished in the above list.

Authority's Analysis

The Authority notes GHD's recommendation that for the sample of reviewed renewals items over 2006-11, there was insufficient information to determine whether these items were efficient.

Item 2: Modifications to the Thuraggi Outlet

SunWater

SunWater undertook modifications to the Thuraggi Outlet at a cost of $58,645 in 2006-07.

Other Stakeholders

Cooinda Cotton Co. (2011) and participants at the Round 2 consultation submitted that some of the expenditure incurred in 2006-07 was due to the installation of a permanent pump station and modifications to the Thuraggi outlet. They considered that the Thuraggi outlet renewals expenditure incurred in 2006-07 should not be incorporated into the renewals annuity because funding associated with establishing Thuraggi outlet was met through the public auction of water allocations in 1989.

In support of their view, Cooinda Cotton Co provided a copy of Hansard dated 8 November 1990 in which the member for Warwick, Mr Des Booth, has quoted from the 1989 Annual Report of the Water Resources Commission which refers to the public auction of water allocations in 1989. This quote indicates that the auction raised $1.159 million to, in part, construct a pump station at EJ Beardmore Dam to secure the supply of the water allocations auctioned (Booth, 1990).

GHD's Review

GHD reviewed the modifications to the Thuraggi Outlet to determine the drivers for the projects, the rationale for scheduling and verification of the expenditure values. The work was required to restore aging assets and improve the operational efficiency of the outlet.

GHD concluded that the expenditures on each project were within an acceptable range of the likely cost estimates determined by engineering judgement. GHD stated that the quantities and unit rates for each project were not available and therefore a more detailed analysis was not possible.

GHD considered that the timing of each project was within the defined frequency for planned maintenance tasks and supported by condition and risk assessments recorded in the SAP-PM system. The engineering assessments were supported by site inspections of each of the assets refurbished in the above list.

Authority's Analysis

The Authority notes GHD's recommendation that there was insufficient information to determine whether the renewals expenditure item was efficient.

The Authority notes the views of Cooinda Cotton Co. (2011) and participants at the Round 2 consultation that renewals expenditure incurred in 2007 associated with modifications to Thuraggi outlet should have been met through the public auction of water in 1989.

The Authority notes that DERM (1994) report:

(a) that in 1987 a discussion paper was released proposing to make available an additional 21,400 ML from the EJ Beardmore Dam. This was to be achieved through reducing reliability from 91% to 88%, reassessing delivery efficiency and the purchase of pumps to enable water to be supplied to channels when storage was at low levels; and

(b) based on this assessment, 26,100 ML of additional water (rather than the originally proposed 21,400 ML) was made available and sold by auction in 1989.

The Authority also notes the Annual Reports of the Water Resources Commission which:

(a) confirms that planning was undertaken to auction additional water and that proceeds would be used to contribute to the cost of a permanent pump station at the EJ Beardmore Dam (Water Resources Commission, 1989); and

(b) reports that the auction occurred in November 1989 with the proceeds of $1.159 million to be used, in part, to construct a major pump station on the EJ Beardmore Dam to secure these supplies (Water Resources Commission, 1990).

The Authority notes section 1.1 b) of the Ministerial Direction which requires the Authority not to consider, for the purpose of pricing, assets commissioned prior to 1 July 2012. The implications of section 1.1 b) are that regardless of the value and timing of SunWater's capital expenditure program, no assets commissioned prior to 1 July 2012 feature in prices. This includes costs associated with establishing Thuraggi outlet.

At issue, therefore, is whether proceeds from the auction of allocations in 1989 were meant to off-set this renewals expenditure.

No direct reference is made in DERM's publications or in the Annual Report of the Water Resources Commission, in relation to using the funds from the 1989 auction for the establishment and maintenance of Thuraggi outlet into the future. Further, no such evidence has been brought to the Authority's attention by stakeholders.

The Authority concludes, therefore, that funds made available as a result of the auction in 1989 were not intended to maintain Thuraggi outlet into the future. Accordingly, the Authority concludes that the expenditure incurred in 2007 constitutes renewals expenditure.

Conclusion

The Authority notes GHD's finding that there was insufficient information to determine whether the past renewals expenditure items for this scheme was efficient. As noted in Volume 1, after a consideration of all its consultants' reviews, 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 summarised in Table 4.3.

Table 4.3: Review of Past Renewals Expenditure 2006-11 (Real $)

Item	*Date*	*SunWater*	*Authority's Findings*	*Recommended*
Sampled Projects				
1. Refurbish EJ Beardmore Dam Gate 12	2006-07	$57,649	Insufficient information	10% saving applied
2. Refurbish EJ Beardmore Dam gates No 8, 9 and 10	2009-10	$88,498	Insufficient information	10% saving applied
3. Install Buoy-lines at Jack Taylor Weir and EJ Beardmore Dam	2009-10	$139,528	Insufficient information	10% saving applied
4. Removal of contaminated material, Jack Taylor Weir	2009-10	$51,577	Insufficient information	10% saving applied
5. Thuraggi Outlet modifications	2006-07	$58,645	Insufficient information	10% saving applied
Non Sampled Projects				10% saving applied

Note: Costs include indirect and overhead costs. Source: SunWater (2011), GHD (2011), SKM (2011).

4.4 Opening ARR Balance (at 1 July 2012)

Stakeholder Submissions

SunWater

SunWater indicated that the renewals opening ARR balance for 1 July 2011 was $191,000 for the St George WSS. This estimate reflects the most recent information provided by SunWater to the Authority in September 2011. It differs from the NSP, which had an ARR balance of negative $468,000.

Other Stakeholders

Participants at the Round 2 consultation considered that despite being told during the previous price reviews that the program of renewals expenditures would provide a viable scheme, the negative balance suggests that this has not been the case.

St George Irrigators submitted that for the period ahead, SunWater must not unilaterally commit St George irrigators to any capital expenditure projects that cannot be funded from the asset renewal reserves. They considered that while these 'reserves' can be taken to include new funding expected within a year or so following the project's completion, SunWater is not authorised to take the ARR into debt.

Authority's Analysis

Based on the Authority's assessment of the prudency and efficiency of past renewals expenditure, and the proposed methodology for unbundling ARR balances, the recommended opening ARR balance for 1 July 2011 for the St George WSS is $368,000.

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 for the period consistent with the Authority's recommendations detailed in Volume 1.

To establish the closing ARR balance as at 30 June 2012 of $343,000 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.

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 expenditures 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.

Prudency and Efficiency of Forecast Renewals Expenditure

Submissions

SunWater

SunWater's proposed 2011-16 renewals expenditure for the St George WSS in real (2010-11) terms is presented in Table 4.4 as provided in its NSP (submitted prior to the Government's announced interim prices for 2011-12).

Table 4.4: Forecast Renewals Expenditure 2011-16 (Real $'000)

Facility	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*
EJ Beardmore WTP	15	12	28	-	46
EJ Beardmore Dam	148	501	226	353	257
Jack Taylor Weir	299	129	339	262	131
Moolabah Weir	250	-	-	-	26
Total	**712**	**642**	**593**	**615**	**460**

Source: SunWater (2011)

The major items are:

(a) EJ Beardmore Dam Water Treatment Plant (WTP) – replace building, security fence and equipment at an estimated cost of $15,000 in 2011-12. Due to their condition, a building, security fence and water treatment equipment will be replaced;

(b) Jack Taylor Weir – reinstate outlet works at an estimated cost of $282,000 in 2011-12. The weir outlet requires remedial works to meet the requirements of the Lower Balonne Resource Operation Plan. The existing 450mm diameter gate valves will be replaced and automated;

(c) Moolabah Weir – undertake remedial work on facing slabs at an estimated cost of $250,000 in 2011-12. The earth fill under the facing slabs has been partially eroded due to high flow events and requires remedial work to maintain the weir's structural integrity;

(d) EJ Beardmore Dam WTP – investigate future options for the ongoing requirements of this water treatment plant at an estimated cost of $12,000 in 2012-13;

(e) Jack Taylor Weir – refurbish gates at an estimated cost of $115,000 in 2012-13. Gates 9 to 13 will be sandblasted and painted to provide long term corrosion protection;

(f) EJ Beardmore Dam – refurbish hoisting mechanisms at an estimated cost of $130,000 from 2012-13 to 2013-14. The hoisting mechanisms on the twelve gates will be refurbished to maintain their working condition;

(g) EJ Beardmore Dam – refurbish spillway gates at an estimated cost of $280,000 from 2012-13 to 2015-16. Five spillway gates will be refurbished to provide long term protection from corrosion. The need for this work has been established by condition assessment;

(h) EJ Beardmore Dam WTP – automate town water supply at an estimated cost of $28,000 in 2013-14. The pump that supplies potable water to St George will be automated to allow remote operation;

(i) Jack Taylor Weir – carry out repairs to weir at an estimated cost of $272,000 in 2013-14. Damage to the wingwalls, retaining walls, apron slabs and rock pitching will be repaired to maintain the weir's structural integrity;

(j) EJ Beardmore Dam WTP – replace tank and monitoring equipment at an estimated cost of $46,000 in 2015-16. The high level water supply tank and treatment plant monitoring system will be replaced due to their condition; and

(k) Moolabah Weir – replace gate at an estimated cost of 26,000 in 2015-16. Based on its condition, this gate will be replaced.

The major expenditure items from 2006 are:

(a) repairs to crest at Moolabah Weir at an estimated cost of $249,000 in 2011-12;

(b) x-ray examination of winch ropes at EJ Beardmore Dam at an estimated cost of $232,000;

(c) upgrade screens and guides at Moolabah Weir at an estimated cost of $28,000 in 2022-23;

(d) replace trash screen at Moolabah Weir at an estimated cost of $73,000 in 2022-23;

(e) replace winch at Jack Taylor Weir at an estimated cost of $2,103,000 in 2022-23; and

(f) reoccurring expenditure to replace winch at EJ Beardmore Dam at an estimated cost of $1,411,000 in 2026-27, $1,410,000 in 2027-28, $1,417,000 in 2028-29 and $1,406,000 in 2029-30.

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

Participants at the Round 2 consultation expressed concern at implications of increases in renewals expenditure for prices. Participants considered that SunWater has not provided adequate information on the renewals program for the current price path. Participants also submitted that there is a need for any unidentified flood costs to be covered by insurance or SunWater and not end up as additional renewals spend.

Cooinda Cotton Co. (2011) submitted that there is much secrecy surrounding the SunWater planned 25 year maintenance and refurbishment program and its associated costs, such that the Authority's own consultants must sign confidentiality documents to sight these plans.

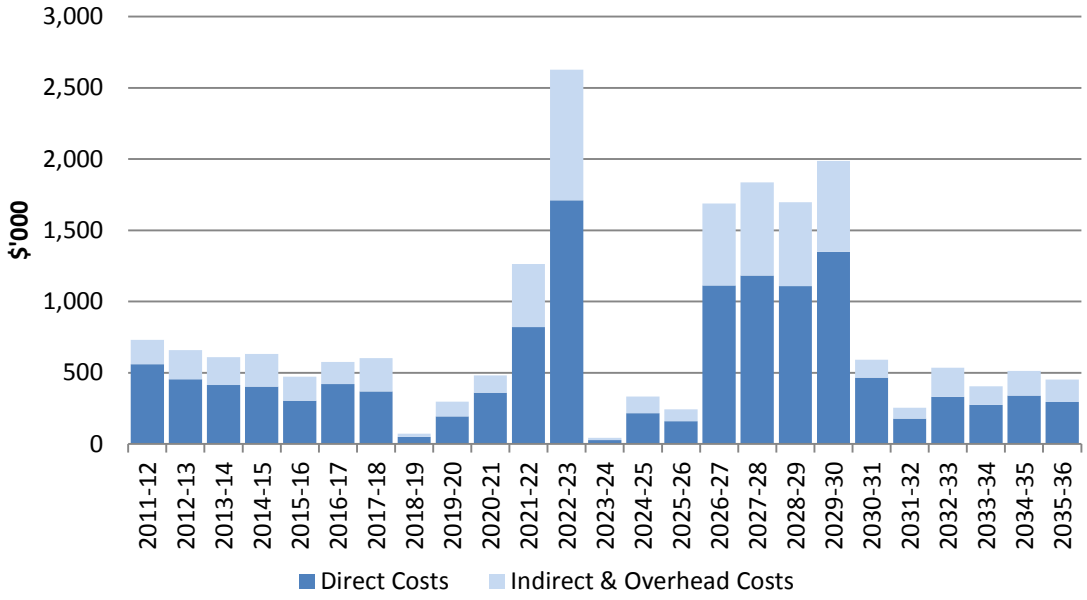
Cooinda Cotton Co. and participants at the Round 2 consultation further submitted that they have enormous concerns that desperately required projects such as the reinstatement of flood protection gates are being ignored by SunWater in preference to *pet* projects of Brisbane based managers.

Authority's Analysis

Total Costs

SunWater's proposed renewals expenditure for 2011-36 for the St George WSS in real (2010-11 dollar) terms is shown in Figure 4.3. This reflects the most recent renewals information provided by SunWater to the Authority in September, and differs from the NSP. The Authority has identified the direct cost component of this expenditure. The indirect and overheads component of expenditure relating to these projects are further reviewed in Chapter 5 – Operating Costs.

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



Source: SunWater (2011)

In response to Cooinda Cotton Co. and participants at the Round 2 consultation regarding SunWater not providing information on the renewals program, the Authority notes that forecast renewal expenditure items greater than $10,000 in value, for the years 2011-12 to 2035-36, are presented in **Appendix A**.

The Authority has investigated the renewals and refurbishment works that need to be undertaken by SunWater to maintain the scheme's assets. However, the Authority's investigation has focused on items identified in SunWater's NSP and has not sought to identify other works that may be required. In regards to the reinstatement of flood protection gates, the Authority cannot comment on the requirements for these works.

The Authority notes that in principle, insurance payments to fund replacements should be offset against expenditure. No data on actual flood insurance or payouts has been provided for the Draft Report.

Item Review

GHD reviewed the prudency and efficiency of the total costs (including indirect and overhead costs) of a sample of items.

As noted in Volume 1, GHD adopted a different approach to the other scheme consultants and undertook a high level process review of a large number of projects rather than a more detailed review of a smaller number of projects.

GHD found SunWater's asset planning process to generally meet good industry practice (as did the other consultants in general). Nevertheless, as a result of the lack of detailed review of any specific renewals expenditure items, the Authority has applied a general 10% cost saving to SunWater's proposed renewals expenditure items reviewed by GHD alone.

The Authority also requested that SKM review an additional item. The assessed future renewals projects are discussed below.

Item 1: EJ Beardmore Dam Renewals Projects 2011-12 to 2015-16

SunWater

SunWater proposed the following renewal projects for the EJ Beardmore Dam (Table 4.5).

Table 4.5: EJ Beardmore Dam Renewals Expenditure 2011-12 to 2015-16 (Real $'000)

Item	*Driver*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*
12SGAXX Major Service On Diesel Motor	Preservation	6	-	-	-	-
12SGAXX Patch Paint U/S Face &CP Maint	Condition	8	-	-	-	-
12SGAXX Replace Gate	Condition	-	217	-	-	-
13SGAXX Study: 5yr Dam Safety Inspection	Compliance	-	88	-	-	-
14SGAXX Maintain Road SW Houses/Office	Condition	-	-	7	-	-
14SGAXX Study:Refurb All Cables & Cblwys	Condition	-	-	17	-	-
Clean foundation drains located in dam gallery	Condition	-	-	-	60	-
Refurbish: Repair scouring and undermining of dental concrete in spillway apron and dissipater area	Condition	-	-	-	63	-
Refurbish: Full paint upstream face and CP maintenance	Condition	-	-	-	50	-
Refurbish: Upstream Face full paint and CP maintenance	Condition	-	-	-	-	150
Refurbish: Downstream face Full blast and paint	Condition	-	-	-	50	50
Refurbish: Regrade embankment to design profile	Condition	53	-	-	-	-
Study: 5yr Dam Comprehensive Inspection (Review of EAPs, O&M, SOPs)	Compliance	-	-	25	-	-
Upgrade Thuraggi metering		-	-	38	-	-

Note: Costs include indirect and overhead costs. Source: GHD (2011).

Other Stakeholders

No other stakeholders have commented on these items.

GHD's Review

GHD reviewed the projects listed in Table 4.5 in SunWater's SAP-PM and Works Management System (WMS). GHD considered that the drivers for each project were sound, and the timing and cost of the works appear to be prudent.

GHD provided a summary of its investigation into these projects:

(a) servicing of the diesel motor is a planned maintenance task specified by the supplier of the low water bypass pumps and required to preserve the asset and comply with the suppliers operations and maintenance requirements;

(b) patch painting of the dam gate upstream face and maintenance of the road to the office is needed to protect and preserve these assets;

(c) replacement of the gate is needed to correct problems with the seals and travel alignment;

(d) the dam safety inspections are a statutory compliance requirement and mandatory within the planned cycles over the five-year price path;

(e) the study into refurbishment of the cables and cableways is a condition assessment requirement to determine what work is needed to preserve the assets and confirm their condition by non-destructive testing;

(f) cleaning out the foundation drains is required to protect the structural integrity of the dam; and

(g) the need for repairs to the dental concrete on the spillway apron and regrading of the embankment was evident during the site inspection and the timing was assessed as appropriate.

GHD further stated that most of the projects planned beyond 2013-14 were based on planned maintenance cycle based on the past experience with the life of the assets. For example, painted steel will need to be stripped and reapplied every seven years which is the life of the paint coatings.

GHD visited the EJ Beardmore Dam on 2 March 2011 and observed the following:

(a) the spillway gates are in excellent condition with minor seepage occurring at a few of the gate seals. SunWater has been progressively refurbishing the gates. The facilities are generally in good condition with normal maintenance requirements for the embankment including, cutting of grass and removal of grass on the crest, as well as grading of the crest to remove wheel rutting;

(b) some of the road barrier on the left abutment is showing signs of movement with significant tilting towards the downstream side, which may be associated with insufficient compaction of the material where the posts are located based on anecdotal advice from the operator. The concrete structure for the spillway gates is generally in good condition, although some rusting of the cross bolts for the spillway roller gate wheel paths is occurring and the bolts should be tested to ensure that they are structurally sound and repainted as necessary as part of the preventive maintenance;

(c) recent repairs have been completed for the rip rap on the right abutment to prevent erosion damage of the embankment. The building housing the diesel generator and the incoming power lines are located at a low level in relation to anticipated floods and have resulted in the inability to use the generator as well as a requirement to isolate the mains power. These aspects may have significant operational constraints for the gates, resulting in a high risk should the gates become inoperable during a flood due to loss of power supply;

(d) significant differential movement has occurred in the past at the wing walls for the embankment on both abutments. This movement is being monitored and markings on the wall indicate that this movement is stable. The instrumentation installed at the dam is in excellent condition and the piezometers have recently been refurbished; and

(e) the recent floods had highlighted the need to move the diesel generator and Dam Office/Workshop Building. The toilet block was extensively damaged and will need to

be demolished. A replacement flood tolerant which is not on the forward implied works program structure is being considered.

GHD considered that the site inspections verified the following items in the forward works program:

(a) major servicing on the diesel motor (2011-12);

(b) regrading of the embankment (2011-12);

(c) clean out the foundation drains (2014-15);

(d) repairs to the concrete on the spillway apron (2014-15);

(e) refurbishment of the gates and cathodic protection maintenance (2014-15 to 2015-16); and

(f) refurbish the trash racks.

GHD generally concluded that the forecast renewals expenditure was assessed as efficient and prudent.

Authority's Analysis

As noted above, the Authority has applied a general 10% cost saving to renewals items reviewed by GHD alone.

Item 2: EJ Beardmore Dam Waste Treatment Plant Renewals Projects 2011-12 to 2015-16

SunWater

SunWater proposed the following renewal projects for the EJ Beardmore Dam WTP (Table 4.6).

Table 4.6: EJ Beardmore Dam WTP Renewals Expenditure 2011-12 to 2015-16 (Real $'000)

Item	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*
Replace building, security fence and equipment	15	-	-	-	-
Investigate future options	-	12	-	-	-
Automate town water supply	-	-	28	-	-
Replace tank and monitoring equipment	-	-	-	-	46

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

Other Stakeholders

No other stakeholders have commented on these items.

GHD's Review

GHD noted that the EJ Beardmore Dam WTP does not supply the town of St George as stated in the NSP, but services the recreation facilities, three houses for the dam operators, an office and depot complex and the camping grounds.

The SunWater Operations Manager South advised GHD that the need for the WTP had been reviewed and SunWater had decided to install rainwater tanks and decommission the WTP. As a result, the works proposed for the WTP may be deferred.

GHD did not review the renewal projects for the EJ Beardmore Dam WTP over this period in SunWater's SAP-PM and WMS.

Authority's Analysis

The Authority notes that SunWater has reviewed the need for the EJ Beardmore Dam WTP and has decided to install rainwater tanks and decommission the WTP. The Authority notes that renewals expenditure for this purpose has not been included and no timeframe has been provided as to when the WTP will be decommissioned.

In principle, any renewals expenditure that is no longer required due to closure of the EJ Beardmore Dam WTP will be excluded from the renewals annuity. SunWater is yet to advise the Authority of any required changes due to the installation of rainwater tanks and decommissioning of the treatment plant. An end-of-period adjustment for this purpose is anticipated.

There is insufficient information to conclude whether the renewal expenditure for the EJ Beardmore Dam WTP over 2011-12 to 2012-16 is prudent or efficient.

Item 3: Jack Taylor Renewals Projects 2011-12 to 2015-16

SunWater

SunWater proposed the following renewal projects for the Jack Taylor Weir is outlined below in Table 4.7.

Table 4.7: Jack Taylor Weir Renewals Expenditure 2011-12 to 2015-16 (Real $'000)

Item	*Driver*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*
12SGAXX Blst & Paint Gate Guides/Inst CP	Condition		114			
Carry out repairs as per design (2011) to wingwalls, retaining walls, apron slabs and rockpitching	Condition			272		
Refurb of hoist mechanisms on gates	Condition				113	131
Replace Control Equipment	Condition				91	

Note: Costs include indirect and overhead costs. Source: GHD (2011).

Other Stakeholders

Participants at the Round 2 consultation submitted in general that there is a need for any unidentified flood costs to be covered by insurance or SunWater and not end up as additional renewals spend.

GHD's Review

GHD reviewed the projects listed in Table 4.7 in SunWater's SAP-PM and WMS. GHD considered that the drivers for each project were sound, and the timing and cost of the works appear to be prudent.

GHD assessed the repairs on the Jack Taylor Weir wing walls, retaining walls, apron slabs, and rock pitching, estimated to cost $272,000 in 2013-14, to be under-estimated from the extent of the damage observed during the site inspection. GHD expected the restoration work on the Weir to be well above this estimate. How much additional damage occurred during the 2011 floods is not known, but may explain the difference between the current estimate and the site observations. During the field visit, GHD also identified the need to repair the road deck balustrades, which did not appear to be included in the forward works program.

The refurbishment of the hoist mechanisms on the gates and control equipment is planned to coincide with the end of their useful life. GHD supported the planned works based on the age and type of hoists and control equipment sighted during the site inspection.

GHD visited the Jack Taylor Weir on 2 March 2011 and observed the following:

(a) the downstream erosion protection has been damaged by recent floods and the rock facing has been undermined in a number of areas. The wing walls on the downstream embankment have settled and cracked. The balustrades on both sides of the road deck have been damaged through vehicle collision and more significantly, a number of the concrete posts have been damaged by flood debris (logs) impacting the posts and will require repair. This vehicle damage has been occurring over many years;

(b) the right abutment asphalt road surface was lifted off the embankment in areas during the recent floods and has been repaired. Similarly, erosion damage on the left abutment upstream area has been repaired. The left abutment road surface is suffering from structural failure of the sub-grade leading to 'pumping' of fines from the embankment through the cracked road surface. The security fencing on the left bank has been damaged by the recent floods and some material eroded from the bank has been deposited against the fencing, which will require repair;

(c) the spillway gates were successfully operated during the recent floods, which indicate that the operation and maintenance of the gates is generally acceptable and the operators are aware of the operating procedure; and

(d) the Weir has an outlet pipe with a gate valve at the base of the central gate. Access to the valve requires an operator to cross the spillway and enter a slip hazard area, so the outlet was sealed some years ago. SunWater plans to install a new outlet on the western side, which will be safely accessible from the embankment.

GHD considered that the site inspections verified the following items in the forward works program:

(a) repainting of the gate guides (2012-13);

(b) repairs to the wing walls, retaining walls, apron slabs, rock-pitching, balustrade and security fencing. The cost estimate for this work $272,000 in 2013-14 is considered far too low for the extent of damage; and

(c) refurbishment of the hoist mechanisms (2014-15 to 2015-16).

GHD generally concluded that the forecast renewals expenditure was assessed as efficient and prudent.

Authority's Analysis

The Authority notes GHD's advice that some items were under costed particularly in regard to flood damage. The Authority has not received any additional information in regard to flood damage from SunWater. The Authority has sought information from SunWater on flood insurance but no information in regard to the full cost of repairs attributable to flood damage and the level of any insurance payout has been received as of this report. In principle, flood insurance payouts to fund replacement of assets should offset future replacement costs.

The Authority also notes GHD's recommendations for the St George WSS to include the repairs to the Jack Taylor Weir balustrades and revise the cost estimate for the restoration of the wing walls and flood damaged rock pitching.

As noted above, the Authority has applied a general 10% cost saving to renewals items reviewed by GHD.

Item 4: Reinstatement of Outlet Works for Jack Taylor Weir

SunWater

SunWater advises that both of the existing outlet valves at the Jack Taylor Weir were installed in 1968 as part of the original construction of the weir. SunWater has proposed expenditure for the reinstatement of the outlet works, replacement of both of the outlet valves, at a projected cost of $282,000 in 2011-12.

Other Stakeholders

No other stakeholders have commented on this item.

GHD's Review

GHD considered that the reinstatement of the outlet works is required to ensure that controlled releases can be made rather than rely on opening the gates. The weir has an outlet pipe and valve in the centre of the weir floor, which was inaccessible for maintenance or operations. The valve and outlet pipe had been sealed several years ago to address safety issues with this design. The new outlet works has been designed to be installed within the left wall of the weir. GHD considered that the need for this project and indicative costs are supported on operational and engineering practice grounds, although the timing could be deferred if needed.

The need to refurbish the outlet gate guides was reviewed by GHD on site and was supported based on their design and condition. GHD reported that there is a risk that if the guides deteriorate further, the gates may seize and become inoperable. If the gates seize shut, the weir's structural integrity could be compromised and releases of water will not be possible.

SKM's Review

(a) Available Information

SKM reviewed SunWater's SAP WMS, and asset condition and risk assessment policy and procedures.

Table 4.8: Documentation Reviewed Specific to the Jack Taylor Weir Reinstatement of Outlet Works

Document No.	*Document Name*	*Document Title*	*Date*
1109920	1109910 – v1 – 17- QCA Justification Jack Taylor Weir – Outlet Works	Reinstatement of outlet works for ROP - $273,511 [2012] (SGA-JTW-SPWY-OWKS)	24 August 2011

Source: SKM (2011).

(b) Prudency Review

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

SunWater's SAP-WMS has listed the asset at object type as a VLSLUI which has a standard run to failure life of 40 years and a standard refurbishment period of 13 years. SKM considered the applied run to failure asset life and refurbishment period for this asset to be appropriate for this asset type and in keeping with good industry practice.

SKM viewed the WMS record for this asset confirmed that the asset has been in service since 1968.

The existing risk evaluation, as recorded in SAP, determined that the asset's Stakeholder Relationship criterion risk is major with a consequence rating (score 40). The consequence rating together with a probability (likelihood of occurrence) score of 10 results in an overall risk score of 400 which places this asset in a Medium risk category. For this asset type, an overall risk category of Medium reduces the run to failure asset life from 40 years to 35 years and the standard refurbishment period from 13 years to 12 years. SKM considered this reduction in run to failure asset life and refurbishment period based on this risk assessment for asset replacement and refurbishment planning purposes to be appropriate and in keeping with good industry practice.

The risk evaluation conducted did not include consequence ratings for workplace health and safety (WHS) and Environment. In this regard, SunWater has not complied with its Procedures and Policies. The SunWater Report referenced above states that should the WHS consequence rating of this valve have been evaluated as part of the risk evaluation it would have increased the overall risk rating for the asset from a Medium to a High risk. However omitting the WHS risk criterion score has no impact on the renewals item. The only effect is that it would move the priority for undertaking the works from a C Priority, condition based, to a B Priority, risk based (safety and environment). Given the above, SKM recommended that this task be listed as a B Priority.

The reduced run to failure life of the valve implies that it was to be replaced in 2002-03, making use of the existing Asset Management Planning Methodology Paper; in this regard SunWater is not complying with their existing Policy and Procedures.

The condition assessment interval is set at five years for this object type (VLSLUI). The latest condition assessment as recorded in WMS for this asset was undertaken in 2006. The maximum score, recorded in SAP-WMS, is a 6 (Asset has failed and is not operable) assigned to External Coating/Surface/Bolts and Valve Internal Condition. The condition assessment also

noted the following WHS issues: very bad access, no screens at front (Public Safety Issue) very hard to operate.

SunWater's Asset Management Planning Methodology Paper states that an asset with an Asset/Business Risk rating of 'Medium' should be replaced or refurbished once the maximum condition score reaches 5. The maximum condition score has exceeded the score of 5 and the asset is therefore, according to SunWater's Policy and Procedures, due for replacement.

(c) Option Evaluation

SunWater commissioned Infrastructure Development (ID) to undertake the design and detailed cost estimation for the replacement of the valve. SKM noted that a like for like replacement was not considered due to the WHS issues identified with the existing configuration. SKM considered that SunWater's decision to commission ID to undertake the study to design and cost a solution to best address the WHS issues is in keeping with good industry practice. The scoping document lists the following four options that were to be considered by ID:

(a) abandon valves and releasing all water through the gates. This option would require that the existing conduits through the wall to be filled up with concrete. Issues that would need to be addressed are whether the ROP conditions would be met, control of releases from the EJ Beardmore Dam and how would this impact the operation of St George Pump Station;

(b) replace existing valves complete with a hydraulic system that is operable from the river bank. Issues that would need to be addressed are whether the ROP conditions would be met, requirement for screens upstream and ensuring the control centre was places at an appropriate level;

(c) abandon existing valves and install a new larger outlet closer to the Town end of the weir. This option would require that the existing conduits through the wall to be filled up with concrete; and

(d) enlarge the existing outlet work with a hydraulic system that is operable from the river bank. Issues that would need to be addressed are whether the ROP conditions would be met, requirement for screens upstream and ensuring the control centre was places at an appropriate level.

From the information provided, SKM understand that the design solution proposed by ID is a combination of options (c) and (d).

SKM reviewed the list of options provided in the project scoping report and considered the options that were to be investigated appropriate. SKM have not viewed the design that ID is proposing. SKM are unable to provide comments regarding the suitability and effectiveness of the proposed design.

(e) Timing of Renewal/Refurbishment

Based on the 2006 condition assessment and in accordance to SunWater's Policy and Procedures, the valve has been due for replacement since 2002-03. The condition assessment that was conducted in 2006 confirmed that the valve has deteriorated past a score of 5 (major deterioration such that asset is virtually inoperable). SunWater is exposed to explicit risk by not replacing the valves. SKM therefore considered the timing of this replacement to be prudent.

(f) Conclusion on Prudency Evaluation

SunWater identified that the existing valve arrangement has a WHS risk and therefore commissioned ID to design and cost an alternative arrangement. SKM recommended that this task of replacement be listed as a B Priority based on risk (Safety and Environment) as opposed to the current C Priority allocated. On the understanding that SunWater's policies for adjusting refurbishment periods and assessing asset condition have been followed, SKM concluded that the need for replacement of this renewals item has been demonstrated.

(g) Efficiency Evaluation

SunWater has commissioned ID to undertake the design and costing of the replacement of this renewals item. This replacement did not consider a like for like replacement as this would not meet WHS requirements. A unique design is required to address the WHS issue and SKM considered this approach reasonable and in accordance with good industry practice.

(h) Renewal/Replacement Project Cost Evaluation

The detailed costing was undertaken by ID as part of their scope. The information contained in the SunWater Report referenced above contains the following costing information presented in Table 4.9.

Table 4.9: Summary of SunWater's Cost Estimate

Number	*Description*	*Total Cost ($)*
1	Contractors	26,000
2	Internal Labour	29,970
3	Internal Overhead	40,069
4	Materials	113,000
5	Plant Equipment and Vehicles	42,000
6	Service Charges	22,472
7	**Total**	**273,511**

Source: SKM (2011)

From the above cost estimate SKM concluded that both of the valves are included for replacement. SunWater has not made the design drawings available for SKM to view. Based on the limited information available, SKM have prepared a cost estimate based on installing a trash screen within a new concrete structure, installing two new 450 mm diameter outlet pipes complete with a gate valve equipped with electric actuators and proving control equipment. SKM's cost estimate is shown in Table 4.10.

Table 4.10: SKM Cost Estimate

Number		*Description*	*Total Cost ($)*
1		Contractors and Material	
	1.1	DN450 Gate Valve (USDM22) x 2	23,712
	1.2	Install DN450 Gate Valve (USMD51)	1,852
	1.3	Rotork Actuators x 2 (11A) – (ACT004)	10,790
	1.4	Control Equipment (USMS98 S&I Actuator and Control Equipment –ACT004 Rotork Actuator 11A)	32,546
	1.5	New 2 x DN450 conduits through weir wall (Allowed $23400 for coring through the wall and $5586 for the new MSCL pipe)	28,986
	1.6	New Screen Structure (5m x 2.8m PS7C Trash screen with PS3C Concrete Intake Walls and PS3B Concrete Intake Base)	16,234
	1.7	Temporary Works – Coffer Dam, pumping excess water	20,000
		SUB-Total A	**134,120**
2		Preliminary and General Items (17% of Sub-Total A) Includes traffic management, environmental plans and Contractor's overheads	22,800
		SUB-Total B	**156,920**
3		SunWater Overheads and Labour Component (45% of Sub-Total B)	70,614
		TOTAL	**227,534**

Source: SKM (2011)

The cost estimate prepared by SunWater is within SKM's level 4 estimating range of +30%/-20% for SKM's cost estimate and SKM therefore considered the renewals expenditure submitted efficient.

(i) Conclusion on Efficiency Evaluation

SKM considered the value submitted for this renewals item is efficient, based on the information to SKM's disposal.

(j) Summary and Conclusions

SKM was satisfied that SunWater's robust procedures for determining the timing of replacement of a renewals item have largely been followed. Hence, SKM concluded that the timing and need for replacement of this renewals item is prudent.

The renewals expenditure that SunWater supplied to the Authority is substantiated and deemed efficient, based on the limited information to SKM's disposal.

The Authority notes that the total cost (including direct and indirect) submitted by SunWater for this renewals item ($282,000) does not equate to the amount reviewed by SKM ($273,511). 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.

Authority's Analysis

On the basis of its consultants' findings, the Authority accepts that this renewals item is prudent and efficient.

Item 5: Moolabah Weir Renewals Projects 2011-12 to 2015-16

SunWater

SunWater proposed the following renewal projects for the Moolabah Weir (Table 4.11) in real terms as at 2010-11.

Table 4.11: Moolabah Weir Renewals Expenditure 2011-12 to 2015-16 (Real $'000)

Project	*Driver*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*
12SGAXX - Repairs to Crest and back face	Condition	250	-	-	-	-

Note: Costs include indirect and overhead costs. Source: GHD (2011)

Other Stakeholders

No other stakeholders have commented on this item.

GHD's Review

GHD reviewed the projects listed in Table 4.11 in SunWater's SAP-PM and WMS. GHD considered that the drivers for each project were sound, and the timing and cost of the works appear to be prudent.

The Moolabah Weir was inspected by the GHD engineers during the site visit. The weir had suffered significant damage through the loss of material under the embankment concrete slabs. The damage needed to be repaired to protect the structure from further damage. While the cost of the repairs will be dependent on the selected repair method, GHD considered that the cost estimate appeared to be appropriate.

GHD visited the Moolabah Weir on 2 March 2011 and observed the following:

(a) the downstream concrete apron is buttressed against a shear key and rock mattress erosion protection is provided downstream of the apron. The rock mattress is in good condition. According to the operators, the downstream concrete slabs are underlain by sand;

(b) rainfall runoff as well as flow over the crest has resulted in removal of some of the underlying sand leading differential movement at the crest of up to 150 mm. The movement has also led to structural cracking in the middle of some slabs. Furthermore, the inflow of rainfall runoff as well as the flood overtopping has resulted in pressurisation below the downstream concrete apron leading to uplift of a number of slabs against the downstream shear key. The joint opening at the crest resulting from the differential movement has been filled with mastic filler in the past but the movement has continued since the sealing. This movement has been occurring since completion of the weir, and a full repair to the crest and back face is required. Various solutions are available to treat the voids under the slabs. Cement grouting was recommended to fill the voids below the backface slabs and resealing of the joint between slabs and the crest is required. The

uplift of the downstream slabs may require removal of these slabs and reinstatement if it is found that they are structurally unstable as a result of the movement that has occurred to date;

(c) the upstream face of the weir is protected against wave erosion using rip rap, which appears to be adequate. Normal preventive maintenance requirements include, removal of grass from the rip rap, cutting of grass, as well as the replacement of the mastic sealant;

(d) the weir is currently used for diversion of flow into the right bank canal as well as forming the headwater pond for the irrigators on the abutments. Failure of the weir with continued slab movement due to rainfall and then overtopping by flood waters is a distinct possibility. Therefore, the effect of weir failure should be evaluated to determine whether the corrective maintenance is required; and

(e) the canal intake structure on the right abutment is in good condition and the trash-racks have recently been replaced. The intake control gates are manually operated using a hydraulic system. The gates were not inspected but the system is fully functional and appears to be working well. The planned replacement of the gates is apparently due the age of the gates rather than operational problems. The use of the upstream concrete stop logs for gate maintenance has been stopped for some time due to the inability to provide a complete seal. Maintenance of the gates or the concrete structure is readily carried out now, following the construction of an earth fill bund across the intake to the canal, followed by closure of the canal. This method of closure has been used effectively in the past and there is no reason for change.

GHD generally concluded that the forecast renewals expenditure was assessed as efficient and prudent.

Authority's Analysis

As noted above, the Authority has applied a general 10% cost saving to renewals items reviewed by GHD.

Item 6: St George WSS Renewals Projects from 2015-16

SunWater

SunWater proposed a range of renewals project beyond 2015-16 (Table 4.12).

Table 4.12: St George WSS Renewals Expenditure Beyond 2015-16 (Real $'000)

Facility	*Description*	*Driver*	*Year*	*Value*
EJ Beardmore Dam	Refurbish: Part replacement of components due to obsolescence. 4 Small boards and one Main Board	Age	2021-22	49
EJ Beardmore Dam	Refurbish Hoisting Mechanism - Beardmore Dam Gate 7, 8 9, 10, 11 & 12	Age	2021-22	120
EJ Beardmore Dam	Refurbish: regrade embankment to design profile	Age	2021-22	73
EJ Beardmore Dam	Replace Trash Screen	Age	2022-23	98
EJ Beardmore Dam	Replace Winch, Perrin Eng	Age	2026-27	2094
EJ Beardmore Dam	Replace Winch, Perrin Eng	Age	2027-28	2146
EJ Beardmore Dam	Refurbish: Downstream face Full blast and paint	Age	2027-28	75
EJ Beardmore Dam	Refurbish: Part replacement of components due to obselecence.4 Small boards and one Main Board	Age	2028-29	58
EJ Beardmore Dam	Replace Winch, Perrin Eng	Age	2028-29	2209
EJ Beardmore Dam	Replace Winch, Perrin Eng	Age	2029-30	2247
EJ Beardmore Dam	Clean out foundation drains located in dam gallery	Age	2029-30	94
EJ Beardmore Dam	14SGAXX REFURB:U/S FACE-CP MAINT & PAINT	Age	2029-30	90
Jack Taylor Weir	Replace Winches	Age	2021-22	1241
Jack Taylor Weir	Replace Winches	Age	2022-23	2828
Jack Taylor Weir	12SGAXX BLST & PAINT GATE GUIDES/INST CP	Age	2027-28	172
Jack Taylor Weir	Replace Gate Valve	Age	2028-29	74
Jack Taylor Weir	Replace Starter, 0-30Kw Auto (3 Off)	Age	2029-30	126
Jack Taylor Weir	Replace Control Equipment	Age	2029-30	203

Note: Costs include indirect and overhead costs. Source: GHD (2011)

Other Stakeholders

No other stakeholders have commented on these items.

GHD's Review

GHD reported that the peaks in expenditure result from the planned replacement of the gate winches at the end of their useful life and recurrent repainting programs on the gates and bulkheads.

The renewals projects presented in Table 4.12 were reviewed in SAP-PM to determine whether the expenditures were required and whether the timing was appropriate. All of the projects were forecast on either the planned maintenance frequency of the activities (refurbishment and

repairs) or the useful life of the assets. The schedule dates were checked against the past maintenance or replacement dates and the standard frequencies for assets and activities. The estimates costs were stored in SAP-PM and were based on replacement valves or estimate costs.

A detailed cost estimate or options analysis had not been completed on any of these projects. GHD's audit team members verified the cost estimates by engineering judgement based on very limited cost estimating information. While GHD have not been able to verify the costs by detailed analysis, the order of magnitude estimate are within SunWater's forecast values.

GHD concluded that the forecast renewals expenditure was assessed as efficient and prudent.

Authority's Analysis

As noted above, the Authority has applied a general 10% cost saving to renewals items reviewed by GHD.

Conclusion

In summary, various projects for the St George WSS were sampled. Of these:

(a) the Authority has applied a general 10% saving to renewals expenditure items for 2011-12 to 2015-16;

(b) SKM was able to conduct a detailed review of reinstatement of outlet works for Jack Taylor Weir, which was found to be prudent and efficient; and

(c) the Authority has applied a general 10% saving to renewals expenditure after 2015-16.

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

Therefore, the Authority recommends that forecast renewals expenditure should be adjusted as shown in Table 4.13.

Table 4.13: Review of Forecast (Direct) Renewals Expenditure 2012-36 (Real $'000)

Item	*Year*	*SunWater*	*Authority's Findings*	*Recommended*
Sampled Projects				
1. EJ Beardmore Dam Renewals Projects 2012-16	various	882		10% saving applied
2. EJ Beardmore Dam WTP Renewals Projects	various	101	Insufficient information	10% saving applied
3. Jack Taylor Renewals Projects 2012-16	various	721		10% saving applied*
4. Reinstatement of Outlet Works for Jack Taylor Weir	2011-12	282	Prudent and efficient	282
5. Moolabah Weir Renewals Projects 2012-16.	2011-12	250		10% saving applied
6. St George WSS Renewals Projects from 2016	various	13,997		10% saving applied
Non Sampled Projects				10% saving applied

*Note: * Except for the reinstatement of outlet works for Jack Taylor Weir in 2012, which has not been adjusted as per Item 4. Costs include indirect and overhead costs. Source: SunWater (2011), GHD (2011), SKM (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

Cooinda Cotton Co. (2010) considered that local customers and stakeholders are no longer allowed to view or make comment on required projects to SunWater, yet it appears they are demanding local customers and stakeholders pay all the costs, whether they are delivered on budget or not.

Cooinda Cotton Co. further considered that SunWater no longer publicly releases any financial results detailing where irrigators money is being spent within this scheme. They submitted that there are no publicly available service targets, performance targets, efficiency targets or budgetary targets.

The participants at the Round 2 consultation expressed concern that there has been no consultation with the scheme advisory committee regarding the renewals program and future program plans and that irrigators have not been consulted regarding proposed renewals expenditure.

St George Irrigators (2011) submitted that efficient prices could be achieved through SunWater adopting a strong customer focus evidenced by high service standards, good working relations and effective and meaningful communication. St George Irrigators further considered that consultations since publication of the NSPs have failed to bring forth supplementary information. Additional project information that the Authority has selected for more detailed review is identified and addressed above.

Authority's Analysis

In Volume 1, the Authority noted that customers and their representative groups had concerns about the lack of involvement in the planning of future renewals expenditure.

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 St George bulk water infrastructure were apportioned between priority groups using converted nominal water allocations. The conversion to medium priority WAEs was determined by the Condamine and Balonne ROP conversion factor (1.9:1); that is, one ML of high priority WAE was considered equivalent to 1.9 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).

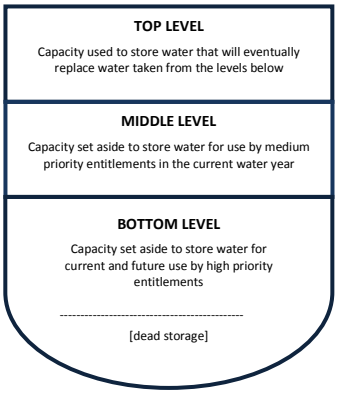
SunWater submitted that, in general, the HUF allocates a greater proportion of capital costs per ML to high priority WAE. Specifically, the HUF methodology takes into account water sharing rules, critical water sharing arrangements and other operational requirements that typically give high priority 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[1].

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

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



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

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

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

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

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 St George WSS are summarised in Table 4.14. They reflect revisions to nominal WAE volumes, as submitted by SunWater in Addendum Part 1 – Erratum: Errors found in HUF Input Data (SunWater, 2011x). As the St George WSS scheme operates under continuous water sharing arrangements, Steps 3 and 4 of the HUF methodology outlined above do not apply. Instead, the continuous water sharing rules from the Condamine and Balonne ROP are used to determine the HUF.

The HUFs for this scheme are 94% for medium priority and 6% for high priority.

[1] 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.

Table 4.14: Application of HUFs Methodology

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

Nominal Group	(ML)	HUF Group	(ML)
Medium Priority	81,575	MP_A	81,575
High Priority	3,000	HP_A	3,000

STEP 2: ROP Conversion Factor Adjustment

Conversion Factor: ROP_{CF}	N/A
Maximum volume that can be converted to HP: $HP_A max$	3,000
Corresponding volume of MP: $MP_A min = MP_A-(HP_A max-HP_A)*ROP_{CF}$	81,575

STEP 3: Water Sharing Rules & Operational Requirements

The scheme operates under Continuous Sharing water sharing rules.

Refer to the Condamine Balonne ROP (Table 15.2) for details of continuous sharing parameters.

STEP 4: Hydrologic performance of headworks storage

Utilised Capacity (ML)
$MP_u = MP_{1u} + MP_{2u} = 88,170$
$HP_u = HP_{1u} + HP_{2u} = 5,490$

STEP 5: Calculation of HUFs for each Water Entitlement Group

Formula	HUF Group	Nominal Group
MP_A: $MP_u / (MP_u + HP_u) =$ 88,170 / (88,170+5,490)	$HUF_{mp} = 94\%$	Medium Priority = 94%
HP_A: $HP_u / (MP_u + HP_u) =$ 5,490 / (88,170+5,490)	$HUF_{hp} = 6\%$	High Priority = 6%

Source: SunWater (2010d, 2011x).

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.

As discussed in Volume 1, the Authority endorsed SunWater's proposed approach for the allocation of capital costs, subject to the incorporation of the following from 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 (2011x) accepted these recommendations and submitted recalculated HUFs for each scheme. However, since the St George WSS operates under continuous water sharing

arrangements, the recommendations made by G&S do not affect the HUF values for this scheme.

The Authority estimates that based on the HUF methodology, the conversion for medium priority to high priority would be 1.74. This compares with the WPCF of 1.9 used for 2006-11 price paths. Further, the Authority notes that under the HUF approach, medium priority irrigators will now pay 94% of the cost of renewals whereas previously medium priority irrigators paid 93%.

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 St George WSS the recommended renewals annuity for the 2012-17 regulatory period in real terms as at 2010-11 is shown in Table 4.15. The table shows the total renewals annuity recommended by the Authority and the component amounts for high and medium priority customers. Also presented for comparison is SunWater's total renewals annuity for 2006-11 and SunWater's proposed total annuity for 2012-17. SunWater did not submit a disaggregation between high and medium priority customers.

Table 4.15: St George WSS Renewals Annuity* (Real $000)

	Actual						*Recommended*				
	2006-07	*2007-08*	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*	*2016-17*
Total SunWater	64	256	280	259	256	760	750	745	738	732	732
Total Authority	-	-	-	-	-	-	653	646	636	630	621
High Priority	-	-	-	-	-	-	0	0	0	0	0
Medium Priority	-	-	-	-	-	-	579	573	564	558	551
Distribution Losses	-	-	-	-	-	-	74	73	72	71	70

** 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 this scheme;

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

(c) the 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 allocating operating costs to service contracts[2] and to different priority customer groups (within each service contract).

5.2 Total Operating Costs

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

Non-direct costs are classified as either:

(a) overhead costs – allocated to all of SunWater's 62 service contracts for services that support the whole business (for example, Board, CEO and human resource management costs); and

(b) indirect costs – allocated to more than one service contract (but not all service contracts) for specialised services pertaining to a particular type of asset or group of service contracts (for example, asset management strategy and systems).

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

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

(a) a Service Manager and 10 staff are located at the St George depot and are responsible for the day-to-day water supply management and delivery of the programmed works for all users in the region;

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

(b) service provision relates to:

(i) water delivery – scheduling and releasing bulk water from storages, surveillance of water levels and flows in the river, and quarterly meter reading; and

(ii) customer service and account management – managing enquiries about accounts and major transactions; providing up to date online data on WAE, water balances and water usage; and managing transactions such as temporary trades, transfers and other scheme specific transactions;

(c) compliance requirements to provide the bulk service include those relating to:

(i) the ROP and Resource Operations Licence (ROL) – a major part of which is gathering and reporting data at quarterly and annual intervals on water sharing rules, ROP amendments and modifications; water accounting and reporting on stream flow, water quality and other data (see Table 5.1 below);

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

Storage	***Monthly monitoring requirements***			
	Storage Level	***Head Water***	***Tail Water***	***BGA***
EJ Beardmore Dam	No	Yes	Yes	Yes
Jack Taylor Weir	No	Yes	Yes	Yes

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

(ii) dam safety – EJ Beardmore Dam is classified as a referable dam under the *Water Act 2000*. SunWater is required to have a comprehensive safety management program in place comprising policies, procedures and investigations to minimise the risk of dam failure.

Routine dam safety inspections are carried out monthly on EJ Beardmore Dam and Jack Taylor Weir and quarterly on Moolabah and Buckinbah Weirs. Specific dam safety inspections are required at the dam, which include monitoring of embankments, 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. Audits and more thorough inspections are carried out annually and even more thorough compliance inspections and audits are carried out five yearly.

(iii) environmental management to comply with the ROP and *Environmental Protection Act 1994* which require SunWater to deal with risks such as fish deaths, chemical usage, pollution, contaminants and approvals for instream works; 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 workplace health and safety, financial reporting and taxation and irrigation pricing;

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

(e) SunWater has sought to transfer the management and cost of recreation activities to private operators or Government. However, recreation facilities at EJ Beardmore Dam continue to be operated and maintained by SunWater (the cost of which is outlined further below); and

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

Previous Review

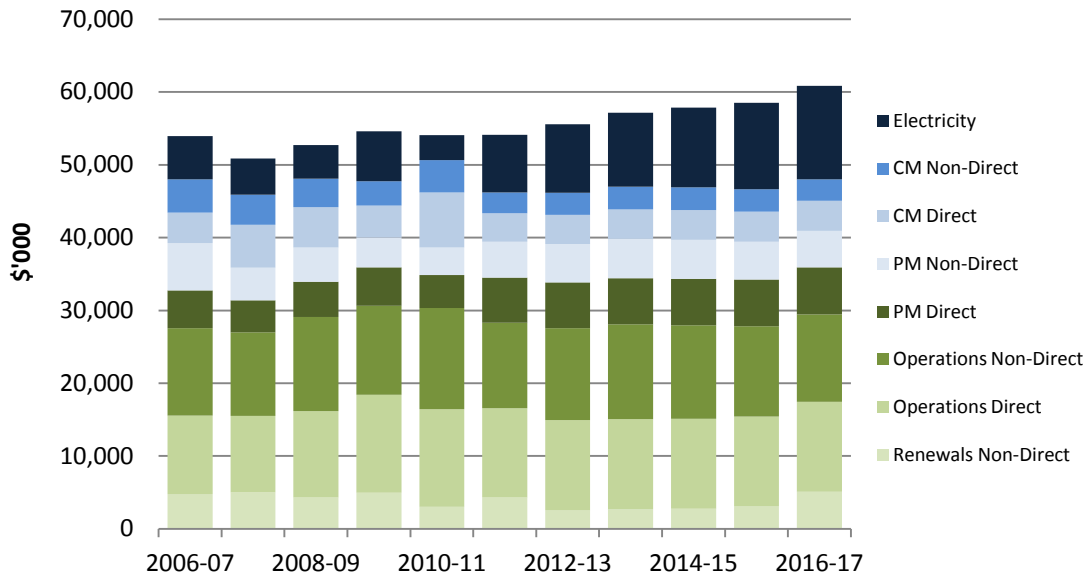
For the 2006-11 price paths, Indec identified annual cost savings of between $3.8 million and $5.5 million (2010-11 dollars) or 7.5% to 9.9% of total annual costs, which SunWater was to achieve during the 2006-11 price paths (SunWater, 2006a). See Volume 1.

Stakeholder Submissions

SunWater

SunWater's past and forecast total operating costs for its irrigation service contracts are summarised in Figure 5.1 below. SunWater's allocation of non-direct costs to activities (including renewals) is also identified. These estimates reflect SunWater's most recent positions, including information receievd in October 2011, and differ from their NSP as noted in Volume 1.

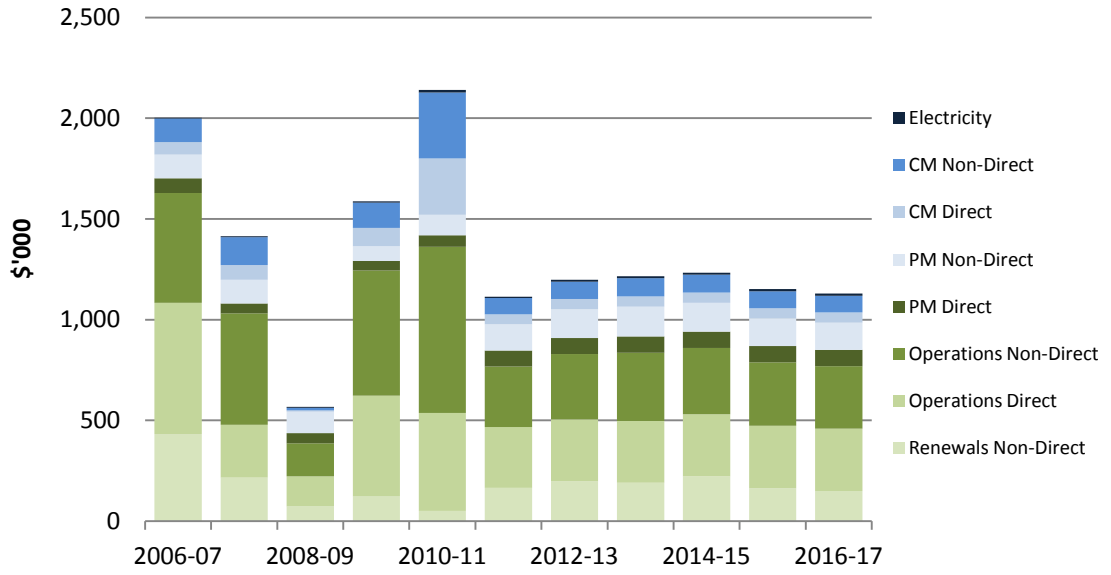
Figure 5.1: SunWater's Total Operating Costs (Real $'000)



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)

Expenditure by activity in St George WSS (all sectors) is shown in Figure 5.2 and Tables 5.2 and 5.3.

Figure 5.2: Total Operating Costs – St George WSS (Real $'000)



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

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

	2006-07	*2007-08*	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*	*2016-17*
Operations	1,197	815	312	1,121	1,310	603	631	646	638	625	619
Electricity	4	4	4	6	13	7	9	9	10	11	12
Preventive maintenance	191	168	157	120	159	210	222	229	225	218	216
Corrective maintenance	180	211	20	216	606	130	137	141	139	135	133
Renewals non-direct	432	216	74	123	52	165	199	190	222	163	149
Total operating costs	**2,003**	**1,414**	**567**	**1,587**	**2,140**	**1,115**	**1,198**	**1,215**	**1,233**	**1,152**	**1,130**

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	324	288	117	430	565	262	266	266	266	266	266
Electricity	4	4	4	6	13	7	9	9	10	11	12
Contractors	14	11	9	89	112	21	22	22	22	23	23
Materials	390	33	12	35	91	83	85	86	87	88	88
Other	58	53	67	83	53	65	65	65	65	65	65
Non-direct	1,212	1,025	357	943	1,307	675	752	767	783	700	677
Total Operating Costs	**2,003**	**1,414**	**567**	**1,587**	**2,140**	**1,115**	**1,198**	**1,215**	**1,233**	**1,152**	**1,130**

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)

In its NSP, SunWater submitted that the operating costs for this scheme averaged $1.102 million per year over the period of the current price path. [Operating costs as defined in the NSP exclude the indirect and overhead costs allocated to renewals expenditure.] The projected efficient average operating costs in the NSP for 2011-16 are $977,000 per annum.

Other Stakeholders

St George Irrigators (2011) submitted that the NSPs issued by SunWater are very light on detail and do not reveal how particular cost items were arrived at. Participants at the Round 2 consultation also considered that the NSPs do not provide adequate information to allow analysis of efficiencies.

St George Irrigators (2011) assumed that the crude cost projections shown in the NSPs are masking the possibility of inflated and inefficient water prices.

Cooinda Cotton Co. (2011) submitted that they have serious concerns about the quality of the financial data SunWater has released to the Authority. Cooinda Cotton Co. submitted that total expenditure is put up through the NSPs with very little detail to support any of the numbers provided. Further, they fail to comprehend how financial data that could be easily explained and interpreted in the past two price paths of 2000-01 and 2005-06 is now either 'lost' or not available from the SunWater financial control system.

Cooinda Cotton Co. considered that if SunWater cannot produce an accurate report on its costs on each scheme, its financial management is questionable.

Participants at the Round 2 consultation considered that forecasts of operational expenditure are similar to a budget and SunWater needs to operate within this budget. They suggest that this has clearly not happened.

The Authority's Analysis

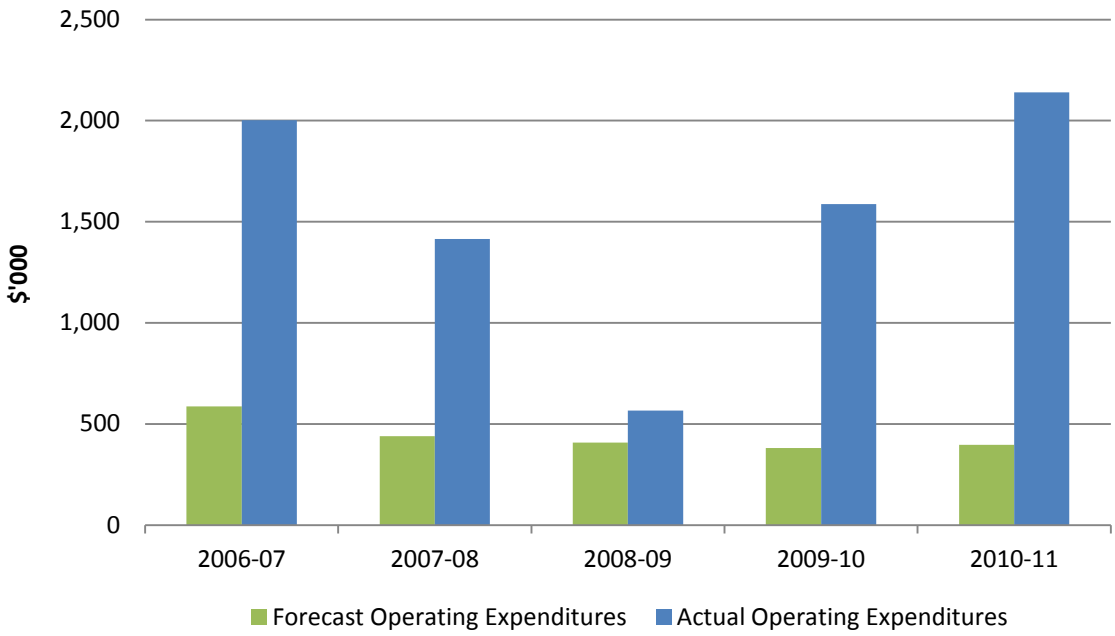
The Authority has sought to review the extent to which previously anticipated cost savings (identified prior to the 2006-11 price paths) have been incorporated into SunWater's total cost estimates for the purpose of 2012-17 prices.

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 St George WSS is shown in Figure 5.3 below.

For this scheme, SunWater's actual operating costs were more than Indec's forecast of efficient operating costs over the period. Indec noted that anomalies could arise for the service contracts from linked bulk and distribution systems and the solution was to combine them into bundled schemes. See Volume 1.

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



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

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

In response to stakeholder comments that SunWater's costs have exceeded budgetary forecasts, the Authority notes that cost over-runs during 2006-11 occurred mainly in operations costs, and that forecast operations costs for 2012-17 are substantially lower than recent levels. The Authority's analysis of efficient operations costs is provided below.

The Authority notes stakeholder comments concerning the NSPs not providing adequate information to allow analysis of efficiencies. The Authority has sought further information from SunWater in order to analyse the efficiency of operational expenditure. This analysis is presented 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 is detailed in Volume 1.

As noted above, SunWater categorises non-direct costs as either overheads or indirect costs.

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 total direct labour costs (DLCs) be used to allocate non-direct costs between service contracts.

Total non-direct costs and those allocated to the St George WSS are set out in Table 5.4 below.

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

	2006-07	*2007-08*	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*	*2016-17*
SunWater	27,831	25,097	25,872	24,579	25,152	23,770	23,512	24,244	24,055	23,708	25,089
St George WSS	1,212	1,025	357	943	1,307	675	752	767	783	700	677

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 costs of SunWater's Infrastructure Development Unit.

Other Stakeholders

Participants at the Round 2 consultation considered that overheads amounting to nearly 60% of costs are considered excessive. They queried as to how these costs were justified and how the Authority will adequately assess efficient overhead costs for SunWater which is a monopoly. They further queried on what basis does SunWater review staff structures in head and regional offices to assess need/performance or is staffing maintained at an assumed level and costed out each year.

Participants at the Round 2 consultation queried as to where the incentive is for SunWater to introduce efficiencies in head and regional offices other than by using increasing centralisation but declining servicing to deliver reductions in costs.

St George Irrigators (2011) submitted that the cost recovery processes for the new price path are focused not so much on the cost of activities that have to be recovered but more on the accuracy of cost allocation among users. St George Irrigators submitted that SunWater's total centralised costs have no doubt increased as SunWater has become more involved in 'outside' construction, consulting and contracting. They expressed concern about:

(a) the quantum and compilation of centralised costs;

(b) the practice of allocating centralised costs according to arbitrary rules; and

(c) the difficulties of quarantining costs that don't properly belong to any WSS.

St George Irrigators (2011) submitted that centralisation in the state capital could be perceived as having the following weaknesses:

(a) an excessive drag on the budget due to the tendency for the senior staff of GMOs to benchmark their pay and conditions against standards applying in the CBD. They considered that when the same water delivery services were provided by a government department, the pay and conditions of senior staff were subject to comparatively more control and transparency; and

(b) excessive transfer of wealth from the bush to the city.

St George Irrigators (2011) submitted that according to SAHA's report, SunWater is harbouring substantial scope to cut costs going forward, including labour and salary saving and much of this might materialise in SunWater's central and regional offices.

Cooinda Cotton Co, (2011) submitted that the analysis conducted by State Water Projects' (the predecessor to SunWater) consultants Ernst & Young and GHD in 2001 determined that the efficient Head Office Charges attributed to the St George Scheme be $399,367 per annum. This figure was to be achieved following a 20% improvement in efficiency between the 2000-01 and 2005-06 price paths. The 2011 Deloitte Touche Tohmatsu (Deloitte) study commissioned by the Authority, found head office charges attributed to this scheme is now a staggering $1,588,000 per annum. This massive increase cannot be justified. St George irrigators must not be held financially responsible for such massive blowouts in costs, or of SunWater inability to manage its budget.

The Authority's Analysis

The Authority notes stakeholder concerns in regard to the level of non-direct costs attributed to the St George WSS. 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 to review SunWater's non-direct costs. Deloitte carried out benchmarking to assess where potential efficiencies within SunWater may be achieved. Deloitte identified savings of $495,314 (in 2010-11 real terms) per annum in finance, human resources, information technology, and health, safety, environmental and quality areas (for the whole of SunWater).

Deloitte was unable to draw any definitive conclusions from an attempt to benchmark against Pioneer Valley Water Board (PVWater) and other Australian rural water service providers. Deloitte noted that PVWater's non-direct costs were higher than those of SunWater as a percentage of total operating costs – but that there are differences between PVWater and SunWater which made the comparisons unreliable.[3]

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 $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:

[3] For example, PVWater have only four FTE staff. For the benchmarking exercise, PVWater needed to estimate the proportions of staff time spend on administration versus operations and maintenance activities, which varies 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.

(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 unity (that is, targeted DLC).

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

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

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

	2006-07	*2007-08*	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*	*2016-17*
SunWater	1,212	1,025	357	943	1,307	675	752	767	783	700	677
Authority							724	731	737	651	620

Source: SunWater (2011ap), QCA(2011)

In response to Cooinda Cotton Co., the Authority notes that $399,367 assigned to State Water Projects' corporate office costs in 2000-01 cannot be directly compared with the non-direct costs for this price path. Firstly, corporate office costs are only a component of non-direct costs. Even in the 2001 review, additional costs of a non-direct nature were identified, including water business management (of $340,614). Secondly, operating activities by SunWater, and in particular compliance requirements, have changed significantly since 2000-01 (for example the ROP was introduced in 2008). Thirdly, the 2001 estimates are in 2001-02 dollar terms and SunWater estimates are in 2010-11 dollar terms. Finally, scheme prices were bundled in 2000-01 and have been disaggregated for this review. The $1,588,000 estimate of SunWater's proposed non-direct costs by Deloitte relates to the (bundled) St George WSS and Distribution System. This estimate differs from SunWater's proposed $1.3 million in Table 5.5 (for the St George WSS only in 2010-11).

The Authority notes that SunWater has proposed a reduction of about 20% in non-direct costs in 2012-13 as compared to the average of the last six years. The Authority has further reduced costs as noted above.

Insurance and labour utilisation rates (which affect non-direct and direct 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 below. These estimates reflect SunWater's most recent positions and differ from the NSP.

Table 5.6: 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	652	262	148	499	486	303	306	307	309	310	310
Electricity	4	4	4	6	13	7	9	9	10	11	12
Preventive maintenance	73	49	50	47	56	79	80	81	81	81	81
Corrective maintenance	62	73	7	91	279	50	50	50	51	51	51
SunWater Direct Operating costs	**790**	**389**	**209**	**644**	**833**	**439**	**445**	**448**	**451**	**452**	**453**

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

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

Table 5.7: 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	324	288	117	430	565	262	266	266	266	266	266
Electricity	4	4	4	6	13	7	9	9	10	11	12
Contractors	14	11	9	89	112	21	22	22	22	23	23
Materials	390	33	12	35	91	83	85	86	87	88	88
Other	58	53	67	83	53	65	65	65	65	65	65
SunWater Direct Operating Costs	**790**	**389**	**209**	**644**	**833**	**439**	**445**	**448**	**451**	**452**	**453**

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

GHD noted that there were substantial information deficiencies relating to the information provided by SunWater. GHD reported that sampling was not possible due to the level of aggregation in SunWater's SAP-WMS. GHD also reported that, where possible, information was gathered via direct interviews and information sessions with analysis undertaken of the information made available. Comparisons against published benchmarks were made, where possible.

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.

GHD'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

Operations relate to the day-to-day operational activity (other than maintenance) enabling water delivery, customer management, asset management planning, financial and ROP reporting, WHS compliance, and environmental and land management.

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

SunWater's proposed operations costs are set out in Table 5.6 above. SunWater noted that recreation facilities at Beardmore Dam continue to be operated and maintained by SunWater.

Table 5.8: Recreational Facility Costs (Real $'000)

	2011-12	*2012-13*	*2013-14*	*2014-15*	*2015-16*
Recreational Facility Cost	92	92	118	80	126

Source: SunWater (2011)

Other Stakeholders

Participants at the Round 1 consultation considered that operational expenditure incurred by SunWater is of concern with significant increases over the last two years. They further considered that although SunWater now employs less staff and provides lower service standards in the region, higher costs are applied to irrigators due to the five-year price path.

St George Irrigators also submitted that they are disappointed that more attention has not been given to ways and means of increasing SunWater's operational efficiency for the purpose of actually reducing water delivery charges.

Cooinda Cotton (2010) submitted that the St George irrigation scheme is largely gravity fed and thus has low operating costs

During Round 2 consultation, irrigators submitted that costs associated with administering continuous sharing arrangements have been $400,000 over the 2007-2011 price path. Irrigators consider that SunWater, in promoting continuous sharing arrangements, did not previously identify these costs and, as a consequence, the rationale for these costs needs to be provided.

Irrigators consider that the costs associated with administering continuous sharing arrangements are not identified adequately in the NSP. Round 2 participants consider an equitable allocation of continuous sharing costs could be through apportioning them to other schemes through including them as head-office or regional office costs.

St George Irrigators (2011) submitted that for the purposes of upholding the user-pays philosophy, SunWater should invoice the appropriate government department for all the costs associated with constructing and maintaining recreational facilities at their various water storages. Imposing 'recreation costs' on irrigators violates the spirit of user-pays and is a blatant abuse of monopoly power in government hands; in a competitive market it would not be possible to arbitrarily pass-off charges (created by some third party) to the primary customer.

St George Irrigators (2011) submitted that extracting a charge from direct users would be difficult but there are other entities more responsible and more able (to pay) than local irrigators. Expecting local irrigators to pay for tourist facilities at storages is demonstrably unjust and dishonours the user-pays principles.

St George Irrigators (2011) further submitted that bridges that service the St George WSS but remain accessible to the public should not be the exclusive responsibility of irrigators.

Cooinda Cotton Co. (2010) submitted that irrigators have no input into the operation and maintenance of the scheme, there are no irrigators on the SunWater board or at any other level of management, the local advisory committees rarely meet and it is SunWater's role to run these committees.

Authority's Analysis

GHD's Review

GHD stated that the release of water is a labour-intensive activity as was demonstrated during GHD's site investigations. GHD also stated that the SunWater personnel carry out required servicing at each site to maintain water flows every day. Most water release sites are remote and have no access to electricity. The water release structures are substantial and require a powered mechanical means to open valves.

GHD acknowledged that some stakeholders may argue that the use of other means to achieve water releases should be considered. However, GHD considered this would prove to be cost prohibitive due to the considerable cost of capital that would be required to connect some of the release sites to electricity as an example. GHD further considered that even if the cost is discounted, automation of water releases could not guarantee effective and accurate releases occur due to the build-up of weed and other contaminates around the release mechanisms. GHD advises that these mechanisms require frequent cleaning to maintain efficient water flow.

GHD stated that in discussions during the stakeholder meeting, stakeholders were of the opinion that they could manage the weeds more cost effectively. SunWater pointed out that this practice was not conducive to erosion management as SunWater is responsible for erosion management and this was the reason for the weed management methods employed.

GHD advised that at one site inspection a hydraulic system is used to actuate the valves. GHD considered that the process of connection of the hydraulics, changing the value position and disconnecting the system again is labour intensive. At other sites the valves are adjusted manually (that is, unpowered) with some sites having powered actuators. GHD advised that powered or unpowered, the valve positioning process is manual requiring the operator to count the number of turns or measure the time a valve is driven to its required position.

GHD considered that it is problematic to use the averages as an evaluation point due to the extenuating circumstances of recent flood events, extended drought period requiring additional pumping of water and other extraneous events both inside and outside of the control of SunWater. GHD advised engineering and operations management judgement was exercised to evaluate the cost allocations for this scheme.

GHD further advised that as the scheme is a continuous share scheme, daily variation of flows and releases are required to fulfil customer orders. SunWater staff also carry out daily maintenance activity at each site (such as clearing trash screens) to make the best use of the time taken to travel to each site. These activities are also aimed at mitigating the risks that sufficient water is not released to meet the customer order.

GHD stated that meter reading is conducted on a monthly basis and is argued by SunWater to be a necessary requirement to comply with the ROP. GHD suggests that having the customer read the meter and enter the reading via the SunWater Online system would be a substantial efficiency gain.

GHD considered that SunWater's counter argument that the customer may not enter the correct reading is not valid on the basis that the customer requires an accurate reading to manage their allocation. GHD further considered that it is in customers' best interest to have the most accurate meter reading to allow them to plan their consumption and potential for water trading.

GHD stated that SunWater would still be required to conduct the quarterly meter read for the purposes of billing and to assess the condition of the meter and its' ancillary devices (solar panel, etc.). The quarterly read would also serve to validate the monthly readings entered by the customer. It could be argued that the customer would gain a benefit from entering the meter reading on a daily basis during periods of peak consumption. GHD considered that the time gained from not having to conduct monthly meter readings could be utilised to complete preventive maintenance activity on either the WSS or Distribution Scheme.

GHD recommended that SunWater negotiate with the customers to have monthly meter reading entered via the SunWater Online Customer account and reduce their own meter reading routine to quarterly.

SunWater's Response

SunWater did not support GHD's recommendation that customers read their own meters on a monthly basis. SunWater stated in its response that:

(a) given continuous sharing is partially based on a series of operational assumptions (including estimates of river transmission losses and daily evaporation rates as well as estimates of water taken versus water ordered) monthly reconciliation (which requires monthly meter reading) must be accurate; and

(b) performing monthly reconciliations of each customer's individual water shares without timely and accurate usage data will lead to problems, including incorrect advice being provided to irrigators regarding water availability.

SunWater stated that if errors are not detected until the end of the quarter when SunWater undertakes an accurate reading, customers may have used too much water and, more importantly, used water held for other customers. If this were to eventuate, then SunWater would be in breach of its ROL.

In addition, if inaccurate information is provided, erroneous monthly reconciliations would lead to significant changes to available volumes in customers' water accounts. SunWater undertaking monthly meter reading ensures that these problems are avoided and helps to ensure that the full benefits of continuous sharing are experienced by customers.

In relation to stakeholders' concerns about the additional costs of administering continuous sharing arrangements, SunWater submitted that for a small scheme such as the St George WSS, where the necessary water accounting refinements have been managed through a combination of enhancements to SunWater's Information Management System and semi-automatic spreadsheet systems, the overall difference between the cost of continuous sharing and announced allocations is 'not significant'.

Conclusion

The Authority notes the recommendation made by GHD that costs associated with administering continuous sharing arrangements could be reduced through customers, as opposed to SunWater, reading meters on a monthly basis. GHD recommended that SunWater reads meters quarterly to verify previously recorded readings. The Authority notes that GHD did not quantify the savings that could be achieved by doing so.

The Authority sought advice from DERM on whether SunWater was required to read meters monthly in the St George WSS. DERM has advised that:

(a) it is a condition of SunWater's ROL, as prescribed by s323 of the Condamine and Balonne ROP, that SunWater record the total volume of water taken each quarter;

(b) under continuous sharing arrangements, it is a requirement of the ROP that each month (at a minimum) SunWater carry out a reconciliation of what is estimated to be in storage against what is actually in storage. While the ROP does not explicitly require monthly meter readings by any particular party, DERM noted that the reconciliation process is dependent on the volume of water delivered which is derived from meter readings; and

(c) imbalances can occur if there are errors in monthly meter readings. In addition, due to the nature of the reconciliation process there is a potential for inaccuracies to affect not just the allocation holder who has supplied incorrect information, but also other water users within the scheme.

The Authority notes that accurate monthly meter reading is required for SunWater to meet its regulatory obligations and to ensure the benefits of continuous sharing arrangements are achieved. SunWater is unable to delegate its regulatory responsibilities to irrigators.

There is therefore a risk that irrigators may provide inaccurate or not timely information to SunWater, who bears that risk. The Authority is not aware of any other irrigation service provider or regulated utility where customers provide data from their own meter reads to comply with regulatory obligations or for billing.

Accordingly, the Authority is inclined to the view that SunWater should continue to read meters on a monthly basis and has not made any specific adjustment to operations costs for customer meter reads.

In response to irrigators' concerns regarding the extent of costs incurred in administering continuous sharing arrangements, the Authority notes that SunWater has not provided a detailed submission on the quantum of the costs incurred in administering continuous sharing arrangements at the St George WSS. SunWater advised that in schemes such as St George, where the necessary water accounting refinements have been managed through a combination of the SunWater Information Management System (SWIMS) enhancements and semi-automatic spreadsheet systems, the overall difference between the cost of continuous sharing and announced allocations is not significant.

Additional scheme specific costs relate primarily to the change from quarterly to monthly meter reading. As outlined above, monthly meter readings are required to ensure that monthly balances are accurate enough to enable temporary trade between customers. The additional head office costs associated with the continuous water sharing arrangements are to cover daily processing to provide daily estimated balances of customers' accounts.

SunWater has confirmed that costs incurred are allocated between head-office and the schemes where continuous sharing arrangements are in place.

The Authority notes that GHD did not recommend any specific adjustment to operations costs.

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

In response to St George Irrigators regarding recreational costs, the Ministerial Direction requires the Authority to set prices that recover efficient recreation management costs.

The Authority notes Cooinda Cotton's submission that irrigators have no input into the operation of the scheme. The Authority has addressed the issue of further consultation in the Renewals Annuity chapter.

Item 2: Preventive and Corrective Maintenance

Stakeholder Submissions

SunWater

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

Preventive maintenance includes:

(a) condition monitoring – the inspection, testing or measurement of physical assets to report and record its condition and performance for determination of preventive maintenance requirements; and

(b) servicing – planned maintenance activities normally expected to be carried out routinely on physical assets.

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

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

SunWater identifies two types of corrective maintenance activities:

(a) emergency breakdown maintenance which refers to maintenance that has to be carried out immediately to restore normal operation or supply to customers or to meet a regulatory obligation (e.g. rectify a safety hazard); and

(b) non-emergency maintenance which refers to maintenance that does not have to be carried out immediately to restore normal operations, but needs to be scheduled in advance of the planned maintenance cycle.

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

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

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

Other Stakeholders

St George Irrigators (2011) submitted that they have difficulty imagining SunWater staff and/or contractors keeping an accurate record of whether they had performed preventive or corrective maintenance on a given day and whether there were any interaction effects with the renewal expenditure. St George Irrigators submitted that they would like to see a clear distinction between routine maintenance and renewal expenditure. They further considered that the issue papers suggest that SunWater wants to go to extraordinary lengths to apportion overhead costs accurately but seems less concerned about cost categories that directly affect the operational efficiency of the headworks, such as maintenance.

Authority's Analysis

GHD's Review

GHD considered that preventive maintenance activity was demonstrated at the site visits and is clearly being carried out in an appropriate manner. GHD stated that one of the gates was removed from service for maintenance. A servicing area was created to complete the stripping and repainting of the gate. The area was established to minimise environmental harm with spray capture devices and bundled work areas in place.

GHD stated that EJ Beardmore Dam is a referable dam and as a consequence has additional compliance requirements. SunWater is conducting preventive maintenance on the gates of the dam. Other preventive maintenance works are being programmed to be coincidental with the gate maintenance as the access to parts of the dam is enhanced while the gates are removed for maintenance.

GHD considered that under the risk management policy of SunWater, this requires monthly condition inspections and risk mitigations are in place for each asset. As a consequence, the direct opex is proportionally higher to manage this higher risk.

Corrective maintenance activity was also demonstrated to GHD while inspecting the assets. Explanation of the drivers for the maintenance was also discussed at length with SunWater. GHD stated that at the time of the asset inspections the prime driver was repairs post the significant flood event.

GHD stated that the Jack Taylor Weir is a substantial structure with mechanical gates and associated opening and closing mechanical and electrical infrastructure. The weir is also a main road access to St George with large heavy transport vehicles seen passing over the weir while GHD was inspecting the asset. GHD considered that the gate equipment and heavy traffic drive the requirement for SunWater to maintain and inspect this asset to a very high level. The asset was assessed as having a high operational requirement as a key aspect to the WSS and therefore the activity associated was considered by GHD to be well justified.

GHD advised that issues that have become apparent post the flood events are also being addressed to reduce the potential damages in future flood events. A specific example of this is the planning to move the emergency generator required to operate the dam. In its current location the generator would have been inundated by flood waters had the SunWater staff not removed it. SunWater is now looking to relocate the generator, or consider alternate emergency generator options.

GHD noted that preventive and corrective maintenance is forecast as a 62%/38% ratio. GHD considered that this is consistent with the requirements for weed management, compliance

inspections and reactive responses as required. GHD advised that considering the amount of mechanical and electrical equipment assets for this scheme this ratio is appropriate. GHD further considered that upon reviewing the ratios of the actual spend on preventive and corrective maintenance, that SunWater has found this to be the most appropriate balance for the assets in this scheme.

GHD stated that assessment of the distribution of preventive to corrective maintenance is problematic and would usually be conducted against system losses, unaccounted for water and non-revenue water evaluating reductions in these loses against the maintenance expenditure. GHD stated that the complication of natural watercourses used as the transport mechanism, a dam with a high ratio of surface area to depth, actions by other irrigators and so on make it extremely difficult to make this assessment. GHD advised that in applying engineering and operational management judgement, this ratio is determined as reasonable.

Dams and weirs are generally long-lived assets that combined with appropriate periodic maintenance programs can be retained in service indefinitely. The maintenance and inspection program is relatively static from year to year. GHD considered the forecast provided by SunWater reflects a static program of work to maintain the assets in this scheme.

GHD made no recommendations for adjustment to preventive and corrective maintenance for this scheme.

Conclusion

In Volume 1, the Authority accepted 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.

The Authority notes that GHD did not recommend any specific adjustment to costs.

In response to stakeholder comments in regard to allocation of costs between maintenance and renewals, the Authority notes that under SunWater's approach, maintenance expenditure incurred on a frequency of more than one year are included as renewals. The Authority notes that provided costs are not double counted, the allocation between corrective and preventive maintenance will not affect overall costs.

Item 3: Electricity

Stakeholder Submissions

SunWater

Electricity is used to pump water and operate major items of infrastructure.

The electricity cost for the bulk supply relates mainly to the operation of the EJ Beardmore Dam and Jack Taylor Weir.

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 have commented on these items.

Authority's Analysis

GHD's Review

GHD stated that electricity consumption is forecast to be higher during this period. GHD considered that the amount of equipment utilised in the preventive maintenance programs would easily account for the additional consumption of electricity.

GHD made no recommendations for adjustment to electricity for this scheme.

Conclusion

The Authority notes that GHD did not recommend any adjustment to costs.

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 also 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 has adjusted proposed electricity costs as set out in the table below.

Item 4: Other – Flood Management

Stakeholder Submissions

SunWater

SunWater advised that operations costs were exacerbated by the flood event of 2010.

Other Stakeholders

No other stakeholders have commented on these items.

Authority's Analysis

GHD's Review

GHD stated that additional costs have been incurred to maintain personnel levels at the dam during the recent flood events. The dam was staffed continuously during the floods to manage the situation and staff had to be located at the dam as the access from St George was cut off by floodwaters. GHD considered that these costs are reflected in the expenditure peaks. GHD advised that post the floods, dam infrastructure required repair to reinstate the damaged equipment. GHD also advised that recreation facilities were damaged and also required rehabilitation. SunWater is considering the impacts of these floods and are investigating the relocation of some of the infrastructure to lessen the impacts and damages in future flood events.

GHD made no recommendations for adjustment to SunWater's proposed costs for this scheme.

Conclusion

The Authority notes that GHD did not recommend any adjustment to costs.

Item 6: Cost Escalation

As noted in Volume 1, the Authority's consultants were required to examine the appropriateness of SunWater's proposed cost escalation methods.

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 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.

Conclusion

A comparison of SunWater's and the Authority's direct operating costs for the St George WSS is set out in Table 5.9.

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 5.9: Direct Operating Costs (Real $'000)

	SunWater					***Authority***				
	2006-07	***2007-08***	***2008-09***	***2009-10***	***2010-11***	***2011-12***	***2012-13***	***2013-14***	***2014-15***	***2015-16***
Operations	306	307	309	310	310	297	298	299	300	300
Electricity	9	9	10	11	12	7	8	8	8	9
Preventive maintenance	80	81	81	81	81	78	78	79	79	80
Corrective maintenance	50	50	51	51	51	49	49	49	50	50
Direct Operating Costs	**445**	**448**	**451**	**452**	**453**	**431**	**433**	**435**	**437**	**439**

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)

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 water pricing conversion factors (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

No other stakeholders have commented on this matter.

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 St George 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 5.10. The Authority's recommended operating costs are set out in Table 5.11.

Table 5.10: SunWater's Proposed Operating Costs for Activity by Type (Real '000)

	2012-13	*2013-14*	*2014-15*	*2015-16*	*2016-17*
Operations					
Labour	155	155	155	155	155
Materials	72	73	74	75	75
Contractors	16	17	17	17	17
Other	63	63	63	63	63
Non-direct	325	338	329	315	309
Preventive Maintenance					
Labour	69	69	69	69	69
Materials	9	9	9	9	9
Contractors	3	3	3	3	3
Other	0	0	0	0	0
Non-direct	142	148	144	138	135
Corrective Maintenance					
Labour	42	42	42	42	42
Materials	4	4	4	4	4
Contractors	3	3	3	3	3
Other	2	2	2	2	2
Non-direct	87	91	88	84	83
Electricity	9	9	10	11	12
Total	**999**	**1,025**	**1,011**	**989**	**981**

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

	2012-13	*2013-14*	*2014-15*	*2015-16*	*2016-17*
Operations					
Labour	150	151	152	153	154
Materials	70	70	71	71	71
Contractors	16	16	16	16	16
Other	61	61	60	60	59
Non-direct	316	324	310	292	283
Preventive Maintenance					
Labour	67	67	68	68	69
Materials	9	9	9	9	9
Contractors	2	3	3	3	3
Other	0	0	0	0	0
Non-direct	138	142	136	128	123
Corrective Maintenance					
Labour	41	41	41	42	42
Materials	3	4	4	4	4
Contractors	2	3	3	3	3
Other	2	2	2	2	2
Non-direct	85	87	83	78	76
Electricity	7	8	8	8	9
Total	**969**	**986**	**966**	**935**	**920**

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 supply delivered from 22 SunWater bulk water schemes and eight distribution systems and, for relevant schemes, for drainage, drainage diversion and water harvesting.

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

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

(a) prudent and efficient expenditure on renewing and rehabilitating existing assets through a renewals annuity; and

(b) efficient operational, maintenance and administrative costs to ensure the continuing delivery of water services.

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

The Ministerial Direction also requires that:

(a) where current prices are above the level required to recover prudent and efficient costs, current prices are to be maintained in real terms;

(b) where cost-reflective prices are above current prices, the Authority must consider recommending price paths to moderate price impacts on irrigators, whilst having regard to SunWater's commercial interests; and

(c) for certain schemes or segments of schemes [hardship schemes], prices should increase in real terms at a pace consistent with 2006-11 price paths, until such time as the scheme reaches the level required to recover prudent and efficient costs.

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

Previous Review

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

For this scheme, prices over 2006-11 increased in real terms to achieve lower bound costs in 2007-08, and were increased by CPI thereafter. In 2011-12, prices in this scheme were also increased by CPI and $1.00 per ML.

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

Table 6.1: Total Costs for the St George WSS (Real $'000)

	Actual Costs						*Future Costs*				
	2006-07	*2007-08*	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*	*2016-17*
SunWater's Submitted Costs	1,615	1,416	762	1,697	2,321	1,698	1,737	1,758	1,737	1,709	1,701
Renewals Annuity	64	256	280	259	256	760	750	745	738	732	732
Operating Costs	1,571	1,198	493	1,464	2,088	950	999	1,025	1,011	989	981
Revenue offset	-19	-39	-11	-26	-22	-12	-12	-12	-12	-12	-12
Authority's Total Costs	-	-	-	-	-	-	1,611	1,621	1,590	1,554	1,530
Renewals Annuity	-	-	-	-	-	-	653	646	636	630	621
Operating Costs	-	-	-	-	-	-	969	986	966	937	920
Revenue offset	-	-	-	-	-	-	-12	-12	-12	-12	-12
Return on Working Capital	-	-	-	-	-	-	1	1	1	1	1

Note: Costs are presented for the total service contract (all sectors). Costs reflect SunWater's latest data provided to the Authority in October 2011 and may differ from the NSP. Source: Actual Costs (SunWater, 2011ap) and Total Costs (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.

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

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

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

(b) all other activities and expenditure types (costs) would be expected to be semi-variable, including: labour, material, contractor and other direct costs, maintenance, operations and renewals expenditures;

(c) costs that *actually* varied with water use in 2006-11, by activity and by type:

  (i) by activity, Indec found that operations, preventive and corrective maintenance and renewals were semi-variable. Electricity was generally highly variable with water

use in five distribution systems and two bulk schemes. In three distribution systems electricity pumping costs were semi-variable due to gravity feed;

(ii) by type, Indec found that labour, materials, contractors and other direct costs were semi-variable. Non-direct costs were fixed;

(d) costs that should vary with water use under Indec's proposed optimal (prudent and efficient) management approach (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 St George WSS, Indec recommended 95% of costs should be fixed and 5% variable under optimal management. The Authority notes that this ratio differs from the current tariff structure which reflects the recovery of 85% of costs in the fixed charge and 15% of costs in the volumetric charge. The Authority notes that this ratio applied to both tariff groups of Beardmore Dam/Balonne River and Thuraggi Watercourse.

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 the table below.

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	1.530	1,540	1,510	1,476	1,453
High Priority	0	0	0	0	0
Medium Priority	1,355	1,363	1,336	1,307	1,286
Distribution Losses	176	177	173	169	167

Note: Net fixed costs is 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 using SunWater's forecast usage data, based on the eight year historical average water use 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 94.2% 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 St George 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 – Beardmore Dam/Balonne River											
Fixed (Part A)	13.56	14.44	15.12	15.60	16.08	17.64	18.20	18.66	19.12	19.60	20.09
Volumetric (Part B)	2.81	3.00	3.14	3.24	3.34	3.46	1.06	1.09	1.12	1.14	1.17
River – Thuraggi Watercourse											
Fixed (Part A)	13.56	14.44	15.12	15.60	16.08	17.64	18.20	18.66	19.12	19.60	20.09
Volumetric (Part B)	2.81	3.00	3.14	3.24	3.34	3.46	1.06	1.09	1.12	1.14	1.17

Note: 2011-12 prices include the interim increase of $1/ML in addition to CPI. Source: Actual Prices (SunWater, 2011al) and Recommended 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. For this

scheme, current revenues are above the level required to recover prudent and efficient costs (Table 6.). Therefore, the Authority is required to recommended prices that maintain revenues in real terms for the 2012-17 regulatory period.

Table 6.4: Comparison of Current Prices and Cost-Reflective Prices

Tariff and Priority Group	*2010/11 Prices (indexed to 2012-13)*		*Irrigation WAE (ML)*	*Water Use (ML)*	*Current Revenue*	*Revenue from Cost-Reflective Tariffs*	*Difference*
	Fixed	*Variable*					
St George WSS	$16.89	$3.51	72,794	57,199	$1,430,502	$1,385,735	$44,767

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

6.8 The Authority's Recommended Prices

The Authority's recommended prices to apply to the St George WSS for 2012-17 are outlined in **Error! Reference source not found.**, 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: Prices for St George 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 – EJ Beardmore Dam/Balonne River											
Fixed (Part A)	13.56	14.44	15.12	15.60	16.08	17.64	18.73	19.19	19.67	20.17	20.67
Volumetric (Part B)	2.81	3.00	3.14	3.24	3.34	3.46	1.06	1.09	1.12	1.14	1.17
River – Thuraggi Watercourse											
Fixed (Part A)	13.56	14.44	15.12	15.60	16.08	17.64	18.73	19.19	19.67	20.17	20.67
Volumetric (Part B)	2.81	3.00	3.14	3.24	3.34	3.46	1.06	1.09	1.12	1.14	1.17

Note: 2011-12 prices include the interim increase of $1/ML in addition to CPI. Source: Actual Prices (SunWater, 2011al) 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).

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APPENDIX A: FUTURE RENEWALS LIST

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

Asset	*Year*	*Description*	*Value ($'000)*
Balonne River Distribution	2022-23	Replace 422212B Beardmore Dam Hw	36
Beardmore Pump Station	2021-22	Replace Machinery Shed	14
Beardmore Wtp	2012-13	Study: Options analysis on future spend of $65K in 2014/16 - Pass ownership to Council?	12
	2013-14	14SGAXX AUTOMATION OF TWS SYSTEM	28
	2015-16	Replace Monitoring Equipment	46
	2019-20	Replace Security Fence	24
	2029-30	Replace Lime & Alum Shed	11
	2030-31	Replace Monitoring Equipment	45
	2031-32	Replace Clarifying Tank	58
Ej Beardmore Dam	2011-12	Refurbish:regrade embankment to design profile	53
		12SGAXX D/S FACE FULL BLAST AND PAINT	41
		12SGAXX U/S FACE -CP MAINT AND PAINTING	15
		Remove .watering system from embankment	12
		Remove watering system from top of embankment	12
	2012-13	12SGAXX REPLACE GATE	217
		13SGAXX STUDY: 5YR DAM SAFETY INSPECTION	88
		13SGAXX REFURB:D/S FACE BLAST AND PAINT	46
		13SGAXX REFURB:ROTORK, MID LIFE OVERHAUL	34
		13SGAXX RELOCATE GENERATOR (5YDS REP).	26
		13SGAXX REFURB HOISTING MECHANISM - GT 1	11
		13SGAXX REFURB HOISTING MECHANISM - GT 2	11
		13SGAXX REFURB HOISTING MECHANISM - GT 3	11
		13SGAXX REFURB HOISTING MECHANISM - GT 4	11
		13SGAXX REFURB HOISTING MECHANISM - GT 5	11
		13SGAXX REFURB HOISTING MECHANISM - GT 6	10
	2013-14	14SGAXX REFURB:D/S FACE BLAST AND PAINT	47
		Upgrade Thuraggi metering	38
		Study: 5yr Dam Comprehensive Inspection (Review of EAPs, O&M, SOPs)	25
		14SGAXX STUDY:REFURB ALL CABLES & CBLWYS	17
		14SGAXX REFURB HOISTING MECHANISM - GT 7	11
		14SGAXX REFURB HOISTING MECHANISM - GT 8	11
		14SGAXX REFURB HOISTING MECHANISM - GT 9	11
		14SGAXX REFURB HOISTING MECHANISM - GT10	11
		14SGAXX REFURB HOISTING MECHANISM - GT11	11
		14SGAXX REFURB HOISTING MECHANISM - GT12	10
	2014-15	Refurbish: Repair scouring and undermining of dental concrete in spillway apron and dissipator area	63
		Clean out foundation drains located in dam gallery	60
		Refurbish: Full paint upstream face and CP maintenance	50
		Refurbish:Downstream face Full blast and paint	50
		Refurbish: Part replacement of components due to	38

Asset	*Year*	*Description*	*Value ($'000)*
		obselecence.4 Small boards and one Main Board	
		Refurbish: Paint Steel work; Confirmed through condition assessment	25
		Refurbish: trashracks need replacing / possibly only recoating.Need Diver to retrieve brought forwar	19
		11SGA11 REFURB U/S FACE CP AND PAINTING	17
		Refurbish:. Patch paint	13
	2015-16	Refurbish: Upstream Face full paint and CP maintenance	150
		Refurbish:Downstream face Full blast and paint	50
		Replace Control	16
		12SGAXX U/S FACE -CP MAINT AND PAINTING	16
		Refurbish: 1. 2*X15Trash racks, MS painted, 40 yr life	12
	2016-17	12SGAXX REPLACE GATE	223
		Refurbish: Upstream Face full paint and CP maintenance	149
		Refurbish:Downstream face Full blast and paint	50
		Refurbish: Regrade and repair gravel roads to pump station - Carried out; brought forward from 2003	37
		Refurbish: Full paint, and new seals	25
		Replace Compressor	22
	2017-18	Replace Cables & Cableways	285
		Refurbish: Upstream Face full paint and CP maintenance	148
		13SGAXX STUDY: 5YR DAM SAFETY INSPECTION	85
		Refurbish:Downstream face Full blast and paint	49
	2018-19	Study: 5yr Dam Comprehensive Inspection (Review of EAPs, O&M, SOPs)	25
		11SGA11 REFURB U/S FACE CP AND PAINTING	16
	2019-20	Clean out foundation drains located in dam gallery	59
		Replace Instrumentation - Main Wall.	58
		Replace Switchboard	33
		12SGAXX U/S FACE -CP MAINT AND PAINTING	16
	2020-21	11SGAXX XRAY EXAMINATION OF WINCH ROPES	232
		Refurbish: trashracks need replacing / possibly only recoating.Need Diver to retrieve brought forwar	19
		Refurbish Hoisting Mechanism - Beardmore Dam Gate 1	15
		Refurbish Hoisting Mechanism - Beardmore Dam Gate 2	15
		Refurbish Hoisting Mechanism - Beardmore Dam Gate 3	15
		Refurbish Hoisting Mechanism - Beardmore Dam Gate 4	15
		Refurbish Hoisting Mechanism - Beardmore Dam Gate 5	15
		Refurbish Hoisting Mechanism - Beardmore Dam Gate 6	15
	2021-22	Refurbish:regrade embankment to design profile	56
		Refurbish: Part replacement of components due to obselecence.4 Small boards and one Main Board	37
		Refurbish Hoisting Mechanism - Beardmore Dam Gate 10	15
		Refurbish Hoisting Mechanism - Beardmore Dam Gate 11	15
		Refurbish Hoisting Mechanism - Beardmore Dam Gate 12	15
		Refurbish Hoisting Mechanism - Beardmore Dam Gate 7	15
		Refurbish Hoisting Mechanism - Beardmore Dam Gate 8	15
		Refurbish Hoisting Mechanism - Beardmore Dam Gate 9	15
		Replace Trash Screens	13

Asset	*Year*	*Description*	*Value ($'000)*
	2022-23	Study: 20yr Dam Safety Review (by 1 Dec 2022)	123
		13SGAXX STUDY: 5YR DAM SAFETY INSPECTION	83
		11SGA11 REFURB U/S FACE CP AND PAINTING	16
	2023-24	Study: 5yr Dam Comprehensive Inspection (Review of EAPs, O&M, SOPs)	25
		12SGAXX U/S FACE -CP MAINT AND PAINTING	16
	2024-25	Replace BUOYLINE	100
		Clean out foundation drains located in dam gallery	59
		Refurbish : Full paint of gate	37
	2025-26	Replace Trash Screens	19
	2026-27	Replace Winch, Perrin Eng	1,411
		Refurbish:Downstream face Full blast and paint	49
		Refurbish: trashracks need replacing / possibly only recoating.Need Diver to retrieve brought forwar	18
		11SGA11 REFURB U/S FACE CP AND PAINTING	16
		Replace Main System	12
	2027-28	Replace Winch, Perrin Eng	1,410
		13SGAXX STUDY: 5YR DAM SAFETY INSPECTION	83
		Refurbish:Downstream face Full blast and paint	49
		12SGAXX U/S FACE -CP MAINT AND PAINTING	16
		Refurbish: 1. 2*X15Trash racks, MS painted, 40 yr life	12
	2028-29	Replace Winch, Perrin Eng	1,417
		Refurbish: Part replacement of components due to obselecence.4 Small boards and one Main Board	37
		Study: 5yr Dam Comprehensive Inspection (Review of EAPs, O&M, SOPs)	25
	2029-30	Replace Winch, Perrin Eng	1,406
		10SGA10 PAINT GATES- 8 /9/ 10- D/S FACE	127
		Clean out foundation drains located in dam gallery	59
		10SGA20- REPLACE PEIZO GAUGE BOARD WITH	54
	2030-31	11SGAXX XRAY EXAMINATION OF WINCH ROPES	230
		11SGAXX BLAST AND PAINT DOWNSTREAM FACE	92
		Refurbish: Regrade and repair gravel roads to pump station - Carried out; brought forward from 2003	37
		11SGA11 REFURB U/S FACE CP AND PAINTING	16
		Replace Control	16
	2031-32	Refurbish:regrade embankment to design profile	55
		12SGAXX D/S FACE FULL BLAST AND PAINT	43
		12SGAXX U/S FACE -CP MAINT AND PAINTING	16
		Replace Generating Building Structure	12
	2032-33	13SGAXX STUDY: 5YR DAM SAFETY INSPECTION	84
		13SGAXX REFURB:D/S FACE BLAST AND PAINT	47
		13SGAXX REFURB:ROTORK, MID LIFE OVERHAUL	33
		08SGA-THURAGGI OUTLET - Install Security	24
		Refurbish: trashracks need replacing / possibly only recoating.Need Diver to retrieve brought forwar	18
		Refurbish: M2. Rotork, mid life overhaul	12
	2033-34	Replace Ladders, Handrails & Stairways	266
		14SGAXX REFURB:D/S FACE BLAST AND PAINT	47

Asset	*Year*	*Description*	*Value ($'000)*
		Study: 5yr Dam Comprehensive Inspection (Review of EAPs, O&M, SOPs)	25
	2034-35	Clean out foundation drains located in dam gallery	59
		Replace Instrumentation - Main Wall.	57
		Refurbish: Full paint upstream face and CP maintenance	49
		Refurbish:Downstream face Full blast and paint	49
		Refurbish: Paint Steel work; Confirmed through condition assessment	25
		11SGA11 REFURB U/S FACE CP AND PAINTING	16
		Refurbish:. Patch paint	12
	2035-36	Refurbish: Upstream Face full paint and CP maintenance	147
		Refurbish:Downstream face Full blast and paint	49
		Refurbish: Part replacement of components due to obselecence.4 Small boards and one Main Board	37
		12SGAXX U/S FACE -CP MAINT AND PAINTING	16
Jack Taylor Weir	2011-12	12SGAXX - reinstatement of Outlet works	282
		Study: 5yr Dam Comprehensive Inspection	18
	2012-13	12SGAXX BLST & PAINT GATE GUIDES/INST CP	114
		13SGAXX REPLACE GATE SEALS	15
	2013-14	Carry out repairs as per design (2011) to wingwalls, retaining walls, apron slabs and rockpitching	272
		14SGAXX BLAST AND PAINT GANTRY BEAM	37
		Study: Investigate requirements and scope for replacement control equipment in 2014	18
		14SGAXX STUDY:REFURB ALL CABLES & CBLWYS	12
	2014-15	Refurb of hoist mechanisms on gates	113
		Replace Control Equipment	91
		Replace Starter, 0-30Kw Auto (3 Off)	19
		Study: Failure Impact Assessment	10
	2015-16	Refurb of hoist mechanisms on gates	131
	2016-17	Study: 5yr Dam Comprehensive Inspection	19
	2019-20	Replace Cables & Cableways	49
		Study re Just in Time replacement of winches at JTW rather than replace all as per replacment life	31
	2020-21	11SGAXX XRAY EXAMINATION OF WINCH ROPES	69
		Replace Motor, Armstrong Siddeley Diesel	19
	2021-22	Replace Winch	946
		Study: 5yr Dam Comprehensive Inspection	19
	2022-23	Replace Winch	2,103
	2024-25	Replace BUOYLINE	71
		Replace Electrical Services	12
	2025-26	11SGAXX REFURB GATE GUIDES. INSTALL CP	188
	2026-27	Study: 5yr Dam Comprehensive Inspection	18
	2027-28	12SGAXX BLST & PAINT GATE GUIDES/INST CP	113
	2028-29	Replace Gate Valve	48
	2029-30	Replace Control Equipment	89
		Replace Starter, 0-30Kw Auto (3 Off)	18
	2030-31	11SGAXX XRAY EXAMINATION OF WINCH ROPES	68
	2031-32	Study: 5yr Dam Comprehensive Inspection	18

Asset	*Year*	*Description*	*Value ($'000)*
	2032-33	Replace Switchboard, Primary Gate Operation	98
		Replace Auxiliary Supply	73
		08SGA-JTW- Install Security Fencing	35
		13SGAXX REPLACE GATE SEALS	15
	2034-35	Refurb of hoist mechanisms on gates	111
	2035-36	Refurb of hoist mechanisms on gates	129
Moolabah Weir	2011-12	12SGAXX - Repairs to Crest and back face	250
	2015-16	Replace Regulating Gates	26
	2022-23	Replace Trash Screen	73
		10SGA14 PAINT SCREEN AND GUIDES	28
	2034-35	10SGA14 PAINT SCREEN AND GUIDES	28