QUEENSLAND COMPETITION AUTHORITY

Draft Report

SunWater
Irrigation Price Review: 2012-17
Volume 2
Emerald Distribution System

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 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 Emerald Distribution System for the 2012-17 regulatory period are outlined in Tables 1 and 2 together with actual prices since 1 July 2006.

The Authority's Recommended Prices

The Authority's recommended prices to apply to the Emerald Distribution System for 2012-17 are outlined in Tables 1 and 2 together with actual prices since 2006-07.

Table 1: Medium Priority Prices for the Emerald Distribution System ($/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 (Unbundled)											
Fixed (Part A)	5.12	5.28	5.52	5.72	5.88	6.08	10.05	10.30	10.55	10.82	11.09
Volumetric (Part B)	6.73	6.93	7.26	7.49	7.71	7.99	1.10	1.12	1.15	1.18	1.21
Channel (Unbundled)											
Fixed (Part C)	12.56	12.88	13.52	13.92	14.36	16.88	14.34	16.75	19.27	20.84	21.36
Volumetric (Part D)	6.1	6.28	6.58	6.78	7.00	7.25	8.26	8.47	8.68	8.90	9.12
Channel (Bundled)											
Fixed (Part A)	17.68	18.16	19.04	19.64	20.24	22.96	nr	nr	nr	nr	nr
Volumetric (Part B)	12.83	13.21	13.84	14.27	14.71	15.24	nr	nr	nr	nr	nr

Note: nr - not relevant. Prior to 2012-17, channel tariffs were a bundled price for bulk and distribution services. Thus, the fixed Part C tariffs for 2006-12 represent a notional unbundled channel price calculated by deducting Part A River prices from (bundled) Part A Channel prices. Source: Actual Prices (SunWater, 2011a) and Recommended Prices (QCA, 2011).

Although prices for bulk costs of the Nogoa-Mackenzie WSS are presented above, the review of the underlying bulk costs is set out in detail as part of a separate report on the Nogoa-Mackenzie WSS.

Table 2: High Priority Prices for the Emerald Distribution System ($/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 (Unbundled)											
Fixed (Part A)	12.80	13.20	13.80	14.24	14.68	15.20	21.29	23.87	25.48	26.12	26.77
Volumetric (Part B)	6.73	6.93	7.26	7.49	7.71	7.99	1.10	1.12	1.15	1.18	1.21
Channel (Unbundled)											
Fixed (Part C)	31.40	32.32	33.80	34.88	35.92	39.20	32.99	31.76	31.55	32.34	33.15
Volumetric (Part D)	6.10	6.28	6.58	6.78	7.00	7.25	8.26	8.47	8.68	8.90	9.12
Channel (Bundled)											
Fixed (Part A)	44.20	45.52	47.60	49.12	50.60	54.40	nr	nr	nr	nr	nr
Volumetric (Part B)	12.83	13.21	13.84	14.27	14.71	15.24	nr	nr	nr	nr	nr

Note: nr - not relevant. Prior to 2012-17, channel tariffs were a bundled price for bulk and distribution services. Thus, the fixed Part C tariffs for 2006-12 represent a notional unbundled channel price calculated by deducting Part A River prices from (bundled) Part A Channel prices. Source: Actual Prices (SunWater, 2011am) and Recommended Prices (QCA, 2011).

The Authority's recommended termination fees to apply to the Emerald Distribution System in 2012-17 are outlined in Table 3 together with actual termination fees since 1 July 2008.

Table 3: Termination Fees ($/ML)

	Actual Prices				*Recommended Prices*				
	2008-09	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*	*2016-17*
Medium Priority	121.05	119.42	135.50	174.11	305.74	313.38	321.22	329.25	337.48
High Priority	302.61	299.24	338.95	404.33	305.74	313.38	321.22	329.25	337.48

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

The Authority's recommended drainage and drainage diversion charges to apply to the Emerald Distribution System in 2012-17 are outlined in Tables 4 and 5 together with actual drainage and drainage diversion charges since 1 July 2006.

Table 4: Drainage Charges ($/ha of land)

	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*
Drainage Charges (Irrigable Land)	18.75	19.33	20.25	20.85	21.45	22.20	22.76	23.32	23.91	24.50	25.12
Drainage Charges (Non-Irrigable Land)	4.70	4.85	5.05	5.20	5.35	5.50	5.64	5.78	5.92	6.07	6.22

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

Table 5: Drainage Diversion Charges ($/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*
Up to 2 ML	191.00	191.00	191.00	191.00	191.00	191.00	195.78	200.67	205.69	210.83	216.10
Between 2 & 100 ML	6.55	6.55	6.55	6 55	6.55	6.55	6.71	6.88	7.05	7.23	7.41

Source: Actual Prices (SunWater, 2011am) 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 expenditures and cost allocations, 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 Nogoa-Mackenzie WSS.

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. EMERALD DISTRIBUTION SYSTEM

1.1 System Description

The Emerald Distribution System, which draws its supply from Nogoa-Mackenzie, has 147 customers. Medium and high priority water access entitlements (WAE) are outlined in Table 1.1. To deliver water to these customers, SunWater owns WAEs for distribution losses.

Table 1.1: Water Access Entitlements

Customer Group	*Irrigation WAE (ML)*	*Total WAE (ML)*
Medium Priority	86,145	86,145
Medium Priority Distribution Losses	22,490	22,490
High Priority	1,172	1,172
High Priority Distribution Losses	6,840	6,840
Total	116,647	116,647

Note: Emerald Distribution System WAE is included in the total Nogoa-Mackenzie water supply scheme (WSS) WAE of 235,323 ML. All distribution customers in Emerald are irrigators hence there is no difference between irrigation and total WAEs. Source: SunWater (2011ao).

1.2 Distribution System Infrastructure

The Emerald Distribution System diverts water from the Fairbairn Dam[1] to two sub-systems: Selma and Weemah. The system consists of five pump stations, 126 km of channels and 144 km of drains.

The Selma sub-system

The Selma sub-system is normally supplied from the Fairbairn Dam gravity outlet, but when the dam's storage level drops to a certain level, the Selma Pump Station is brought online. The gravity-fed regulating gates must be closed when the pumps are operating.

The Selma Pump Station is located beside the Fairbairn Dam spillway. It can supply up to 800 ML/day depending on the storage level. The Selma sub-system also has four relift pump stations, three on the Main Channel and the fourth on a subsidiary channel.

The Selma Main Channel is 46.7 km long and supplies subsidiary channels totalling a further 26.8 km. It was designed to supply 612 ML/day and is fully automated from the channel inlet at Fairbairn Dam down to the 21 km check structure.

The Weemah sub-system

The Weemah sub-system is supplied from the Fairbairn Dam gravity outlet. In 2005-06, the gravity outlet was upgraded with the addition of a siphon to enable SunWater to meet the dam's Resource Operations Plan (ROP) pass-flow requirements. The siphon is also used to supplement the gravity flow into the Weemah Channel.

[1] The Fairbairn Dam and other bulk infrastructure are described in a separate report on the Nogoa-Mackenzie WSS.

The Weemah Main Channel is 52.6 km long and was designed to supply 305 ML/day. Most of the Weemah System consists of open earthen channels with manually operated regulating structures.

Drainage Infrastructure

The Emerald drainage system has been provided to remove farm and storm runoff with 144 km of surface drainage systems providing services to customers in both Emerald Distribution System sub-systems. Customers are required to discharge water from their farms through the drain inlet/s provided.

The location of the Emerald Distribution System and key infrastructure is shown in Figure 1.1.

1.3 Network Service Plans

The Emerald Distribution System network service plan (NSP) presents SunWater's:

(a) existing service standards;

(b) forecast operating and renewals costs, including the proposed renewals annuity; and

(c) risks relevant to the NSP and possible reset triggers.

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

1.4 Consultation

The Authority has consulted extensively with SunWater and other stakeholders throughout this review on the basis of the NSPs and supporting information. To facilitate the review, the Authority has:

(a) invited submissions from interested parties;

(b) met with stakeholders to identify and discuss relevant issues (two rounds of consultation);

(c) published notes on issues arising from each round of consultation;

(d) commissioned independent consultants to prepare issues papers and review aspects of SunWater's submissions;

(e) published all issues papers and submissions on its website; and

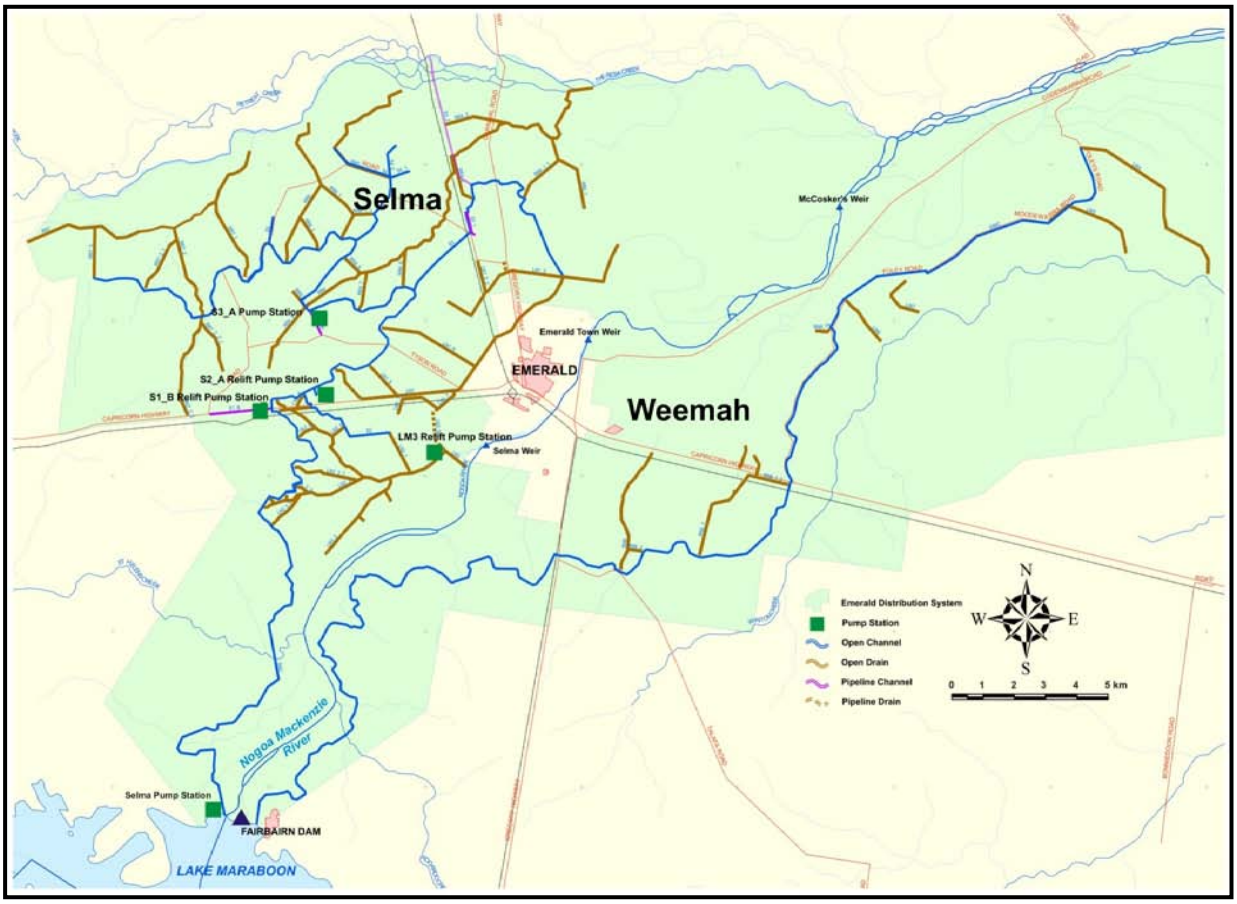
(f) considered all submissions and reports in preparing this Draft Report for comment.

The Authority has also received a number of submissions from stakeholders on matters such as capacity to pay, rate of return on existing assets, contributed assets, 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.

Figure 1.1: Emerald Distribution System Locality Map



Source: SunWater (2011).

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 paths, the Nogoa-Mackenzie WSS Tier 2 group (including representatives from the Emerald Distribution System) 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 Emerald Distribution System:

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

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

(c) the introduction of water planning and management charges in respect of SunWater's distribution loss entitlements for channel distribution systems;

(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) the availability of chemicals to control submerged weeds and algae in channels; and

(h) outbreak of noxious weeds.

Other Stakeholders

Cotton Australia/Queensland Farmers' Federation (QFF, 2011b) commented on the risks identified by SunWater:

(a) noting that electricity costs only make up 5% of total costs;

(b) in respect of a government resource management charge levied on loss WAEs, SunWater is only exposed to 10% of the total risk, as SunWater hold approximately 10% of total scheme WAEs while irrigators hold the remaining WAEs;

(c) SunWater should identify where it is not capable of managing risks to assets by stating how large is the risk in dollar terms and how big is the risk in probability terms;

(d) QCA levies or charges relevant to the scheme should be declared now, not during the price path;

(e) regarding metering costs related to changes in regulatory standard, irrigators are exposed to the most risk as this cost will ultimately be charged to them. SunWater will use its renewals annuity to fund this and pass the cost on during the following price path; and

(f) it is unclear what is the risk of weeds and algae to SunWater, since weeds and algae affect peak flows to irrigators and SunWater does not guarantee peak flows to irrigators.

2.3 Authority's Analysis

General Risks

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 Table 2.1 below.

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

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

Source: QCA (2011).

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

Any costs of the nature of (c) would be passed through, subject to a consideration of their materiality.

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 this investigation.

In respect of Cotton Australia/QFF's comments, the Authority notes that:

(a) electricity costs proposed by SunWater in its NSP are reviewed as part of the Authority's analysis of efficient operating costs. It is noted that electricity costs for Emerald Distribution may vary according to the level of water stored in Fairbairn Dam. For example, at current high water levels, electricity costs are much lower. Adjustments due to changes in electricity purchase arrangements or due to any price on carbon can be passed through to customers by an end-of-period adjustment, price trigger or cost pass through;

(b) the cost to SunWater of government imposts that are not controllable by SunWater should be passed to customers – as in a competitive market – as a cost of doing business provided that they are material. At this stage, the Authority has received no details of any proposed water planning and management charges;

(c) SunWater is responsible for managing risks to assets as it is best placed to do so as owner and manager of these assets. The relevant prudent and efficient cost of insurance is passed through to customers. Any damage to SunWater assets not covered by insurance would not automatically be passed through to customers. SunWater would need to demonstrate that it appropriately managed the risk of damage to assets and its response was prudent and efficient. Such costs could be addressed as an end-of-period adjustment or trigger a price review;

(d) as noted above, there are no levies or charges to be applied by the Authority;

(e) the Authority has been directed not to consider additional costs associated with any metering upgrades arising from changes to standards. Should these arise during the price path, they may be dealt with by an end-of-period adjustment or cost pass through if justified; and

(f) in respect of the risk of weeds and algae, SunWater is responsible for managing this risk, and incurring relevant costs, as SunWater is responsible for ensuring available water is delivered when required by customers. The efficient cost of doing so is incorporated in proposed prices. As with other costs, end-of-period adjustments could be considered if material unexpected costs are incurred (and are justifiable).

3. PRICING FRAMEWORK

3.1 Tariff Structure

Introduction

In the 2006-11 price paths, tariffs incorporated bulk and distribution costs into a bundled two-part tariff. During the 2005-06 price negotiations, it was generally agreed to adopt 70:30 ratio of fixed costs to variable costs. However, due to the prevailing Government policy that there should be no real price decreases, fixed charges were set at 63% and variable charges at 37% of total revenues in this scheme.

Stakeholder Submissions

SunWater

For the 2012-17 regulatory period, SunWater proposed to unbundle charges so that the recovery of distribution costs is separated from bulk water costs.

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

Other Stakeholders

Cotton Australia/QFF (2011a) proposed that if part of the distribution charge was variable it should at least be passed on to a new channel owner of the allocation.

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.

Unbundling of tariffs further promotes cost reflectivity of charges.

The Authority's analysis of which service delivery costs are fixed and which are variable, is addressed in a subsequent chapter.

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 Nogoa-Mackenzie 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	0	985	3,397	213	2,890	3,987	1,814	2,769
Temporary	42,904	29,883	31,276	46,905	33,876	29,801	94,532	57,795

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

Annual volumes of trades are generally material when viewed against the total WAEs in the scheme and therefore play an ongoing significant role in the efficient allocation of water for this scheme.

The Authority recognises that a change in tariff structure may impact the value of entitlements, and therefore incentives to trade. This matter is addressed further below in the context of pricing recommendations.

In respect of Cotton Australia/QFF's concern, it is noted that the variable component of a distribution charge is passed on to a new channel owner of the allocation.

3.2 Termination (Exit) Fees

Introduction

SunWater charges termination fees when a distribution system WAE is permanently transferred to the river. Without a termination fee, SunWater would have insufficient revenue to cover that customer's share of fixed costs.

Stakeholder Submissions

SunWater

In 2011-12, SunWater charged the exiting user the present value of 10 years of annual fixed distribution charges or 9.4 times (including GST) the distribution system fixed charge, which SunWater submitted is consistent with Australian Competition and Consumer Commission (ACCC) guidelines. SunWater treated such fees as revenue offsets for 10 years with any subsequent revenue shortfall recovered from remaining distribution system customers.

Other Stakeholders

Cotton Australia/QFF (2011b) submitted that the relationship between the water charge and exit (termination) fees required consideration, because if the Part A charge becomes too high it would flow into higher exit fees and impede trading.

For Emerald, Cotton Australia/QFF calculated a Part A charge of around $30.39/ML on the basis of SunWater's NSP. If a multiple of this (higher Part A charge) was used to determine an exit (termination) fee, as is currently the case, it could result in exit fees comprising 50% of farm value upon sale. If so, banks may stop channel water users from trading water separate to land, to protect their mortgages. An increase in water charges (and therefore termination fees) could therefore impede trading and ensuring water flows to its most productive end use, and devalue channel land and water.

Cotton Australia/QFF submitted that if SunWater's approach was adopted, there is a possibility that half of all channel allocations would be transferred to the river before the start of the price path and there would be unviable farms incurring large ongoing costs.

Authority's Analysis

In Volume 1, the Authority noted that the purpose of a termination fee is to ensure that a customer's departure does not result in a financial cost to SunWater or remaining customers. Further, in structuring the termination fee, there should be an incentive to SunWater to reduce costs following a customer's departure.

As proposed by SunWater, the Authority recommended a planning period of 20 years for the calculation of the renewals annuity and an annual rolling (recalculation of the) annuity (discounted by the Authority's recommended Weighted Average Cost of Capital - WACC). Consistent with this approach, the Authority recommended that the termination fee for each year will reflect 20 years of fixed costs (which include forecast renewals and fixed operating expenditure), although due to the rolling annuity approach over the five-year regulatory period, 24 years of data will be incorporated.

The Authority has recommended that costs not recovered via the termination fee are not to be passed on to customers in the form of higher (future) annual water charges. By not recovering all fixed costs, SunWater has an incentive to reduce costs or seek out new customers.

The Authority's approach results in a multiple of about 13.8 times the unbundled Part C tariff for the distribution system (close to the ACCC's guidance of up to 11). This compares with SunWater's 2011-12 termination fees (for high and medium priority) which reflect 9.4 times the 2011-12 distribution system fixed charge.

SunWater's past termination fees and the Authority's recommended termination fees, including annual increases are detailed in Table 3.2 (medium priority) and 3.3 (high priority).

The Authority's recommended termination fees are higher than those charged by SunWater, as the Authority's approach:

(a) recovers 20 years of fixed costs with SunWater bearing the remaining fixed costs. SunWater's approach recovers 10 years of fixed costs with remaining fixed costs paid for by other users;

(b) reflects the Authority's estimate of fixed costs in the cost-reflective fixed charge. The Authority's cost-reflective fixed charge recovers all fixed costs. SunWater's fixed charges recover only a portion of fixed costs. Therefore, some fixed costs are excluded from SunWater's termination fees;

(c) reflects the Authority's cost-reflective fixed charge and not the Authority's recommended fixed charge;

(d) results in a multiple of up to 13.8 times the Authority's cost reflective fixed charge. SunWater's multiple is up to 9.4 of its fixed charge (Chapter 3).

Table 3.2: Medium Priority Termination Fees

	Actual				*Recommended*				
	2008-09	***2009-10***	***2010-11***	***2011-12***	***2012-13***	***2013-14***	***2014-15***	***2015-16***	***2016-17***
Termination Fee ($/ML)	121.05	119.42	135 50	159.28	257.87	264.32	270.93	277.70	284.64
Change from previous year (%)		-1.3%	13.5%	17.5%	61.9%	2.5%	2.5%	2.5%	2.5%

Source: SunWater (2011al.).

Table 3.3: High Priority Termination Fees

	Actual				*Recommended*				
	2008-09	***2009-10***	***2010-11***	***2011-12***	***2012-13***	***2013-14***	***2014-15***	***2015-16***	***2016-17***
Termination Fee ($/ML)	302.61	299.24	338 95	369.90	257.87	264 32	270.93	277.70	284.64
Change from previous year (%)		-1.1%	13.3%	9.1%	-30%	2.5%	2.5%	2.5%	2.5%

Source: SunWater (2011al).

3.3 Water Use Forecasts

Introduction

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

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

For the Emerald Distribution System, SunWater assumed a water usage forecast of 80% of the WAEs in the channel system. Water usage for high and medium priority irrigation WAEs was not separately identified (SunWater, 2006b).

Stakeholder Submissions

SunWater

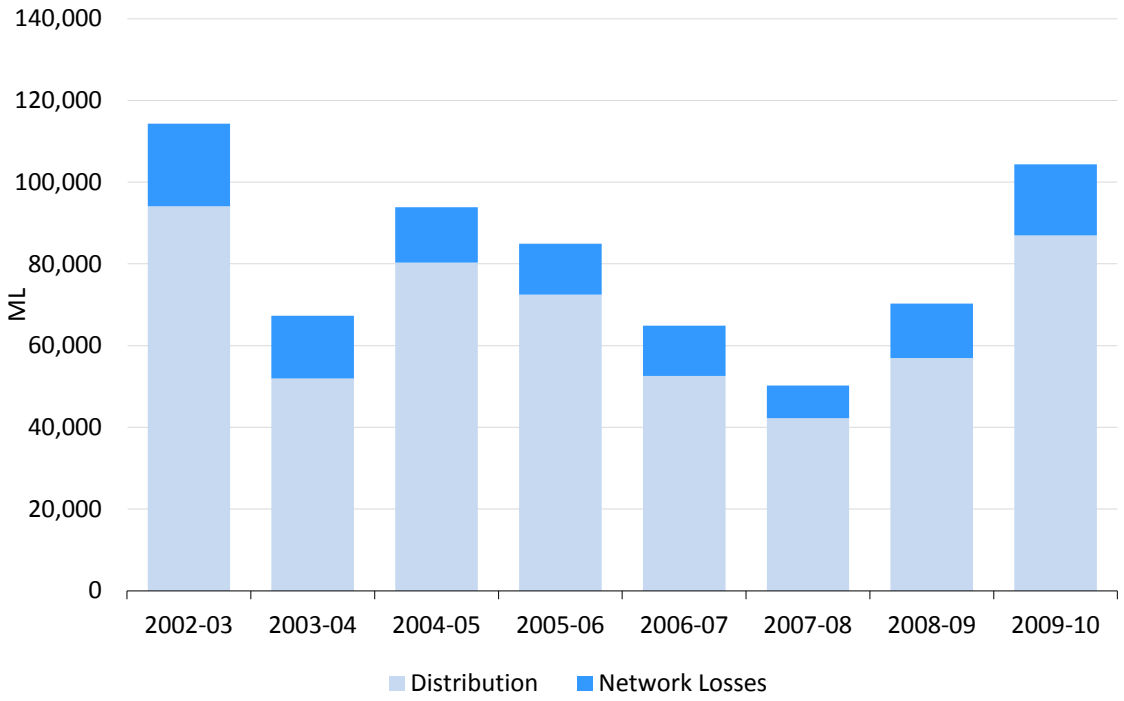
The available supply of water is determined by the announced allocations which are set according to rules contained in the ROP.

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

SunWater's usage forecast for 2012-17 are made with regard to historic averages over an eight-year period and the usage forecast applied for the current price path. The forecast use for the distribution system is 80% of current WAE and medium priority distribution losses, plus 100% of high priority losses.

Figure 3.1 shows the historic usage information for the Emerald Distribution System submitted by SunWater (2011). SunWater stated that over the past eight years, total water use in the distribution system has been 76% of current WAE.

Figure 3.1: Water Usage for the Emerald Distribution System



Source: SunWater (2011).

Other Stakeholders

Cotton Australia/QFF (2011b) submitted that projected water use is only being used to establish a bulk water cost for distribution losses and highlights the fact that this cost is nothing more than a stab in the dark.

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).

3.4 Tariff Groups

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

The previous SunWater Irrigation Price Paths Final Report (2006b) nominated two tariff groups for the channel systems of the Emerald Distribution System:

(a) Channel – Medium Priority; and

(b) Channel – High Priority.

SunWater proposed in its NSP to move to a single channel tariff group in the Emerald Distribution System when the bulk and distribution charges are unbundled.

In accordance with the Ministerial Direction, the Authority will adopt the proposed designated single tariff group. The allocation of costs between medium and high priority users is discussed further below.

3.5 Distribution Losses

Introduction

Distribution losses are incurred in the delivery of water to Emerald Distribution System customers. SunWater holds WAEs to account for losses involved in delivering water to customers in the distribution system.

In the previous price path, the costs of distribution losses were allocated to distribution users (SunWater, 2006a).

Stakeholder Submissions

SunWater

SunWater (2011w) submitted that distribution loss WAEs should be assigned bulk water costs (and water charges) due to the need to store these entitlements using headworks like any other types of WAEs. It also submitted that these costs should be recovered from customers of the distribution system (by including them in that system's revenue requirement) on the basis that they are needed to provide the distribution service.

The projected usage for distribution losses in the NSP are based on the assumption that 100% of high priority loss WAEs are used each year and that medium priority loss WAEs reflect the same usage percentage as other medium priority WAEs in the distribution system. Therefore, in the case of the Emerald Distribution System, high priority loss WAE is assumed to be 6,840 ML per annum and medium priority loss WAE is estimated at 77% of 29,330 ML or 22,490 ML per annum.

Other Stakeholders

Cotton Australia/QFF (2011a) submitted that if SunWater is going to recover bulk charges for distribution losses allocation, it would not have any incentive to reduce losses. It was not intended that losses allocation could be traded unless water savings have been proven within the sections that the losses were allocated. Cotton Australia/QFF further stated that these losses are then resold to users as drainage diversion charges (similar remarks were made in Round 2 consultation).

The Central Highland Cotton Growers and Irrigators Association (CHCGIA) (2010a) noted that there is a range of revenue streams received by SunWater that should be taken into account by the Authority, including (amongst others) distribution losses allocation sales.

Cotton Australia/QFF noted that where the costs of distribution losses are allocated to distribution customers, this increases their prices by more than if these costs are allocated to all users. They submitted that SunWater's NSP implied distribution losses of around $400,000 or 30% of the total operating cost (2011a, similar remarks were made in Round 2 consultation).

They further submitted that the allocation of these costs to distribution customers would increase distribution prices by 32%, whereas if these costs were spread over all customers the increase would be 23% and the bulk charge would increase by 15%.

Authority's Analysis

As noted in Volume 1, the Authority's general view is that distribution customers should pay for all distribution losses as identified in the distribution loss WAEs. Furthermore, that all distribution customers benefit from high priority losses, as these are released to fill the channel for all users and are not (solely) used to deliver high priority water.

In response to the specific issues raised by stakeholders:

(a) as the Authority has recommended that SunWater retain the revenues from the sale of additional (formerly loss WAEs), SunWater has an incentive to do so and thereby reduce the losses being paid for by distribution customers. Drainage diversion charges are dealt with separately below; and

(b) as discussed in more detail in Volume 1, the Authority does not consider that bulk customers should contribute to the costs of distribution losses. The water planning framework prescribes loss WAEs needed to deliver the distribution system service, and does not recognise any benefit or right to any excess loss WAEs to river customers.

The Authority's proposed treatment of distribution losses is consistent with that of the preceding 2006-11 price path. Therefore there is no particular increase in prices as a result of the approach adopted by the Authority in respect of distribution losses.

3.6 Drainage Charges and Drainage Diversion Charges

Introduction

Drainage charges apply in the Emerald Distribution System. SunWater provides the Emerald drainage system to remove water (farm run-off and storm water) from irrigation properties. Customers are required to discharge water from their farms through the drain inlet provided and they are charged for this facility.

Previous Review

In the previous review, drainage charges were calculated on a scheme basis. The Nogoa-Mackenzie WSS Tier 2 group decided that the drainage rate be retained (for channel irrigators) as a separate charge on the same basis as the 2005-06 drainage rate, based on hectares. For the 2006-11 price path, drainage charges for the Emerald Distribution System were set at $20.85 per hectare of irrigable land and $5.20 per hectare of non-irrigable land.

In relation to drainage diversion charges, in the Emerald Distribution System, there are no meters and accordingly customers pay a fixed charge per ML depending on the size of their installation (reflecting pump capacity). For the 2006-11 price path, the drainage diversion charge was set at $6.55 per ML of capacity per annum.

Stakeholder Submissions

SunWater

SunWater (2011d) proposed that the existing drainage tariff groups be retained, with Emerald Distribution System being one of the four distribution systems continuing to receive a separate drainage charge.

SunWater proposed to maintain the already established arrangements and charges, whereby revenues from drainage and drainage diversion charges are treated as a revenue offset against total costs for this service contract. Further, SunWater submitted that this arrangement should be reviewed at the end of the 2012-17 regulatory period, with a view to incorporating drainage costs into a combined fixed charge for the distribution system. SunWater's (2011d) submission on drainage charges is set out in more detail in the Volume 1 report.

Other Stakeholders

In April 2010, during Round 1 consultation as part of the current review, stakeholders said that drainage charges need to be reviewed as not all irrigators have or need drains, yet all are charged. Further, there is a need to take into account lesser use of drains in areas due to a number of factors (for example, trapping off-farm runoff) and to consider whether drainage works are justified now.

Similarly, CHCGIA (2010a) submitted that the current drainage charges do not reflect the massive changes in land use experienced over the last decade. These changes include a change in legislation that requires irrigators to install and use sediment traps, tail-water systems and infrastructure to limit all off-farm impacts. It was submitted that these changes have reduced SunWater's maintenance requirements and should be reflected in (lower) drainage charges, and a user-pays approach should be adopted at a scheme level to account for these changes.

Cotton Australia/QFF (2011a) noted that SunWater's NSP included drainage levies as a revenue offset and questioned whether this meant they were excluded from the Authority's pricing review. They also stated that in the last 15 years, irrigators have reduced the impacts and costs on the drainage system due to changes in cropping types and method and on farm infrastructure, and there has been no review of the costs associated with drainage over this period.

In April 2011, during Round 2 consultation as part of this review, stakeholders noted that some of the water lost in the distribution system goes into the drainage network and is then sold to customers who pay a drainage diversion charge. Irrigators argued that it is not equitable for irrigators to pay the bulk charge for distribution losses and then pay the drainage diversion charge when the same water is extracted from the drainage network.

A similar point was made by Cotton Australia/QFF (2011a) submitted that drainage diversion charges are charged for distribution losses water being recaptured by irrigators. They submitted that if irrigators are paying for distribution losses in their distribution charges, they are being asked to pay for the same water twice if they are charged for drainage diversion.

CHCGIA (2010a) also noted that SunWater recovers revenue from drainage diversion licences as well as drainage charges and the revenue streams from all sources should be taken into account.

Authority's Analysis

In Volume 1, the Authority recommended cost-reflective tariffs. Further, the Authority recognised that changes in farm practices have occurred such that some irrigators may not require drainage services to the same degree as previously.

SunWater advised the Authority that it does not separately identify drainage or drainage diversion costs within its accounts, and it would not be possible to generate renewals cost information for the planning period.

Without such cost information, the Authority is unable to recommend specific cost-reflective tariffs in this review.

In the circumstances, the Authority recommends that the current drainage and drainage diversion charges (including drainage diversion licences) be maintained in real terms and that all revenue collected be treated as revenue offset for distribution costs.

The Authority further recommends that SunWater collect detailed information on drainage (and drainage diversion) costs over the course of the 2012-17 regulatory period to inform cost-reflective charges prior to the next pricing review.

In response to comments made during the Round 1 consultation in April 2010, the Authority considers that the drainage network and the distribution system are both required to service customers. Therefore, it is appropriate that all customers contribute towards both costs.

In response to CHCGIA, the Authority recognises that the maintenance requirements of the drainage network may change over time.

In response to Cotton Australia/QFF, the revenue will be used to offset distribution costs, meaning a lower distribution system tariff.

In response stakeholder comments during Round 2 consultation in April 2011 and Cotton Australia/QFF, the Authority considers it appropriate that SunWater recover all costs associated with distribution losses and all costs associated with drainage diversion. It is appropriate that those benefitting from drainage diversion, be allocated their share of costs.

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. The Authority has interpreted this as 'service standards' because the term 'level of service' is defined in the *Water Act 2000* (Qld) as applying only where customers do not hold WAEs (as for urban water).

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 distribution system 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) an assessment of the efficiency (and prudency where not previously approved) of renewals expenditure incurred during the previous price path (i.e. 2006-11);

  (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 is therefore not practicable within the time available for the review, nor desirable given the potential costs involved, 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 35 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 Nogoa-Mackenzie WSS (including the Emerald Distribution System) was $480,000.

The Authority has accepted SunWater's unbundled opening ARR balance for Emerald Distribution System (excluding Nogoa-Mackenzie bulk) of $238,000.

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 path. The Authority has also sought to compare the original expenditure forecasts underlying the 2006-11 price path with actual expenditure, to establish the accuracy of SunWater's forecasts.

Submissions

SunWater

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

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

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

	2006-07	***2007-08***	***2008-09***	***2009-10***	***2010-11***
Past (Actual) Renewals Expenditure	192	211	808	1,878	776

Source: SunWater (2011).

Other Stakeholders

Cotton Australia (2010, 2011a) submitted that

(a) there was very little data to support the opening annuity balance of $466,000 (as at 1 July 2012);

(b) the separation of bulk and distribution renewals need to be reviewed; and

(c) the Authority's consultants have identified a 400% overspend of the budget for the last price path period. A review of the budgeted versus actual expenditure for the renewals items undertaken indicates that a number of items were not included within the original Board budget. Also, a number of items exceeded the original budget. Cotton Australia/QFF queried how the Board has or will respond to these over budget expenditures.

CHCGIA (2010a) that the only valid method of establishing efficient lower bound costs, including renewals annuity, is to examine locally managed water supply schemes in other States. Further, if accurate properly disaggregated cost data is not available from SunWater, the Authority has no option but to compare aggregated data with comparable schemes.

As part of the review of SunWater's asset management planning methodology and renewals expenditures, consultants reviewed a sample of Bills of Materials (BOM) and unit rates and also compared costs with those incurred by Pioneer Valley Water Board (PVWB).

Such a comparison with PVWB allows costs to be compared with another independently managed water supplier operating within a similar legislative framework. No suitable

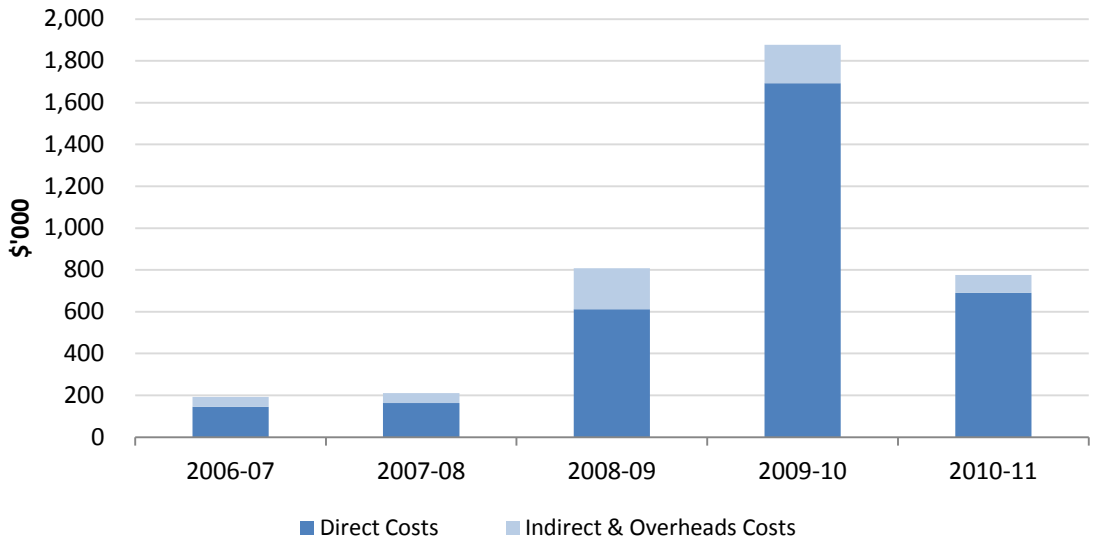
benchmarks were identifiable in other jurisdictions although some broad comparisons have been made in relation to particular categories of costs (overheads and indirect).

Authority's Analysis

Total Renewals Expenditure

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

Figure 4.1: Past Total Renewals Expenditure 2006-11 (Real $)



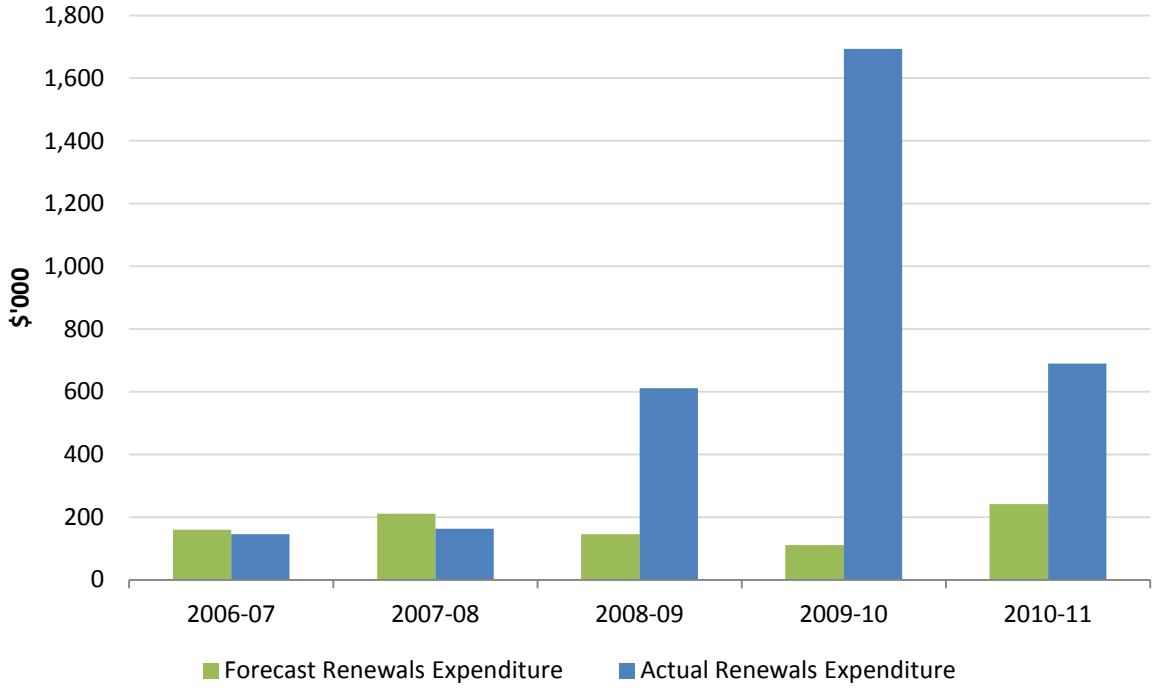
Source: SunWater (2011an).

Comparison of Forecast and Actual Costs

The Authority was able to source forecast direct renewals expenditure at a scheme level from Indec, who undertook the analysis for the 2005-06 review.

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

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



Source: Forecasts (Indec, 2011) and Actuals (SunWater, 2011k).

Actual direct renewals expenditure was approximately $2.5 million higher than the forecast over the period, which is partly attributable to unplanned expenditure on Intersafe projects of $1.13 million (direct costs).

Halcrow was appointed to review the efficiency (and prudency where not previously approved) of past renewals expenditure items. SKM was also appointed to provide an assessment of selected item(s).

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

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

(a) Intersafe Gated – this item was reviewed in detail (see below);

(b) Selma Drains De-silt – this item is reviewed in detail (see below);

(c) Weemah MC PE Lining at 31km – Channel lining using High Density Polyethylene (HDPE) lining is undertaken principally to minimise (eliminate) seepage losses and it is being installed in a number of similar jurisdictions. The item cost $252,842 in 2007-08. In the absence of details of the extent of lining or the size of the channel lined, Halcrow is unable to assess the efficiency of this spend;

(d) Selma MC - Refurbish berm[2] roads at a cost of $49,513 in 2007-08, below budget. This work involves regrading of berm roads to maintain condition under repeated traffic impacts of surface runoff. In the absence of quantities, efficiency of costs cannot be assessed;

(e) Repair LN3 Pump Unit – ($28,350 in 2008-09). SunWater noted that there was no Board budget as this expenditure related to an unplanned pump failure and actual costs were higher than expected when outsourced; and

(f) Install Fall Arrest Static Lines - Selma Pump Station Crane at a cost of $28,281 in 2008-09. Fall arrest lines are installed on steep ladders/stairs for workplace health and safety (WHS) compliance.

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

In the Emerald Distribution System, the analysis focused on one item, also raised in Round 2 consultations.

Item 1: Intersafe – Weemah and Selma Main Channels

SunWater

SunWater's past renewals expenditure in the Emerald Distribution System included that spent as part of SunWater's organisation-wide Intersafe program. Around $804,833 was spent in 2009-10 on the Weemah Main Channel, and $329,804 spent in 2009-10 on the Selma Main Channel. This expenditure related to the gated component of the Intersafe program.

Other Stakeholders

In Round 2 consultations, customers noted that SunWater engaged in significant unplanned expenditure on the Intersafe Program (SunWater's budget was $14.4 million state wide), and questioned whether this expenditure was peer reviewed.

Halcrow's Review

As noted in Volume 1, the Authority has accepted Halcrow's (2011) findings on the overall Intersafe Program (of $13.6 million) which found that:

(a) the expenditure was prudent on the basis that SunWater has a legal obligation to ensure the workplace health and safety of its employees;

(b) project costs represent market rates as SunWater sought competitive tenders and used contractors to deliver the projects; and

(c) the project was completed on time and within budget.

In the Emerald Distribution System, while Halcrow was unable to conduct a detailed assessment of efficiency, a high-level assessment indicated that costs were of the right magnitude.

SKM's Review

Similarly, SKM (2011) concluded that:

[2] Berm roads are channel banks built wide enough to be used as a road.

(a) SunWater's procedures were robust and, by developing standard infrastructure, implementation costs will have been reduced through economies of scale; and

(b) given the nature of the works, it was appropriate for SunWater to develop a program of works to implement the identified solutions as swiftly as reasonably possible; and

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

Authority's Analysis

The Authority accepts the recommendation of its consultants that expenditure on Intersafe was prudent and efficient.

Item 2: Selma Drains Desilting

Halcrow's Review

Halcrow noted that expenditure on de-silting drains was incurred in 2007-08 ($48,787), 2008-09 ($45,338), 2009-10 ($70,334) and was budgeted for in 2010-11 ($58,852). SunWater has noted that de-silting of the drains is undertaken to maintain channel capacity and thus mitigate the risk of flooding in Emerald.

Halcrow has not specifically reviewed past expenditure on de-silting. However, Halcrow has reviewed future expenditure (see below) and concluded that it is prudent and efficient.

Authority's Analysis

The Authority considers that, by inference, past expenditure on the same activity could reasonably be considered prudent and efficient on the basis of Halcrow's conclusions. Full details are provided in Section 4.5 below.

Conclusion

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

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

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

Item	*Date*	*SunWater*	*Authority's Findings*	*Recommended*
Sampled Items				
1. Intersafe Gated	2009-10	$1.1 million	Prudent and efficient	$1.1 million
2. Selma Drains De-silt	2007-08 2008-09 2009-10	$164,459	Prudent and efficient	$164,459
Non-Sampled Items				10% saving applied

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

4.4 Opening ARR Balance (at 1 July 2012)

SunWater indicated that the renewals opening ARR balance for 1 July 2011 was 350,000 for the Emerald Distribution System. This estimate reflects the most recent information provided by SunWater to the Authority in September 2011 and may differ from the NSP.

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 Emerald Distribution System is $395,000 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 for interest over the period consistent with the Authority's recommendations detailed in Volume 1.

To establish the closing ARR balance as at 30 June 2012 of 58,000, 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 items expected to occur over the Authority's recommended planning period (20 years), with a material renewals expenditure being defined as one which accounts for 5% 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 items expected to occur within the first five-years of each planning period.

Prudency and Efficiency of Forecast Renewals Expenditures

Stakeholder Submissions

SunWater

SunWater's proposed renewals expenditure for the Emerald Distribution Scheme is presented in Table 4.3 as provided in its NSP (submitted prior to the Government's announced interim prices for 2011-12). The major items incorporated in these estimates are:

(a) Selma drainage network – de-silting to maintain capacity at an estimated cost of $261,000 from 2011-12 to 2015-16. The need for these works was determined by risk assessment, with de-silting mitigating the risk of flooding in Emerald; and

(b) Selma Pump Station – replacing Logic and Control Equipment due to the age of the components and the unavailability of spares and vendor support, refurbishing pump and motors, and replacing three isolating cubicles at an estimated cost of $381,000 in 2011-12 and 2012-13.

There is no major dam safety upgrade expenditure forecast to occur within the five-year regulatory period. [Such expenditure is in any case to be excluded from the 2012-16 price path].

Table 4.3: Forecast Renewals Expenditures for 2011-16 (Real $'000)

Facility	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*
Selma Drainage	84	-	88	34	89
Selma Irrigation Distribution	1	-	38	-	2
Selma Lat S1_B Irrigation Distribution	-	-	13	-	-
Selma Lat S1_B Pump Station	-	-	-	15	17
Selma Lat S2_B Pump Station	-	-	-	3	9
Selma Pump Station	227	251	74	107	77
Selma S2_A Irrigation Distribution	-	-	-	3	-
Selma SCADA	22	-	25	37	-
Weemah Drainage	12	-	-	12	-
Weemah Irrigation Distribution	-	39	-	-	-
Total	**346**	**290**	**238**	**211**	**194**

Source: SunWater (2011)

The major expenditure items from 2016-17 are:

(a) replacement of sections of HDPE liner in Selma Irrigation System at an estimated cost of $1,659,000 in 2024-25;

(b) refurbishment of channels in Selma Irrigation System at an estimated cost of $4,785,000 in 2031-32; and

(c) replacement of pipeline in Selma Irrigation System at an estimated cost of $1,074,000 and gate control equipment Selma Irrigation System for $910,000 in 2033-34.

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

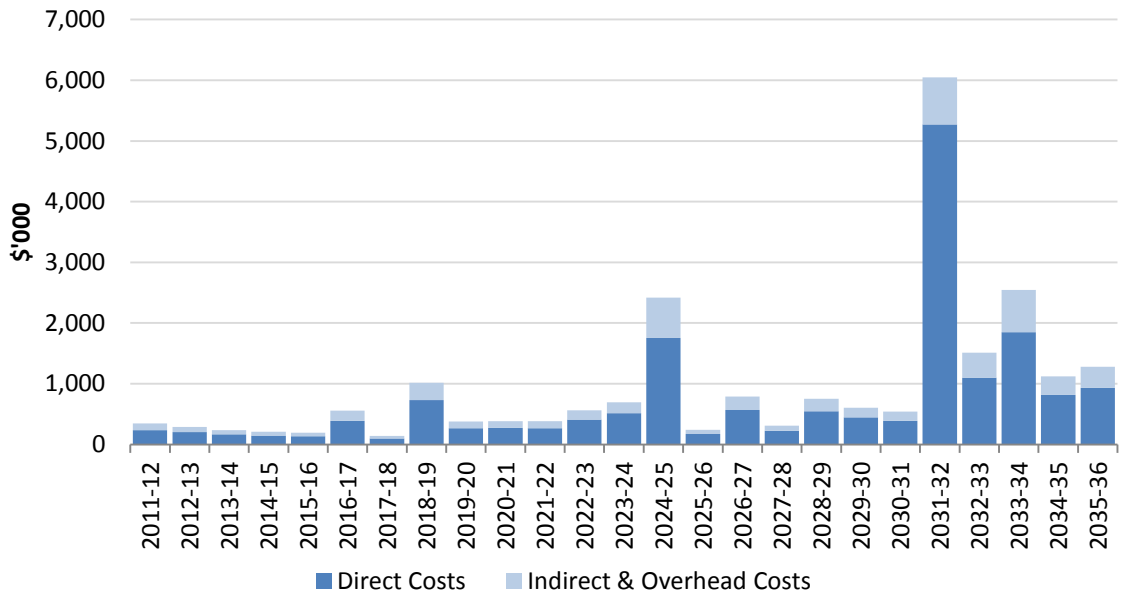
No other stakeholders have commented on this matter.

Authority's Analysis

Total Costs

SunWater's proposed renewals expenditure for 2011-36 for the Emerald Distribution Scheme is shown in Figure 4.4. This reflects the most recent renewals information provided by SunWater to the Authority in September 2011, and differs from the NSP. The Authority has identified the direct cost component of this expenditure, which is reviewed below. The indirect and overheads component of expenditure relating to these items are reviewed in Chapter 5.

Figure 4.3: Forecast Renewals Expenditure (2011-36)



Source: SunWater (2011am).

Item Reviews

As for past renewals expenditure, Halcrow and SKM have reviewed the prudency and efficiency of a sample of items.

Item 1: Refurbish Selma Drains - Desilt drains- new strategy – SEL

SunWater

SunWater's renewals program includes an allowance of $84,000 in 2011-12 for de-silting the Selma drains, and a continuing allowance to de-silt the drains every second year. The expenditure for each incidence is between $84,000 and $89,000, with total expenditure of $261,000 forecast for the period 2011-12 to 2015-16, and $1.123 million forecast for the period to 2011-12 to 2035-36.

Other Stakeholders

Cotton Australia/QFF (2011b) submitted that it is unclear why irrigators should be responsible for the costs of de-silting of the Selma drainage network to mitigate flood impacts for Emerald, and it is unclear why this is a renewals cost.

Halcrow's Analysis

Selma drainage assets have been in operation since 1973. An asset life has not been entered into the Systems, Applications and Products - Work Management System (SAP-WMS) system, and identifies that the remaining life of the asset is 118 years. However, there is also an additional refurbishment frequency scheduled at 19-year intervals, with the next occurrence in 2029-30 (this is a separate renewals item with forecast expenditure of $62,000).

During site inspections, SunWater operations staff indicated to Halcrow that refurbishment and de-silting of drains is a rolling program with prioritisation based on operator knowledge of the drainage system. It noted that the entire system would typically not be refurbished and de-silted every two years, but only parts of the system. This aligns with comments made by irrigators at a meeting held between SunWater, the Authority and the Emerald/Nogoa-Mackenzie irrigators who said that some drains have not been maintained for several years.

The most recent drainage condition assessment was undertaken in December 2000. Overall, this recorded significant deterioration with substantial refurbishment required to ensure ongoing operation.

Extracts from SAP-WMS indicated that refurbishment and maintenance planning of the 123.9km of drains within the Selma system is combined under the same functional location. Halcrow did not agree that a single condition assessment could be reflective of the entire drainage system.

In the Emerald NSP, SunWater has stated that the requirement for these works was determined by risk assessment, and that de-silting mitigates the risk of flooding in Emerald. Given that the majority of the drainage channels are located and discharge away from the town of Emerald, it is unclear how de-silting of channels mitigates flood risk for Emerald.

The extracts from SAP-WMS provided to this review indicate that a risk assessment has been undertaken to assess the risks from the failure of drainage earthworks. The risk assessment, undertaken in 2007, shows no risk against WHS, environment and financial categories. However, production/operations and stakeholder relations show a moderate consequence and pose a high risk to SunWater.

During the site inspection, SunWater operations staff presented examples of channels that have been recently refurbished and channels that would require refurbishment in the near future. SunWater commented that it has a program to incise low flow channels within the existing drains to help lessen ongoing maintenance requirements. Halcrow understood this occurs when drains are refurbished. However from the information provided to Halcrow, there does not appear to be a formal record of this in SAP-WMS. This could possibly explain the larger than average expenditure which occurred in 2009-10, as shown in Table 4.4 which summarises historical expenditure in the Selma Channel System for drain refurbishment.

Table 4.4: Emerald – Historical Expenditure on De-silting Selma Drains

Year	*Budget ($ 2010-11 real)*	*Yearly Total ($ 2010-11 real)*
2006-07	29,455	29,277
2007-08	69,492	54,232
2008-09	65,258	48,963
2009-10	72,472	72,472
Average		51,236
2*Average		102,472

Source: SunWater spreadsheet 2006-11 project.xls.

Over the past four years, average expenditure to de-silt Selma drainage has been approximately $51,236 per year (including indirects and overheads), or $102,472 every two years.

Halcrow noted that, of the $84,000 proposed in 2011-12, $60,000 is direct costs. Direct costs increase to $62,000 from 2015-16 forwards.

On the basis of the information available to this review, Halcrow was satisfied that forecast (direct) expenditure on refurbishment and de-silting of the Selma drainage system is prudent and efficient. Should the low-flow channels lead to improved refurbishment serviceability, then expenditure to service the channels should be adjusted in the future.

Given there is a single functional location for the entire Selma drainage system, it would be difficult to report a single condition assessment representative of the condition of all drainage. Halcrow recommended that SAP-WMS be used more extensively as the basis for planning. For example, channels could be split up on the basis of reaches, and condition assessments prepared on the basis of reaches to allow more accurate refurbishment planning.

Halcrow also noted that some farmers have opted to utilise SunWater drainage assets to capture tail water on their properties. SunWater contends that using drains for temporary storage of water prior to reuse, results in more silt deposition.

Authority's Analysis

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

In relation to Cotton Australia's comment, the cost of activities to manage flood risk is part of the cost of providing distribution services (rather than for the town of Emerald). It is anticipated that desilting would also improve the efficiency of the channel system providing benefits for irrigators.

Under SunWater's renewals approach, maintenance items that occur less frequently than every year are considered to be major periodic maintenance eligible to be funded through a renewals annuity. The Authority accepts this approach in the current framework.

Item 2: Selma Distribution - Replace Control Equipment

SunWater

SunWater's renewals program includes expenditure to replace control equipment in 2018-19 ($357,000) and 2019-20 ($35,000), and again in 2033-34 ($353,000) and 2034-35 ($35,000).

Extracts of SAP-WMS provided to Halcrow indicated that the control equipment refers to the Selma meters, control structure, Parshall flume and regulating gate. Items that make up control equipment include antennas, cabling, enclosures, radio, remote telephony units, sensors, transmitters, solar panels, batteries, battery chargers and controllers. Control equipment forms part of the Total Channel Control System.

Extracts from SAP-WMS indicated that the control equipment in the Selma channel has been in operation since 2004. SAP-WMS indicated that the control equipment has a 15-year life which is consistent with SunWater's Asset Hierarchy Development Manual, which lists the estimated life of metering equipment to be 15 years.

SunWater's condition assessment manual recommends a maximum assessment frequency for controls and Supervisory Control and Data Acquisition (SCADA), which includes control panels of two years.

Other Stakeholders

No other stakeholders have commented on this item.

Halcrow's Analysis

The replacement interval of 15 years is consistent with replacement intervals for other control equipment. On this basis, replacement every 15 years is considered prudent. Based on the information provided, Halcrow also considered the expenditure to be efficient.

Authority's Analysis

The Authority accepts Halcrow's recommendation that this expenditure is prudent and efficient.

Item 3: Selma Pump Station LIW/6 Replace Logic and Control

SunWater

The Selma pump station is located on the left embankment of the Fairbairn Dam. It has three variable discharge pumps with a capacity in excess of 800ML/day. This renewals item is the replacement of logic and control system that controls the three Selma pumps, planned for 2012-13 at $197,000 (direct cost of $137,000) and again for 2027-28 at $195,000 (direct cost $142,000). The total cost is $392,000.

Halcrow's Analysis

Halcrow noted that that the asset life entered into the SAP-WMS system for the logic and control system at Selma pump station is 15 years. This is five years more than the estimated asset life in SunWater's SAP Asset Management Guide, which is 10 years, but is broadly consistent with control system asset life adopted elsewhere.

The most recent condition assessment of the logic and control at Selma pump station was undertaken in 2000. At this time, the logic and control unit was recorded as being in perfect as new condition. SunWater's condition assessment manual recommends the maximum assessment frequency for controls and SCADA (which includes Programmable Logic Controller

- PLC) to be two years, which indicates that a revised condition assessment is long overdue. It is recommended that condition assessments are undertaken at the frequency recommended in SunWater's electrical asset guide.

The risk assessment in SunWater's SAP-WMS system undertaken in October 2005 indicates that failure of the logic and control system would have moderate consequences for WHS, insignificant consequences for the environment and minor consequences for financial, production/operations and stakeholder relations. Each consequence, however, resulted in a low risk with a comment entered into the SAP-WMS system stating that failure would result in loss of short term delivery capacity.

Halcrow indicated that in 2009, Parsons Brinkerhoff (PB) undertook an audit of approximately 20% of SunWater's water infrastructure electrical switchboards. Whilst the Selma pump station logic and control unit was not audited, PB found that all PLC's audited were approximately 11 years old and were in good condition. Of the five PLCs PB reviewed, none was recommended for replacement at that time.

Halcrow noted that expenditure to ensure appropriate logic and control of major pump stations is prudent. However, given that a condition assessment has not been recently undertaken, and logic and control boards located at other facilities were found to be approximately 11 years old and in good condition, it is difficult to confirm that expenditure to replace the logic and control unit at Selma pump station in 2012-13 is required.

Halcrow therefore suggested that the expenditures should be deferred by five years, to 2017-18 and 2032-33 respectively.

Authority's Analysis

The Authority accepts Halcrow's conclusion that the item is prudent, but could be deferred by five years. It is noted that deferral would not have a significant impact on the estimated renewals annuity.

Item 4: Selma Pump Station - LIW/7 Refurbish pump No.2

SunWater

The refurbishment of Selma pump station is planned for 2014-15, at a cost of $53,000 ($37,000 direct costs) and every five years thereafter.

Other Stakeholders

Cotton Australia/QFF (2011b) submitted that expenditure of $736,000 is forecast for Selma Pump Station over five years on pumps that are 30 years old and will remain so after repairs are completed and there is no data to support the expenditure.

Halcrow's Analysis

The description entered into SAP-WMS for the renewals item is 'Refurbish Pump - Selma Pstn Pun2 - bearings, bushes, sleeves'. Pump No. 2 is one of three pumps located within the Selma pump station. Pump No.2 has been in operation since 1974 and an asset life of 50 years has been entered into the SAP-WMS system. The estimated asset life for large pumps is listed in SunWater's Asset Hierarchy Guide as 60 years. The estimated replacement cost of the pump is $229,317 ($2007-08). SAP-WMS indicates that the pump is scheduled to be refurbished every five years.

A review of SunWater's historical renewals expenditure indicates that the most recent refurbishment (code 10ELA18) occurred in 2009-10 at a cost of $55,321 ($2009-10). A second entry in the historical renewals for 2009-10, (code 10EIA25 'Refurbish Motor - Selma Pstn Pun2 - Varnish, bake & bearings') indicates expenditure of $18,317 (versus a budget of $25,470 ($2009-10). It is also noted that a separate entry has been recorded in SAP-WMS to refurbish the Selma pump No. 2 in 2010-11 with projected expenditure of $65,475. It is understood that this refurbishment is expected to be a 'one-off' refurbishment as the frequency of occurrence entered into SAP-WMS is 500 years.

Over the most recent five-year period, and including budgeted expenditure in 2010-11, a total of approximately $146,000 was spent to refurbish pump No.2. This is equivalent to approximately 64% of the asset replacement. Halcrow noted that it may be worthwhile performing a detailed investigation of the remaining life of the pump to assess whether a replacement pump would lead to more efficient expenditure over the longer term.

The most recent condition assessment of the pump was undertaken in March 2010, at which time it was recorded that the pump exhibited moderate deterioration with minor refurbishment required to ensure ongoing reliable operations.

Based on the available information, Halcrow recommended that a whole-of-life assessment is made of pump No.2 to determine the benefits of the refurbishment versus replacement. However, Halcrow recommended that the investment is prudent and efficient.

Authority's Analysis

The Authority notes that Cotton Australia's concern relates to total expenditure on a number of items relating to the Selma pump station, including the control system in Item 5. Halcrow noted that a whole-of-life assessment may be appropriate to determine the most cost-effective approach to refurbishing the pump station. However, five-yearly refurbishments are likely to be cheaper than five-yearly full pump replacements.

The Authority therefore accepts SunWater's proposed expenditure to be prudent and efficient.

Item 5 – Selma Distribution - Replace High-Density Polyethylene Synthetic Liner

SunWater

SunWater's NSP identified renewals expenditure to replace the HDPE liner of $1.659 million.

Other Stakeholders

Cotton Australia/QFF (2011b) submitted that the forecast replacement of HDPE liner in the Selma channel of $1,659,000 is problematic. They submitted that changes to infrastructure which enable allocation to be sold should see any funds over and above the cost of the item going back into the scheme ensuring water users do not carry the ongoing cost of maintaining it.

A similar point was made by stakeholders in Round 2 consultation in April 2011. They queried whether the replacement of the lining should be paid from renewals or from proceeds of the initial sale.

Halcrow's Analysis

Halcrow identified two renewals items are planned for 2024-25 that involve replacing the HDPE synthetic channel liner between chainage 31,309m and chainage 34,225m and between chainage 34,225m and chainage 36,411m on the Selma Main Channel. The combined length of liner to be replaced is 5,102 metres, at a total cost of $1.109 million (direct cost of $804,000).

Halcrow estimated the direct cost for replacement as $158 per metre of channel (average over the two sections). Based on site inspections it is understood that the HDPE channel lining is 2 mm thick.

The HDPE synthetic liner has been in operation since August 2005. Halcrow noted that the asset life entered into the SAP-WMS system is 20 years which aligns with the estimated life in SunWater's guide. During site inspections, SunWater indicated that it has had positive experience with similar HDPE liner in the Mareeba Channel (in the Mareeba-Dimbulah Water Supply Scheme), which has now been in operation for 15 years and is expected to last at least 20 years. SunWater noted that it would re-estimate the life of the liner should the integrity of the Mareeba liner continue to be maintained.

Halcrow noted that, from the SAP-WMS extracts provided to this review, it does not appear that a condition assessment or risk assessment has been undertaken of the Selma liner. Halcrow noted that SunWater's users manual recommends a maximum assessment frequency of five years. Halcrow understands that the channel lining program is determined via permeability and hydraulic testing. The driver for channel lining is to prevent seepage.

Based on the information reviewed, Halcrow considered the replacement of the HDPE liner in 2024-25 to be prudent and efficient.

Authority's Analysis

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

In general, to provide SunWater with the necessary incentive to develop opportunities for greater provision of services and efficiencies, the Authority has concluded (see Volume 1, Chapter 3) that SunWater should receive revenue from the sale of new WAEs. Where subsequent maintenance and refurbishment of that asset is required it is a legitimate cost to be met through a renewals annuity. Such an approach allocates the costs to those benefitting from future benefits from that liner.

The Authority has not considered whether past sales of allocations in this scheme are capital contributions, as this would only affect the value of the regulated asset base. Under the Ministerial Direction, the Authority is not to consider the regulated asset base (RAB) for existing irrigation assets (that is assets commissioned prior to 1 October 2011). Therefore the Authority has not considered the existing regulatory asset base or issues connected with its value including past sales of allocations.

Item 6 - Selma Channel Lining Replacement – 2032

SunWater

The annuity item is for the replacement of the concrete lining of the Selma Main Channel in 2031-32 at a projected cost of $4,785,000 (SunWater NSP).

SunWater advised that the asset was constructed in 1981 as part of the original construction of the distribution system.

Other Stakeholders

In relation to SunWater's cost estimates, Cotton Australia/QFF (2011b) stated:

(a) the Selma channel attracts over 95% of the renewals spend compared to Weemah; and

(b) the $4,785,000 forecast to refurbish channels in Selma should exclude costs incurred by the channel automation trial. They stated that replacing the concrete lining will never happen again on black soil, but this is still a major part of this renewals spend.

Halcrow's Analysis

Halcrow cited a direct cost of $4,279,000 for this project. Halcrow observed that the channel lining replacement is located between chainage 25,237m and chainage 26,917m, a total length of 1,680m. Based on direct costs, this equates to a replacement cost (direct) of $2,547 per metre.

Halcrow found that extracts from SAP-WMS indicate that the concrete lining in the channel has been in operation since 1981, with an asset life of 80 years. The estimated replacement date for the lining is 2060-61. Halcrow noted that the asset life entered into SAP WMS is at variance with estimated life for channels with concrete lining of 50 years provided in SunWater's Asset Hierarchy Development Guide. The replacement frequency entered into SAP is for every 70 years, while the first replacement is scheduled for 2031-32, which is consistent with 50 year asset life.

Halcrow concluded that given lining of channels with HDPE has recently achieved positive results elsewhere in the Selma Irrigation Channel and lining cost is in the order of $158-165 per metre of channel (varies depending upon channel profile), expenditure to replace existing concrete lining with new concrete lining in 2031-32 is not considered prudent or efficient.

Preparation for the initial installation of a HDPE lining, which would include shaping of the channel profile and the supply and placement of sand bedding, would add additional cost (compared to replacement). Halcrow stated that an all inclusive installation cost of $330 per metre (direct cost) would result in an installation cost of $555,000 (direct).

SKM's Analysis

SKM sourced further information from SAP-WMS that indicated a total cost of $4,435,424 for the relining expenditure. The lower total cost (as compared to the NSP) is because the SAP estimate includes a notional amount for the indirect and overhead cost uplift, whereas the NSP is based on SunWater's financial model which provides an allocation taking into account state-wide allocation of indirect and overhead costs.

SKM advised that for the standard object type (asset type) for this infrastructure, concrete lined irrigation channel, (CHCONCL), SunWater has allocated a standard run to failure asset life of 80 years and a refurbishment period of 20 years. SKM considered both the run to failure asset life and refurbishment period to be appropriate for this asset type.

(a) Available Information

SKM accessed SunWater's SAP-WMS, and asset condition and risk assessment policy and procedures and drew on the following information.

Table 4.5: Documents Reviewed Specific to the Selma Channel Lining Replacement

Document No.	*Document Name*	*Document Title*	*Date*
1107592	1107592 v1 Selma MC Concrete Lining Replacement 2032	Emerald Irrigation Area – Selma Main Channel – Concrete Lining Replacement	8 August 2011

(b) Prudency Review

Asset Replacement/Refurbishment Date Determination

SKM noted that SunWater has applied its risk evaluation method to this asset and determined that it has a financial risk criterion with a moderate consequence rating (score 18). This, together with a probability (likelihood of occurrence) score of 3 results in an overall risk score of 54 which placed this asset in a medium risk category. Under SunWater's asset management method, for this asset type, an overall risk category of Medium reduces the run to failure asset life from 80 years to 70 years and the refurbishment period from 20 years to 18 years.

SKM noted that there is no commentary on SunWater's SAP-WMS as to why a financial risk consequence score of 18 has been applied. However, since this is a major piece of SunWater's infrastructure, SKM considered it is reasonable to argue that a failure of the asset would have appreciable financial consequences to SunWater. SKM therefore considered the risk related run to failure asset life adjustment to be reasonable.

The last condition assessment, as recorded in WMS for this asset, was undertaken in 2000. The high level score, recorded in SAP-WMS, was a 3 (Moderate deterioration with minor refurbishment required to ensure ongoing reliable operation). The WMS stipulates that a condition assessment for this asset type should be conducted at a maximum of 10-year intervals. This implies that the asset condition assessment was due in 2010.

SKM noted that while the last condition assessment was relevant at the time the NSP was prepared, the time had all but elapsed. SKM considered this brings into doubt the validity of the 2000 condition assessment in terms of it being representative of the current condition of the asset and hence its usefulness in triggering any adjustment to the standard run to failure asset life.

SKM also noted that the 2000 condition assessment recorded in SAP-WMS was a conversion. As such, there is no data that underpins and provides a reason for a score of 3 and there is no way of assessing which of the four condition criteria for this asset (concrete surface, foundation earthworks, joints or water loss) triggered the score of 3.

Applying a score of 3 in 2000 reduces the run to failure asset life by 26 years over the risk adjusted standard run to failure asset life. Had the score been a 2 (the next available lowest score), then, under SunWater's systems, the risk adjusted asset life would have been extended by 25 years. This represents a potential 51 years difference in asset life between a score of 2 and 3 for a high level condition assessment conducted 10 years ago. Given the relatively coarse adjustment to asset life that a condition assessment can have, SKM recommended that for significant assets such as the Selma Main Chanel, a condition assessment is undertaken not more than five years prior to a price reset.

Given that the latest condition assessment was conducted some 10 years ago and was of a high level that does not identify the reason for the lower than expected score, SKM considered that the prudency of this annuity item (replacement) cannot be determined until such time that a further asset condition assessment has been undertaken.

Options Evaluation

SunWater has included a preliminary options evaluation. The preliminary options evaluation investigated two options:

(a) replacing like for like, and

(b) installing an HDPE Liner.

The preferred SunWater replacement option is replacing "like for like" in accordance with SunWater's method for determining replacement costs for annuity asset items which are to be replaced more than five years from the current planning date.

The information supplied in the SunWater report specified above highlights the technical and financial challenges of installing an HDPE liner. It is difficult to establish the impact of each of the challenges at the preliminary options stage. SKM therefore considered the options investigated reasonable and in keeping with good industry practice, given the timing of the replacement (2031-32).

However, on a discounted cashflow analysis basis, the HDPE liner option was found by SKM to be cheaper than the like for like option of using concrete. As such, SKM considered that the cost of a modern equivalent option of use of an HDPE, rather than concrete, should be used for the renewals annuity, unless and until it is demonstrated that HDPE is not a viable option.

Timing of Renewal/Refurbishment

Applying SunWater's risk and condition based method for determining run to failure asset life and hence projecting asset replacement timing, a risk score of Medium, reduces the run to failure asset life of this type of asset from 80 to 70 years. Assuming that the asset condition decay was in accordance with the standard condition decay curve, this would put the replacement date at 2050-51.

SunWater assessed the condition of the asset in 2000 as rating a condition score of 3. This indicated that the asset had deteriorated more rapidly than the standard asset condition decay curve would predict to that point. Realigning the risk adjusted asset decay curve to pass through this premature condition rating of 3 results in a projected run to failure life (under SunWater's method) of 2024-25.

However, the SunWater WMS indicates that the replacement date is to be brought forward to 2031-32 (not 2024-25 as SunWater's method would dictate). SKM stated that it is not clear why SunWater has adopted a replacement date of 2031-32 given that this is not consistent with SunWater's processes. Given that the annuity item value is discounted to present value terms to develop the total annuity value, this seven year difference in timing is not considered to be material given that both dates fall within this annuity value assessment period. Nevertheless, the impact of the shift of the asset condition decay curve, based on the 2000 condition assessment is that the asset needs replacement after only 44 years instead of the expected 70 years, a reduction of 26 years on the risk reduced standard run to failure asset life.

Given that the condition rating is based on a high level assessment that was conducted at least 10 years ago, the condition rating, and particularly its use in bringing forward the replacement date for the asset was questioned by SKM. SKM therefore did not consider the timing of this replacement to be justified and hence considered it not to be prudent.

Conclusion on Prudency Evaluation

SKM considered that SunWater's policies for adjusting replacement periods and assessing asset condition has not been followed, and that the reliance on a high level, 10-year old condition assessment for determining asset replacement date, is not in keeping with good industry practice for a major asset of this type. SKM therefore concluded that the need for replacement of this annuity asset has not been demonstrated and the inclusion is not prudent.

(c) Efficiency Evaluation

For major works such as the replacement of the main channel concrete lining, SunWater's planning team applies a unit rate against bill of materials quantities for the asset in question. Given the volume of annuity items that SunWater's Planning Team are engaged with at any point in time, this approach was considered reasonable and in accordance with good industry practice.

Renewal/Replacement Item Cost Evaluation

The preliminary options investigation includes a cost estimate for two options, like for like replacement and HDPE liner (modern equivalent replacement). SKM compared the cost of both options on both a Total Cost basis (i.e. summed present and future costs) and on a Present Value (PV) cost basis (where future costs are discounted to current day costs recognising the time dependent value of money).

The PV and Total Cost for both options were calculated for two cases: Case 1 made use of a standard 80-year asset life period and Case 2 made use of 44-year life basis. The reason for investigating a 44-year period is that in replacing like for like it is reasonable to expect the same life span as for the original on the assumption that the accelerated decline in asset condition would not be rectified by a replacement of the lining e.g. it is related to fundamental issues such as ground movement. The summary of the values is given in the table below.

Table 4.6: Comparison of PV and Total Costs for 'Like for Like' and HDPE Options ($2010)

Option	*44 Years*		*80 Years*	
	PV ($)	*Total Cost*	*PV ($)*	*Total Cost*
Like for Like (Concrete Lining)	4,476,631	4,587,424	4,477,768	4,717,424
HDPE Liner	2,595,842	5,121,314	2,613,571	7,161,803
% Difference	-42%	+12%	-42%	+52%

Source: Halcrow (2011).

The PV sums are in 2009-10 dollar terms and represent lifecycle costs (which include both capital and operating expenditure) from the replacement date of 2031-32 to the end of life of a replacement concrete channel discounted back to 2031-32.

The HDPE Liner option is estimated to cost some $2 million to install in 2031-32 (2009-10 $ terms), thereafter, it needs to be replaced every 20 years at a cost of approximately $890,000. Hence, the HDPE needs to be replaced three times during an 80-year life (ignoring the replacement at the end of 80 years) and twice during a 44-year life assumption.

Whilst on an absolute cost basis, the like for like replacement represents a cheaper option, on a present value basis, the HDPE option is some 42% cheaper, on both a 44-year and 80-year life assessment.

On the basis of the above analysis, the HDPE option is considered to be the most efficient replacement option, even though it would be replaced more frequently than concrete.

(d) Summary and Conclusions

SKM was not satisfied that SunWater's robust procedures for determining the timing of refurbishment of an annuity item have been followed.

Hence, SKM considered that the timing and need for replacement of this annuity item is not prudent. In particular, the timing of the replacement is driven by a high level condition assessment conducted 10 years ago. This has a significant impact under SunWater's systems on the timing of asset replacement. SKM recommended that an additional condition assessment is undertaken to determine whether it is appropriate to include the cost of this asset replacement in this current annuity value determination. In absence of this, SKM recommended a replacement value should not be included in the current annuity valuation.

SKM recognised that, in line with SunWater's Asset Refurbishment Planning Guideline a detailed options investigation will not be conducted until between one and five years prior to the replacement work being undertaken. Hence at this stage of the timing of asset replacement, SunWater adopts an automatic 'like for like' replacement assumptions and determines the value of that annuity item replacement by escalating as-installed costs. However, given that the replacement value for this annuity item is significant (in excess of $4 million), SKM considered that it is appropriate to undertake a high level option analysis. From this analysis, SKM considered that the cost of a like for like replacement is not efficient.

Authority's Analysis

The Authority notes the concurrence between Halcrow and SKM in regard to the preference for a modern equivalent replacement option (HDPE liner) for the Selma channel lining replacement. Both consultants consider that the concrete relining option is not efficient.

However, the Authority notes that both consultants also identified the timing of replacement of the lining as an issue, being much earlier than the expected 70-year life. Given that the proposed timing was based on a 2000 condition assessment, the Authority sees merit in SKM's proposal that an additional condition assessment should be undertaken to determine whether a replacement is required within the planning period. Until this is completed, a replacement value should not be included in the current annuity valuation.

In relation to issues raised by Cotton Australia, the emphasis on Selma Distribution Channel reflects the circumstances of the scheme. Channel relining was undertaken in the Weemah channel in the previous regulatory period. While there may be scope to segment the scheme into two separate tariffs, this is not permissible under the current tariff groupings.

The cost of the channel re-lining as analysed by SKM did not include any costs associated with channel automation.

The analysis by Halcrow and SKM support Cotton Australia's view that concrete lining would not be replaced. The consultant's cost estimates also do not include any provision for an automation trial.

Conclusion

In summary, six items for the Emerald Distribution System were sampled. Of these:

(a) five items are prudent and efficient and have been retained as forecast expenditure; and

(b) one item is not prudent and has been removed from forecast expenditure.

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

In total, the Authority recommends the direct renewals expenditure be adjusted as shown in Table 4.7.

Table 4.7: Review of Forecast (Direct) Renewals Expenditure 2011-36 ($'000)

Item	*Year*	*SunWater ($)*	*Authority's Findings*	*Recommended ($) Per Item*
Sampled Items				
1. Selma Drainage - desilting	2011-12 2-yearly	60 (each desilting)	Prudent and efficient	60
2. Selma pump station – logic and control	2012-13, 2027-28	137,137	Prudent and efficient, but defer 5 years	137,137
3. Selma Distribution – replace control equipment	2019-20, 2034-35	256,256	Prudent and efficient	256,256
4. Selma pump station – refurbish pump 2	2014-15 5-yearly	37 (each refurb)	Prudent and efficient	37
5. Selma Distribution replace Hdpe liner (2 sites)	2024-25	483,322	Prudent and efficient	483,322
6. Selma Distribution – concrete lining	2031-32	4,279	Not prudent	0
Non-Sampled Items				10% saving applied.

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

4.6 SunWater's Consultation with Customers

Submissions

SunWater

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

(a) able to offer suggestions on planned asset maintenance which are considered by SunWater in the context of asset management planning;

(b) consulted on various operational and other aspects of service provision, including the timing of shutdowns and managing supply interruptions; and

(c) provided with information about renewals expenditure, particularly where supply interruptions may result.

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

Other Stakeholders

No other stakeholders have commented on this matter.

Authority's Analysis

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

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

4.7 Allocation of Distribution Renewals Costs According to WAE Priority

Previous Review

For 2006-11 price path, the renewals costs for the Emerald Distribution System were apportioned between priority groups using converted nominal water allocations. The conversion to medium priority WAEs was determined by a pricing conversion factor (2.5:1), that is, one ML of high priority WAEs was considered equivalent to 2.5 ML of medium priority WAEs.

Stakeholder Submissions

SunWater

SunWater (2011i) submitted that the allocation of the renewals annuity is a matter for tariff setting by the Authority, but that the Headworks Utilisation Factor (HUF) methodology should not be used because the HUF is not relevant to the allocation of fixed renewals costs in distribution systems which do not provide storage.

In determining a basis for allocating fixed distribution system costs to customers in general (rather than specifically between customer priority groups), SunWater submitted that current WAEs should be adopted. SunWater stated that current WAEs represent the best available means of determining customers' current share of distribution system capacity.

Other Stakeholders

CHCGIA (2010b) noted particular concerns relating to high priority charges within the Weemah Channel. They stated that in the past, high priority charges were 2.5 times medium priority charges, on the basis that 2.5 times the infrastructure headworks was required to capture and store a megalitre of high priority water, compared to medium priority water. They noted that

high priority water is currently charged at 2.5 times the medium priority charge in both bulk and distribution segments of the scheme.

They submitted that as the channel system is used to deliver water and not for its capture and storage, the factor of 2.5:1 should not apply and is at odds with the original intent of this factor. They submitted that the 2.5:1 factor could only be correctly applied to bulk charges.

They submitted that distribution charges could be calculated by extracting the bulk component and ensuring the 2.5:1 factor is applied to the bulk component only. They provided a worked example using 2009-10 charges of $19.64 for medium priority distribution water and $5.72/ML for medium priority river water. Using these inputs they proposed that medium priority distribution water (excluding the bulk component) is 19.64 – 5.72 = $13.92/ML. They then submitted that high priority distribution water (including the bulk component) should be priced at 13.92 + (5.72 x 2.5) = $28.22. [This is well below the 2009-10 price of 49.12/ML.]

Cotton Australia/QFF submitted that if medium priority water is converted to high priority water some schemes will lose 50% of the income generated by medium priority users, and questioned how is this to be recovered as the proposed price difference between medium and high priority is as low as 5% when the storage requirement is as large as 300%.

Authority's Analysis

As noted in Volume 1, the Authority considers that distribution system costs should be allocated according to the relevant cost drivers. The Authority does not consider the HUF methodology to be an appropriate cost driver for distribution system costs.

In principle, the Authority considers that distribution system capacity is the relevant cost driver for fixed renewals expenditure. In general, the best measure of capacity share is the instantaneous or peak flow rate. However, neither DERM's regulatory framework nor SunWater's contracts currently specify a peak flow rate or share of system capacity.

As discussed in Volume 1, the Authority recommends that nominal WAEs be used for the allocation of fixed distribution system costs between priority groups. That is, on the basis of current WAEs held, irrespective of priority type, with no conversion. Under this approach, high and medium priority WAE are allocated the same costs per ML. This reflects the view that medium and high priority users have the same share of distribution system capacity per ML of nominal WAEs, as recognised by some customers (including CHCGIA) and as submitted by SunWater.

The Authority also recommends that, at the conclusion of this review, SunWater commence a review of a more appropriate means for allocating fixed renewals costs in distribution systems.

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 Emerald Distribution System, the recommended renewals annuity for the 2012-17 regulatory period is shown in Table 4.8. 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 2012-16. SunWater did not submit a disaggregation between high and medium priority customers.

Table 4.8: Emerald Distribution System 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	456	280	303	360	338	400	495	511	544	553	553
Total Authority	-	-	-	-	-	-	623	645	689	696	706
High Priority	-	-	-	-	-	-	8	9	9	9	9
Medium Priority	-	-	-	-	-	-	615	637	680	687	697

Note: Includes indirect and overhead costs relating to renewals expenditure, which is discussed in Chapter 5.
Source: Actuals (SunWater, 2011) and Recommended (QCA, 2011).

5. OPERATING COSTS

5.1 Background

Ministerial Direction

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

Issues

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

(a) the scope of operating activities for the Emerald Distribution System;

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

(c) the prudency and efficiency of SunWater's proposed operating expenditures including direct and non-direct costs and escalation factors; and

(d) the most appropriate methodologies for assigning operating costs to service contracts 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[3] (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 its operating activities for this system to include service provision, compliance, insurance, recreation and other supporting activities (these were not classified by direct and indirect costs).

[3] 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.

SunWater noted that:

(a) a Service Manager and 11 staff are located at the Emerald depot and are responsible for the day-to-day water supply management and for delivery of the programmed works for all users in the region;

(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 – water accounting and managing and reporting to DERM on the distribution loss WAE;

  (ii) 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, contamination and the discharge of water from channels and drains into the environment; and

  (iii) 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; and

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

Previous Review

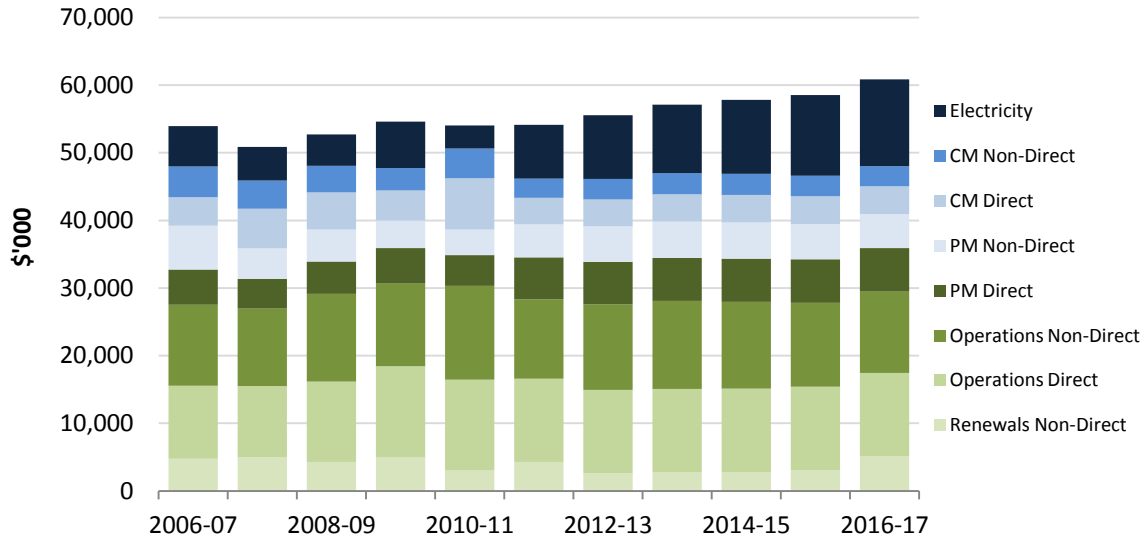
For the 2006-11 price paths, Indec identified annual cost savings of between $3.8 million and $5.5 million (2010-11 dollars) or 7.5% to 9.9% of total annual costs, which SunWater was to achieve during the 2006-11 price paths (SunWater, 2006a). See Volume 1.

Stakeholder Submissions

SunWater

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

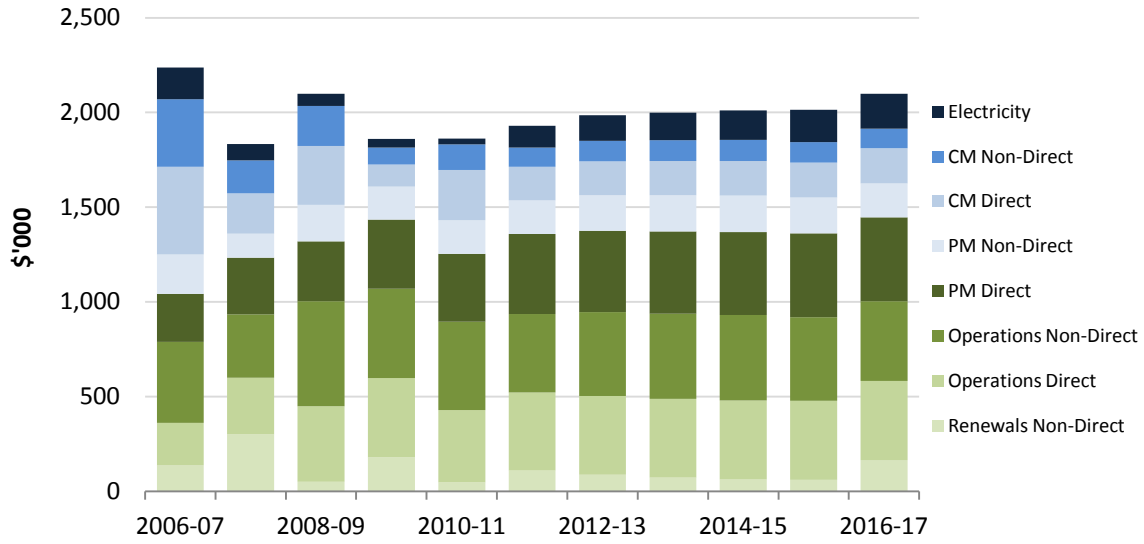
Figure 5.1: SunWater's Total Operating Costs (Real $) – All Service Contracts



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

Total operating costs in Emerald Distribution System (all sectors) are shown in Figure 5.2, Tables 5.1 and Table 5.2.

Figure 5.2: Total Operating Costs – Emerald Distribution System (Real $)



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 5.1: Operating Costs by Activity – Emerald Distribution System (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	653	635	955	889	849	827	858	866	869	858	838
Electricity	166	86	64	47	32	114	135	145	157	170	184
Preventive maintenance	462	425	508	539	536	600	617	625	630	631	623
Corrective maintenance	820	387	523	206	400	279	288	291	294	293	288
Renewals non-direct	136	300	50	181	47	110	88	72	62	61	166
Total	**2,236**	**1,833**	**2,099**	**1,861**	**1,863**	**1,929**	**1,986**	**1,999**	**2,011**	**2,014**	**2,098**

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 (2011), SunWater (2011ap) and SunWater (2011ao).

Table 5.2: Operating Costs by Type – Emerald Distribution System (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	442	306	424	421	402	464	471	471	471	471	471
Electricity	166	86	64	47	32	114	135	145	157	170	184
Contractors	325	229	237	232	357	238	242	245	249	253	253
Materials	146	170	242	127	130	196	198	201	204	207	207
Other	30	108	123	119	116	113	113	113	113	113	113
Non-Direct	1,127	935	1,010	916	826	804	827	823	818	800	871
Total	**2,236**	**1,833**	**2,099**	**1,861**	**1,863**	**1,929**	**1,986**	**1,999**	**2,011**	**2,014**	**2,098**

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

In its NSP, SunWater submitted that the operating costs for this scheme averaged $1.33 million per year over the period of the current price path. [Operating costs as defined in the NSP exclude the non-direct costs allocated to renewals expenditure.] The projected efficient average operating costs in the NSP for 2012-16 are $1.43 million per annum.

Other Stakeholders

No other stakeholders have commented on this matter.

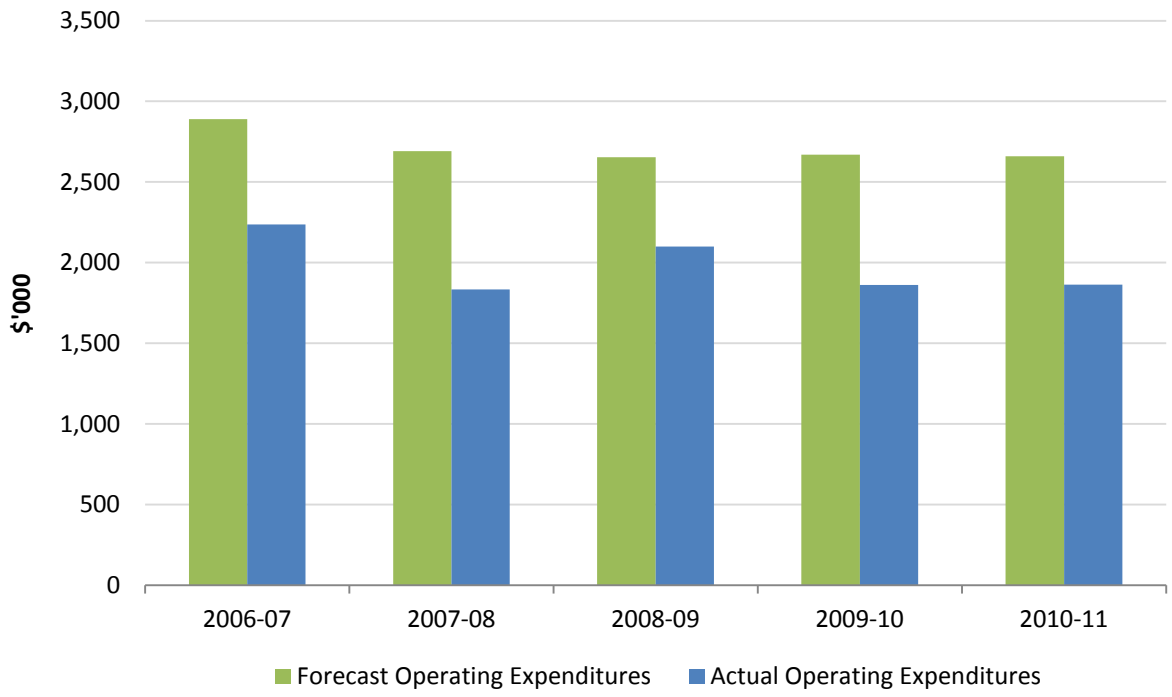
Authority's Analysis

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 2010-11, the Authority engaged Indec to assess whether SunWater achieved the cost savings forecast in 2005-06. A comparison of Indec's forecast efficient and SunWater's actual operating costs for the Emerald Distribution System is shown in Figure 5.3 below. For this scheme, SunWater's actual operating costs were less than Indec's forecast 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 adjust its costs over the 2012-17 regulatory period to the level of efficient costs determined for 2010-11. It observed that further analysis would be required to justify and support such an inference (see Volume 1). The Authority engaged other consultants to address potential scheme specific cost savings.

5.3 Non-Direct Costs

Introduction

Since structural reforms have been implemented, SunWater's is a centrally organised business. SunWater's strategic operational management is provided centrally (for example, Finance, Strategy and Stakeholder Relationships) to ensure workforce flexibility and that appropriate systems and processes are being applied consistently to address SunWater's regulatory and business requirements.

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

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

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

Previous Review

As noted above, in the previous review, Indec reviewed SunWater's non-direct costs for 2006-11. Non-direct costs were allocated to schemes using 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 5.3). 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 submitted that it believes salaries and wage costs generally will rise by 4% per annum during 2010-17. However, SunWater has forecast that its total salaries and wages will rise by only 2.5% per annum, with the difference (1.5% per annum) being accounted for by (unspecified) productivity improvements.

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

The non-direct costs and those allocated to the Emerald Distribution System are in Table 5.3 below.

Table 5.3: 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
Emerald	1,127	935	1,010	916	826	804	827	823	818	800	871

Source: SunWater (2011), SunWater (2011ap) and SunWater (2011ao).

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

Other Stakeholders

No other stakeholders have commented on this matter.

Authority's Analysis

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

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

Deloitte was unable to draw any definitive conclusions from an attempt to benchmark against the PVWB and other Australian rural water service providers. Deloitte noted that PVWB's non-direct costs were higher than those of SunWater as a percentage of total operating costs – but that there are differences between PVWB and SunWater which made the comparison unreliable.[4]

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

In addition, the Authority 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.

[4] For example, PVWB has only four FTE staff. For the benchmarking exercise, PVWB 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 PVWB's estimated apportionments with SunWater, who have around 500 staff assigned to specific projects or centralised functions.

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

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

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

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

(b) the overhead component of the Infrastructure Development unit should be allocated (on the basis of DLC) to service contracts receiving services from that unit (that is, targeted DLC).

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

The Authority's recommended level of non-direct costs to be recovered from the Emerald Distribution System (from all customers) is set out in Table 5.5 below.

Table 5.4: 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	1,127	935	1,010	916	826	804	827	823	818	800	871
Authority							775	792	861	746	799

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

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 cost 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 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 5.5 below. The estimates reflect SunWater's most recent positions and data provided to the Authority in October 2011.

These estimates differ from the NSP as they reflect SunWater's updated insurance premiums (post 2010-11 floods) and updated electricity cost forecasts (intended to account for a price on carbon and other expected increases).

Table 5.5: SunWater Direct Operating Expenditures by Activity (Real $'000)

	2006-07	*2007-08*	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*	*2016-17*
Operations	226	299	399	416	382	412	416	416	417	417	417
Preventive maintenance	254	299	316	365	358	422	428	433	438	442	442
Corrective maintenance	463	214	310	117	265	177	180	181	183	185	185
Electricity	166	86	64	47	32	114	135	145	157	170	184
Total	**1,109**	**898**	**1,089**	**945**	**1,037**	**1,125**	**1,159**	**1,176**	**1,194**	**1,214**	**1,227**

Note: Totals vary from NSP as data reflects 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: Source: Source: SunWater (2011ap) and SunWater (2011ao).

Table 5.6 presents the same operating costs developed by SunWater by type.

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

	2006-07	*2007-08*	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*	*2016-17*
Labour	442	306	424	421	402	464	471	471	471	471	471
Electricity	166	86	64	47	32	114	135	145	157	170	184
Materials	146	170	242	127	130	196	198	201	204	207	207
Contractors	325	229	237	232	357	238	242	245	249	253	253
Other	30	108	123	119	116	113	113	113	113	113	113
Total	**1,109**	**898**	**1,089**	**945**	**1,037**	**1,125**	**1,159**	**1,176**	**1,194**	**1,214**	**1,227**

Note: Totals vary from NSP as data reflects 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: Source: SunWater (2011ap) and SunWater (2011ao).

Authority's Analysis

The Authority engaged Halcrow to review the prudency and efficiency of SunWater's proposed direct operating expenditure.

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

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

(a) attain greater operating efficiency;

(b) achieve greater transparency;

(c) facilitate future price reviews; and

(d) promote more meaningful stakeholder engagement.

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

Item 1: Operations

Stakeholder Submissions

SunWater

Operations costs 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, administration and environmental and land management.

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

SunWater's proposed operations costs are set out in Table 5.5 above.

SunWater noted that recreation facilities at Fairbairn Dam continue to be operated and maintained by SunWater, providing the forecast costs in Table 5.7.

The Authority notes that SunWater considers recreational facility costs to be a bulk cost (recovered through bulk water tariffs). They are presented here for information, but are considered in the Nogoa-Mackenzie WSS report.

Table 5.7: Recreational Facility Costs (Real $'000)

	2011-12	*2012-13*	*2013-14*	*2014-15*	*2015-16*
Recreational Facility Cost	493	364	372	383	361

Source: SunWater (2011).

SunWater is currently seeking to transfer its responsibility for the Fairbairn Dam recreational facilities to local government.

Other Stakeholders

During Round 2 consultation in April 2011, stakeholder sought clarification of whether the costs associated with the operation, maintenance and renewal of the outlet for Fairbairn Dam to the Selma distribution system are allocated to the bulk or distribution scheme.

Authority's Analysis

Consultant's Review

Halcrow provided a breakdown of historical operations expenditure into key sub-activities as shown in Table 5.8. A similar breakdown for forecast expenditure was not provided by SunWater.

Table 5.8: Breakdown of Historical Operations Expenditure ($'000 July 2011)

	2006-07	*2007-08*	*2008-09*	*2009-10*
Customer Management [5]	15	-	-	36
Workplace H&S	-	-	1	-
Environmental Management	-	-	14	24
Water Management	2	-	-	1
Scheme Management	7	160	414	390
Dam Safety	-	-	-	-
Schedule/Deliver	643	463	498	423
Metering	-	8	15	16
Facility Management	-	-	-	-
Other	-14	4	12	-1
Total	**653**	**635**	**955**	**889**

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

Halcrow noted that the historical data contains some inaccurate coding to sub-activities, and that 2006-07 has the majority of anomalies because many expenses were retrospectively re-categorised to fit into the Business Operating Model structure (new organisational structure) and this was a not a precise process. Halcrow also noted that:

(a) scheme management costs have also increased, these relate to management time (regional and scheme), supervisor time costs and insurance costs and rates; and

(b) customer management expenditure is now predominantly captured as indirect and overhead costs.

[5] Customer management relates to activities associated with customer interfacing and enquiries; billing and account management; and water trading activities. These activities are now predominantly captured as indirect and overhead costs.

Table 5.9: Operations Expenditure by Type – Emerald Distribution System (Real $'000)

	2006-07	*2007-08*	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*
Labour	188	166	246	276	280	284	288	288	288	288
Materials	-1	35	14	13	16	16	16	17	17	17
Contractors	31	5	21	13	-	-	-	-	-	-
Other	7	93	117	114	99	99	99	99	99	99
Total Direct Costs	**226**	**299**	**399**	**416**	**395**	**400**	**404**	**404**	**405**	**405**
Indirect	196	153	282	172	148	132	153	157	159	156
Overhead	231	182	274	300	280	282	288	292	294	285
Total Operating Costs	**653**	**635**	**955**	**889**	**823**	**814**	**846**	**853**	**859**	**846**
Annual change (%)		-3%	50%	-7%	-7%	-1%	4%	1%	1%	-2%

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

In its assessment of expenditure by type, Halcrow noted that labour and other costs are the most significant elements of direct expenditure. In respect of labour costs:

(a) labour costs increased between 2007-08 and 2008-09 (and maintained this higher level to 2010-11) due to increased costs as a result of increased water management and scheme management costs arising from an increase in water storage following the drought. Minimum work was undertaken in 2006-07 and 2007-08 during the drought;

(b) SunWater provided an extract of its resource planning tool used to develop labour forecasts for 2011-12. Halcrow confirmed that the forecast uses the general approach to forecasting labour costs as outlined in Volume 1. The extract indicated the direct labour charge for Emerald Distribution in 2011-12 is based on 4,675 hours per annum accounting for $211,580 of labour costs, or three FTE staff working on operations. Halcrow noted that since an allowance of approximately 5.5 to 6 FTE has been included for operations for the bulk scheme, this allowance appears high, although more information on the review of work practices and how these have driven allowances for labour hours is required to enable the prudency and efficiency assessment to be undertaken.

(c) during site visits SunWater advised that the recent restructure had resulted in a reduction of six staff in Emerald (over the bulk and distribution systems), including three reception staff a mechanical fitter and two operational staff. Halcrow was unable to confirm whether this was included in SunWater's expenditure forecasts.

In relation to other costs, Halcrow noted that these include insurance ($92,000 per annum) and rates ($4,000 per annum). Halcrow confirmed that SunWater's forecast expenditure for land and rates is in line with historical payments, and is considered appropriate.

Labour forecasts include real increases of 1.5% in 2011-12 and 2012-13, which is consistent with its Enterprise Agreement (4% nominal increase) with labour forecast to remain steady

thereafter. Forecast expenditure for materials and contractors is assumed to outstrip inflation by 1.5% per annum. [The Authority's assessment of cost escalation is provided further below].

Labour hours and charges for Corporate Council, Strategy, Health & Safety or Services Delivery resource centres are not shown on the extract of the resource planning tool provided, but account for approximately $68,000 per annum of direct labour expenditure.

Although Halcrow has been unable to undertake a detailed review of SunWater's operations expenditure, on the basis of the explanations provided by SunWater, Halcrow is generally satisfied that the expenditure appears to be reasonable although the labour expenditure is greater than expected. In order to undertake a definitive assessment of prudency and efficiency it would be necessary to see detailed activity based budgeting or at least the results of the review of work practices together with how this has informed assumptions in relation to forecast labour hours.

Conclusion

The Authority notes that, although Halcrow was unable to undertake a detailed review of operations expenditure, Halcrow was generally satisfied that the expenditure appears reasonable (although labour costs are on the upper limit of what might be expected). Halcrow did not recommend any specific adjustment to operations costs for this scheme.

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

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

Item 2: Preventive 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's proposed preventive maintenance costs are set out in Table 5.6 above.

Other Stakeholders

No other stakeholders commented on this item.

Authority's Analysis

Consultant's Review

Halcrow noted that in SunWater's reporting system, preventive maintenance consists of three activity types; namely condition monitoring, servicing and weed control.

A breakdown of historical and forecast expenditure on preventive maintenance is shown in Table 5.10.

Table 5.10: Preventive Maintenance Expenditure (Real $'000)

	2006-07	*2007-08*	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*
Labour	88	58	81	95	111	113	114	114	114	114
Materials	87	66	94	94	133	135	137	139	141	143
Contractors	71	171	139	174	170	172	175	178	180	183
Other	9	4	1	2	2	2	2	2	2	2
Total Direct Costs	**254**	**299**	**316**	**365**	**416**	**422**	**428**	**433**	**438**	**442**
Indirects	93	54	93	59	59	52	61	62	63	62
Overheads	114	72	99	115	124	125	128	129	130	127
Total	**462**	**425**	**508**	**539**	**599**	**600**	**617**	**625**	**630**	**631**
Annual change (%)		-8%	20%	6%	11%	0%	3%	1%	1%	0%
Change since 2007 (%)		-8%	10%	17%	30%	30%	34%	35%	37%	37%

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

Halcrow stated that the disaggregated cost data provided by SunWater did not separately identify expenditure associated with condition monitoring, servicing and weed control.

As evident from Table 5.10 above, SunWater is forecasting a significant increase in direct expenditure on preventive maintenance when compared to its historical expenditure. This is primarily driven by increases in labour and materials.

Halcrow provided a review of the historical and forecast preventive maintenance expenditure including weed control and condition monitoring and servicing.

(a) Weed Control

SunWater uses three approaches to weed control in the Emerald Distribution System; these include:

(a) Acrolein chemical dosing of the water held in the channel system;

(b) Chemical Weed Control – i.e. chemical spraying of weeds using "Round-up" or similar products; and

(c) Mechanical Weed Control – i.e. slashing or burning of weeds.

Chemical spraying and mechanical weed control activities are typically undertaken along channel batters, roads and in drains.

Acrolein dosing is undertaken in accordance with the following:

(a) it is only applied to the channel system (i.e. not the river system);

(b) it is applied by SunWater staff; it is not contracted out;

(c) prior to application, SunWater:

  (i) provides notification of impending application;

  (ii) puts out signs advising of application; and

  (iii) removes signs the day following application;

(d) there is a requirement that there is no system outflow during and immediately following application (flow to customer storages is allowed);

(e) Acrolein is injected at intervals along the system from a purpose built trailer, to ensure that required dosage is maintained as water flows;

(f) application is dependent upon suitable weather; and

(g) the system remains closed for a period of 48 hours (Acrolein has an effective half life of six hours).

Halcrow noted that Acrolein dosing is undertaken using a slug dosing process in all other areas of the state. In those cases, the system is completely closed and drained, and a slug dose of Acrolein is applied as the channel is refilled.

The historical expenditure in respect of weed control is shown in Table 5.11 below.

Table 5.11: Historical Preventive Maintenance Costs – Weed Control

	2006-07	*2007-08*	*2008-09*	*2009-10*
Labour	40	15	28	54
Materials	80	50	83	88
Contractors	67	149	136	171
Other	2	-	-	0
Total Direct Costs	188	214	247	313
Indirects	42	14	32	33
Overheads	54	25	41	70
Total – Weed Control	**283**	**252**	**321**	**417**

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

Halcrow noted that whilst there is an absence of clearly apparent trends in the historical expenditure, Halcrow noted that the main variances may be due to the following:

(a) there was increased weed growth in 2009-10 compared to previous years;

(b) increased labour costs in 2009-10 relate to significant weed burning activity;

(c) contractor costs in 2006-07 were significantly less than following years as this represented the end of the drought period (during which there was reduced peripheral weed growth); and

(d) reduced labour and material costs in 2007-08 indicate reduced use of Acrolein in this year.

Halcrow noted that, following the breaking of the drought in 2006-07 (or thereabouts), as well as increased moisture promoting peripheral growth, the increased runoff is likely to have carried increased nutrients into the system; this would promote the growth (weeds and algae) within the water.

The breakdown of forecast expenditure provided to this review does not separately identify all of the expenditure associated with weed control, although it does identify contract slashing costs, and materials (Acrolein).

Forecast weed control expenditure – contractors (slashing and spraying)

Halcrow noted that slashing and spraying is typically outsourced to contractors. SunWater's forecast expenditure includes an allowance of $170,000 in 2010-11 for weed control contractors. This has been inflated by four percent per annum in accordance with SunWater's assumed inflator for materials and contractors in the years 2011-12 to 2015-16. This allowance is in line with the expenditure in 2009-10, and compares to an average expenditure of $139,000 over the past four years.

During interviews with SunWater, it was noted that expenditure forecasts of 'contractors weed control' are based on existing weed control contracts, or if subject to renewal, on expectations

of what the likely contract rates will be. SunWater indicated that contracts typically run for three years, and that they are market tested when due for renewal.

As part of this review, Halcrow reviewed a copy of the weed control contract for the Emerald Distribution System.[6] The current contract is dated 16 July 2009, and runs for a period of three years. The contract is based on a schedule of rates which includes slashing of earth and lined channels banks, area drain banks and inside batters and catch drains. Blanket spraying includes drainage water ways - low flow areas, and drains and strips adjacent to channels on channel banks. SunWater has not indicated the number of slashings or blanket sprayings per year it has assumed in developing its forecast expenditure. However, the contract provides an estimate based on four slashings and five blanket sprayings per year, which amounts to approximately $214,000; this indicates that SunWater's forecast expenditure ($170,000 per annum) is based on four to five slashings and blanket sprayings per year. On the basis of the available information, Halcrow is satisfied that the allowance for 'Contractors - weed control' is both prudent and efficient.

Forecast weed control expenditure – Materials (Acrolein)

As noted above, Acrolein is applied to the channel system by SunWater staff. SunWater provided a copy of an Internal Position Paper - Acrolein, dated 30 July 2010, which detailed its approach to forecasting Acrolein usage in the coming price path period.

SunWater stated that current volumes of Acrolein use have been treated as the base line for future consumption. SunWater's historical and forecast use of Acrolein is shown in Table 5.12.

Table 5.12: Number of Acrolein Cylinders (200L) per year

	2007-08	*2008-09*	*2009-10*	*2010-11*	*Projected Annual Usage*	*Annual Cost*
Emerald Distribution System	6	3	15	16	15	$91,708

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

Halcrow noted that SunWater's use of Acrolein has fluctuated significantly over the current price path period and that SunWater has not explained the basis of its assumption of 15 cylinders for the Emerald Distribution System, other than to state that this is the volume that will be required to deliver the water and maintain customer standards of service.

Halcrow, however, noted the inherent uncertainty in forecasting Acrolein usage. The incidence of weed growth is influenced by many factors, including water turbidity (turbid water limits weed growth) and seasonal impacts. Influences that would be expected to increase weed growth (such a high rainfall) have been experienced within the past couple of years, as reflected in the recorded increase in Acrolein use. Halcrow accepted that SunWater's proposed use of Acrolein appears appropriate.

Halcrow understands that SunWater's forecast expenditure for a 200L cylinder is $6,150 ($2011 real) which is based on its last order of Acrolein in 2009-10. In an attachment to its Internal Position Paper - Acrolein, SunWater provided documentation from its US supplier which indicates that the cost of the product is to reduce by approximately 15%. However, this

[6] The contract is for both the Dawson Valley WSS and the Nogoa Mackenzie WSS.

reduction does not appear to be reflected in SunWater's forecast of expenditure. Taking into account the reduction in the unit rate of Acrolein, expenditure would be $5,200 per annum ($2011 real). Assuming 15 cylinders per annum, this is equivalent to $78,000 ($2010-11 real).

From the information provided to this review, it is not possible to identify the forecast labour expenditure associated with Acrolein dosing since the breakdown of labour expenditure presented also includes condition monitoring and servicing activities). Consequently, it has not been possible to review this expenditure.

(b) Condition Monitoring and Servicing

Halcrow noted SunWater's breakdown of historical expenditure into condition monitoring and servicing, shown in Table 5.13 below. A similar breakdown has not been provided for forecast expenditure.

Table 5.13: Historical Preventive Maintenance Expenditure - Condition Monitoring and Servicing

	2006-07	*2007-08*	*2008-09*	*2009-10*
Labour	49	44	53	41
Materials	7	15	11	5
Contractors	4	22	3	3
Other	7	4	1	2
Total Direct Costs	66	85	69	52
Indirects	51	40	61	26
Overheads	60	47	57	45
Total	**178**	**173**	**187**	**122**

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

Halcrow noted that, direct expenditure on servicing and condition monitoring is primarily associated with labour and with the exception of 2008, the direct expenditure has remained reasonably steady.

Preventive maintenance/servicing activities undertaken in respect of the Emerald Distribution System typically include:

(a) in respect of the Total Channel Control System:

  (i) maintenance of solar panels;

  (ii) battery checks and servicing; and

  (iii) flow calibration.

(b) in respect of the drainage system - de-silting and weed control.

SunWater has provided a summary listing of maintenance works orders which confirms the nature of activities undertaken. A review of the list reveals that activities are generally appropriate to operation of the irrigation scheme.

Halcrow understands that SunWater's condition monitoring and servicing forecast expenditure is primarily based on forecasts developed by PB, although it also includes allowances for additional servicing activities.

As part of the review undertaken by PB, it forecast expenditure of approximately $61,600 per annum ($2011 real) which excludes overhead and indirect costs.

The condition monitoring and servicing activities costed by PB include servicing of cranes, condition monitoring and inspection of the Selma relift pumps, servicing of gauging stations, maintenance of meters, and inspection of the Total Channel Control System. Halcrow has reviewed the listing and is satisfied that preventive maintenance activities costed by PB are consistent with the nature and required frequency of activities undertaken on the scheme.

Halcrow noted that costs associated with the Total Channel Control System should be ring-fenced, and not included within the NSP. Halcrow sought clarification from SunWater in respect of the total costs associated with the channel automation trial included in the NSP. SunWater noted that, "there is no mention of the channel automation trial in the NSP for Emerald and also no allowance for trials in the forecast figures in the financial model." However, Halcrow noted that the condition monitoring and servicing activities costed by PB include $13,332 per annum associated with the trial. These costs should be removed from the preventive maintenance expenditure.

Except for the costs associated with the Total Channel Control System, Halcrow is generally satisfied that the expenditure forecast developed by PB is based on appropriate drivers, taking into account both the nature and frequency of the activities to be undertaken. However, Halcrow noted that this estimate is built up from SunWater's existing work instructions and its current approach to maintenance, which is yet to be optimised. Consequently, there is likely to be scope to achieve efficiency savings in the delivery of servicing and condition monitoring activities.

Accounting for the forecast expenditure developed by PB, and expenditure for weed control, the remaining expenditure on preventive maintenance is approximately $92,400 per annum. This expenditure includes labour associated with dosing of Acrolein, which cannot be separately identified from the disaggregated cost data provided to this review. Halcrow noted, however, that total labour costs associated with weed control in 2009-10 amount to $54,000 ($2010-11 real). Acrolein use in this year was equal to the forecast use of 15 cylinders per annum, so in absence of more robust information, provides an indication of likely labour costs.

SunWater's forecast of preventive maintenance expenditure also includes expenditure related to "additional servicing, calibration and adjustment of equipment such as pumps, motors, regulator gates, meters and valves". SunWater has not provided any information on how it has forecast expenditure relating to these activities other than to note that it has been calculated from an average of prior years' expenditure. Consequently, Halcrow is unable to make an assessment of whether this element of preventive maintenance is prudent or efficient.

In the absence of justification for the remaining $38,400 per annum, an adjustment of the forecast preventive maintenance expenditure by this amount is proposed.

Other Stakeholders

No other stakeholders commented on this item.

SunWater's Response

SunWater noted Halcrow's comment that the Total Channel Control (TCC) preventive Maintenance Costs of $13,332 should not be recovered from irrigators.

In response, SunWater submitted that the maintenance costs relate to infrastructure that is already installed. In addition, SunWater's comment noted in the Halcrow Report was that no additional TCC infrastructure would be installed. However, NSP forecasts do and are intended to recover operating and maintenance for TCC assets that exist.

SunWater also noted Halcrow's comment that SunWater has not been able to justify $38,000 of the forecast preventive maintenance for "additional calibration, servicing" and other costs not included in the PB report.

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

Halcrow then looked to understand the basis of this residual and evaluate whether it was prudent and efficient. In some cases, Halcrow compared the residual to past labour costs for weed control, and used historic figures as proxy for weed control labour costs to recommend adjustments to the preventive maintenance activity costs.

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

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

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

(a) historic costs are heavily dependent on how employees have recorded their time, and there scope for error in these entries; and

(b) forecasts were developed at the activity, not sub-activity level. Attempts to recreate a labour or other cost at the sub activity level will be fraught and misleading.

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

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

Conclusion

In Volume 1, the Authority accepted the basis of Halcrow's adjustments to condition monitoring and services. Further, the Authority noted that most of its consultants considered that that there is scope for SunWater to achieve further efficiencies once the balance of preventive and corrective maintenance is optimised. The Authority considered that this potential for efficiency could be addressed via the broad efficiency measures imposed on SunWater schemes (noted further below).

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

(a) SunWater's maintenance plans and work instructions; and associated labour inputs and unit costs should be audited, including a review of sub-contracted maintenance activities;

(b) maintenance practices and costs need to be examined to identify the optimum mix of preventive and corrective maintenance activities for each scheme; and

(c) a Reliability Centred Maintenance (RCM) approach to formulating maintenance activity requirements should be adopted.

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

The Authority accepts Halcrow's recommendation that:

(a) in relation to weed control:

  (i) on the basis of the available information, allowance for 'Contractors - weed control' is both prudent and efficient; and

  (ii) Acrolein costs be adjusted by approximately $14,000 (to account for 15% unit rate reduction) per annum;

(b) in relation to condition monitoring and servicing:

  (i) the $13,332 per annum associated with Total Channel Control System automation trial be removed; and

  (ii) in the absence of justification for the remaining $38,400 per annum, an adjustment of the forecast preventive maintenance expenditure by this amount.

Item 3: Corrective Maintenance

Stakeholder Submissions

SunWater

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 corrective maintenance costs are set out in Table 5.6 above.

Other Stakeholders

No other stakeholders have commented on this item.

Authority's Analysis

Consultant's Review

A breakdown of historical and forecast corrective maintenance expenditure is provided in Table 5.14. Expenditure on corrective maintenance decreased significantly in the period since 2006-07, from $820,000 in 2007-07 to $206,000 in 2009-10. SunWater has forecast an increase in expenditure in 2010-11 to $279,000, after which time it is forecast to increase marginally in the period to 2012-13, then remain relatively consistent. These increases are driven by increases in labour, materials and contractors.

A significant reduction in expenditure in 2009-10 was explained by SunWater as unusually low due to wet weather.

Table 5.14: Corrective Maintenance 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*
Labour	166	81	96	50	66	67	68	68	68	68
Materials	60	69	134	20	44	44	45	45	46	47
Contractors	223	53	77	45	65	66	67	68	69	70
Other	14	10	4	2	-	-	-	-	-	-
Total Direct Costs	**463**	**214**	**310**	**117**	**175**	**177**	**180**	**181**	**183**	**185**
Indirects	168	75	105	31	35	31	36	37	37	37
Overheads	188	98	107	57	70	71	72	73	73	72
Total	**820**	**387**	**523**	**206**	**279**	**279**	**288**	**291**	**294**	**293**
Annual change (%)		-53%	35%	-61%	36%	0%	3%	1%	1%	0%
Change since 2007 (%)		-53%	-36%	-75%	-66%	-66%	-65%	-64%	-64%	-64%

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

SunWater's forecast expenditure for corrective maintenance is based on an average of the past four years (including 2010-11), excluding outliers. While SunWater has not provided details of what outliers have been excluded when forecasting expenditure on corrective maintenance, Halcrow noted that the forecast expenditure on labour, material and contractors is significantly lower than the historical average (average direct expenditure over the period 2007-08 to 2010-11 is approximately $204,000 per annum).

A breakdown of the forecast expenditure indicates labour charges relate to staff from SunWater's Northern region. The materials expenditure includes $10,000 for heavy plant and $34,000 for construction materials.

Halcrow noted that operations staff indicated that corrective maintenance activities, which are essentially repair type items of work, typically include:

(a) repair of channel slumps;

(b) repair of channel erosion (which is exacerbated by operating channels at greater than their design capacity);

(c) channel cleaning (de silting);

(d) repair of channel gates;

(e) repair of gates at supply points;

(f) repair of pipe leaks; and

(g) repair of meters (typically Dethridge Wheels, which are installed on more than 85 percent of supply points).

Following the site visit, SunWater provided a summary listing of maintenance works orders for Nogoa-Mackenzie WSS (including the Emerald Distribution System) for the period 2008-09 to 2010-11 which confirmed the nature of activities undertaken. Corrective maintenance work orders include repairs to drainage including repair of banks, desilting drains and repairs to the Selma drain LN3 pump station.

Halcrow also noted that it is very difficult to accurately forecast corrective maintenance expenditure. Given that SunWater proposed an increase in preventive maintenance expenditure over the coming price path period, a reduction in corrective maintenance is expected, as increases in preventive maintenance should ultimately result in an increase in asset reliability. SunWater's forecast of corrective maintenance appears to be relatively stable over the period 2011-12 to 2015-16, although it is very much lower than the historical average (for the period 2006-07 to 2010-11).

Further, Halcrow noted that the overall expenditure on maintenance is expected to increase over the price path period, although it remains much lower than the peak of expenditure in 2006-07. The mix of preventive to corrective maintenance is forecast to remain consistent (70%:30%) over the coming price path period.

Table 5.15: Maintenance Expenditure (Real $'000)

	2006-07	*2007-08*	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*
Preventive Maintenance	254	299	316	365	416	422	428	433	438	442
Corrective Maintenance	463	214	310	117	175	177	180	181	183	185
Total Maintenance	**717**	**513**	**626**	**482**	**591**	**599**	**608**	**614**	**621**	**627**
Annual Change	-	28%	22%	(23%)	23%	1%	2%	1%	1%	1%
Change since 2007	-	(28%)	(13%)	(33%)	(18%)	(16%)	(15%)	(14%)	(13%)	(13%)
Preventive Maintenance	35%	58%	50%	76%	70%	70%	70%	70%	71%	71%
Corrective Maintenance	65%	42%	50%	24%	30%	30%	30%	30%	29%	29%

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

Halcrow understands that SunWater is yet to review its current mix of preventive maintenance and corrective maintenance to determine whether its current approach is optimised. As identified by PB during its review of preventive maintenance, there is likely to be scope for SunWater to improve efficiencies and cost effectiveness; it recommended that SunWater bring forward its RCM initiative to optimise its maintenance activities. While it is understood that SunWater intends to act on these recommendations, Halcrow noted that the forecast expenditure in the NSPs do not reflect any savings that might be achieved as a result of their proposed implementation.

Other Stakeholders

No other stakeholders have commented on this item.

SunWater's Response

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

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

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

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

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

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

Conclusion

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

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

Item 4: Electricity

Stakeholder Submissions

SunWater

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

The electricity costs for the bulk supply relate mainly to outlet works actuation, SCADA, lighting for access and security and the flood harvesting pumps of the Gattonvale Offstream Storage. The forecast electricity costs are based on an average volume of water pumped to storage.

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 this item.

Authority Analysis

Consultant's Review

Halcrow noted that expenditure on electricity in the Emerald Distribution Scheme reduced each year over the period 2006-07 to 2009-10. SunWater has forecast that expenditure will double to approximately $95,000 in 2010-11, and remain steady in real terms thereafter.

Table 5.16: Electricity Expenditure (Real $'000)

	2006-07	*2007-08*	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*
Electricity	166	86	64	47	95	95	95	95	95	95
Annual Change	-	(48.2%)	(25.6%)	(26.6%)	102.1%	-	-	-	-	-
Change Since 2007	-	(48.2%)	(61.4%)	(71.7%)	(42.8%)	(42.8%)	(42.8%)	(42.8%)	(42.8%)	(42.8%)

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

In its NSP, SunWater stated that the electricity costs for the scheme primarily relate to the operation of the Selma Pump Station, and smaller re-lift pump stations at Selma Drain LN3, Selma Lateral S1B, Selma Lateral S2A, and Selma Lateral S3A. It has also noted that the re-lift pump stations relate to individual customers.

SunWater forecast electricity using historical data, by calculating an average cost per volume of metered water delivered to customers.

Noting that only the Selma sub-system requires pumping, and only when Fairbairn Dam drops below a 66.8% capacity, SunWater calculated an average pumping cost per megalitre (ML) based on the average cost of water delivered over three years to 2009-10 in the Selma sub-system. SunWater indicated that its forecast has been developed on what it has termed to be an 'average' year, and that it did not use 2005-06 and 2006-07 usage as these were drought years (with greater than typical expenditure). Halcrow noted that there is a lack of clarity surrounding SunWater's interpretation of an 'average' year, particularly given that the basis for calculating an 'average' year varies across the different expenditure items and activities.

Selma pump station was only used once in the three years to 2009-10 (in 2007-08) and the re-lift pumps were used continuously in this period. The average cost ($2.57/ML) has been inflated by 13.29%, which is the increase in Franchise Tariffs between 2009-10 and 2010-11. This results in an average pumping cost of $2.91/ML. The forecast usage across the Selma sub-system is 32,691ML per annum, which is the average volume of water delivered in the three

years 2007-08 to 2009-10. This results in a forecast of expenditure on electricity of approximately $95,000 per annum.

The use of an average flow driver (calculated over a number of years) to forecast electricity expenditure in the Selma sub-system appears appropriate, although Halcrow notes that a forecast based on electricity consumption (kWh) would eliminate the impact of the movement in historical expenditure resulting from tariff increases.

Table 5.17 provides a breakdown of electricity usage over the period from 2005-06 to 2009-10.

Table 5.17: Historical Electricity Usage (Real $'000)

	2006-07	*2007-08*	*2008-09*	*2009-10*	*2006-07*
kWh	1,578,511	1,337,781	826,068	153,934	248,023
ML Pumped	-	39,613	18,049	2,413	4,359
ML Delivered	31,050	23,734	18,554	21,237	28,283
Pumping Costs	186,028	167,910	77,153	58,958	45,647
$/ML	5.99	7.07	4.16	2.78	0.78
$/kWh	0.12	0.13	0.09	0.38	0.18

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

Using the average electricity consumption for the years 2007-08 to 2009-10, and assuming the same proportion of peak to off-peak usage as in 2009-10 (the only years for which peak and off-peak data has been provided), results in an average electricity usage of approximately $85,000 per annum.

Halcrow noted that Fairbairn Dam has been operating at 100% capacity since September 2010, and that it is unlikely that SunWater will be required to operate the Selma sub-system pumps for the next two to three years. Halcrow is of the opinion that the forecast expenditure should be re-phased, to more accurately reflect the likely incurrence of the expenditure.

Halcrow's assessment of SunWater's expenditure proposal is included in Table 5.18 below.

Table 5.18: Electricity Expenditure (Real $'000)

	2011-12	*2012-13*	*2013-14*	*2014-15*	*2015-16*
SunWater Forecast	95	95	95	95	95
Halcrow Assessment	-	-	-	95	95
Difference	(95)	(95)	(95)	-	-

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

SunWater's Response

SunWater noted that in regards to electricity costs for Selma pumping, Halcrow found that SunWater's assumption did not take account of the current level of Fairbairn Dam. Halcrow assumed that there is no pumping in 2011-12, 2012-13 and 2013-14, and $95,000 was the cost of pumping in 2014-15 and 2015-16.

In response, SunWater submitted that Halcrow failed to recognise Selma relift pumps that operate regardless of storage elevation and misunderstood the methodology applied by SunWater when forecasting electricity costs for Emerald Distribution.

Conclusion

The Authority has accepted Halcrow's specific recommended adjustments to electricity for this scheme and has reduced SunWater's forecasts by $95,000 in 2012-13 and 2013-14 (before any changes to escalation).

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's recommended electricity costs are set out below.

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 (electricity has been dealt with above).

Direct Labour

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

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

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

Direct Materials and Contractors

Most consultants agreed that SunWater's proposed escalation factor of 4% per annum for this component of cost was appropriate. Evidence in support included the historical analysis of Australian Bureau of Statistics (ABS) construction cost data and forecasts of industry trends. However, both Halcrow and GHD considered that SunWater had not provided sufficient

rationale for its proposed escalation factor of 4% per annum for direct materials and contractor services, and that these costs should be escalated at the general rate of inflation.

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

Other 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 Emerald Distribution System is set out Table 5.19 below.

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 5.16: Direct Operating Costs (Real $'000)

	SunWater					***Authority***				
	2012-13	***2013-14***	***2014-15***	***2015-16***	***2016-17***	***2012-13***	***2013-14***	***2014-15***	***2015-16***	***2016-17***
Operation	416	416	417	417	417	398	399	400	401	402
Electricity	135	145	157	170	184	15	16	124	130	136
Preventive Maintenance	428	433	438	442	442	409	412	415	417	416
Corrective Maintenance	180	181	183	185	185	171	173	174	175	175
Direct Operating Costs	**1,159**	**1,176**	**1,194**	**1,214**	**1,227**	**993**	**999**	**1,113**	**1,124**	**1,129**

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

5.5 Cost Allocation According to WAE Priority

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

Previous Review

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

Stakeholder Submissions

SunWater

SunWater (2011j) has proposed to assign operating costs to users on the basis of their current WAE, except for non-direct costs allocated to renewals (on the basis of DLC) which are to be allocated to priority groups using WAE.

Other Stakeholders

The Central Highlands Cotton Growers submitted support for the principle of user-pays for the correct apportionment of costs.

Authority's Analysis

In Volume 1, the Authority has summarised the views of its consultants and has recommended that, in relation to distribution systems fixed operating costs in be allocated to medium and high priority customers using current WAEs. Variable costs should be allocated to medium and high priority WAE on the basis of water use.

The Authority recommends that for distribution systems insurance premiums are also allocated on the basis of current WAEs.

The effect for the Emerald Distribution 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 5.17. The Authority's recommended operating costs are set out in Table 5.18.

Table 5.17: SunWater's Proposed Operating Costs (Real $'000)

	2012-13	*2013-14*	*2014-15*	*2015-16*	*2016-17*
Operations					
Labour	288	288	288	288	288
Materials	16	17	17	17	17
Contractors	0	0	0	0	0
Other	111	111	111	111	111
Non-Direct	442	450	452	441	421
Preventive Maintenance					
Labour	114	114	114	114	114
Materials	137	139	141	143	143
Contractors	175	178	180	183	183
Other	2	2	2	2	2
Non-Direct	188	192	193	189	181
Corrective Maintenance					
Labour	68	68	68	68	68
Materials	45	45	46	47	47
Contractors	67	68	69	70	70
Other	0	0	0	0	0
Non-Direct	108	110	111	108	103
Electricity	135	145	157	170	184
Total	**1,898**	**1,927**	**1,949**	**1,953**	**1,932**

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

	2012-13	*2013-14*	*2014-15*	*2015-16*	*2016-17*
Operations					
Labour	275	277	279	281	283
Materials	16	16	16	16	16
Contractors	0	0	0	0	0
Other	107	106	105	104	103
Non-direct	430	431	426	410	384
Preventive Maintenance					
Labour	109	110	111	111	112
Materials	131	132	133	134	133
Contractors	167	168	169	170	169
Other	2	2	2	2	2
Non-direct	184	184	183	176	166
Corrective Maintenance					
Labour	65	65	66	66	67
Materials	43	43	43	44	43
Contractors	64	64	65	65	65
Other	0	0	0	0	0
Non-direct	105	106	105	101	95
Electricity	15	16	124	130	136
Total Operating Costs	**1,713**	**1,720**	**1,826**	**1,811**	**1,774**

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 CPI. Interim prices in 2011-12 were increased by CPI with additional increases in some schemes.

For the Emerald Distribution System, prices in year one of the 2006-11 price paths were adjusted to reflect the agreed tariff structure (see Chapter 3 – Pricing Framework), and then increased by CPI thereafter. In 2011-12, prices were increased by CPI.

6.2 Approach to Calculating Prices

In order to calculate SunWater's irrigation prices in accordance with the 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 Emerald Distribution System 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 Emerald Distribution System (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	**2,139**	**1,284**	**1,783**	**1,482**	**1,655**	**1,792**	**1,965**	**2,011**	**2,069**	**2,099**	**2,090**
Renewals Annuity	456	280	303	360	338	400	495	511	544	553	553
Operating Costs	2,100	1,533	2,049	1,680	1,816	1,819	1,898	1,927	1,949	1,953	1,932
Revenue Offsets	-418	-529	-570	-558	-500	-427	-427	-427	-424	-407	-395
Authority's Total Costs							**1,910**	**1,939**	**2,093**	**2,101**	**2,086**
Renewals							623	645	689	696	706
Operating Costs							1,713	1,720	1,826	1,811	1,774
Revenue Offsets							-427	-427	-424	-407	-395
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: SunWater (2011ap) and QCA (2011).

6.4 Fixed and Variable Costs

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

SunWater submitted that all of its operating costs are fixed in the Emerald Distribution System and that only electricity pumping costs vary with water use.

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 distribution systems, Indec considered 67% of costs would be fixed and 33% variable. However Indec proposed that scheme-specific tariff structures should be applied, to reflect the relevant scheme costs.

For Emerald Distribution System, Indec recommended 80% of costs should be fixed and 20% variable under optimal management. The Authority notes that this ratio differs from the current tariff structure which reflects the recovery of 63% of costs in the fixed charge and 37% of costs in the volumetric charge.

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

6.5 Allocation of Costs According to WAE Priority

Fixed Costs

The method of allocating fixed costs to priority groups is outlined in Chapter 4 – Renewals Annuity and Chapter 5 – Operating Costs. The outcome is summarised in Table 6.2 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	1,442	1,466	1,590	1,600	1,590
High Priority	19	20	21	21	21
Medium Priority	1,423	1,446	1,568	1,578	1,569

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

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

Variable Costs

Variable costs are allocated to all users on the basis of water use. Volumetric tariffs are calculated based on SunWater's eight-year historical water usage data for all sectors. However, consistent with SunWater's assumed typical year for operating cost forecasts, the Authority has removed from the eight years of data, the three lowest water-use years for each service contract. Accordingly, to determine the volumetric charge, the Authority has assumed historical total water use for all sectors to be 74.9% 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.

As noted in Chapter 3 Pricing Framework, drainage and drainage diversion charges have been rolled forward in real terms.

Table 6.3: Medium Priority Prices for the Emerald Distribution System ($/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 (Unbundled)											
Fixed (Part A)	5.12	5.28	5.52	5.72	5.88	6.08	7.16	7.34	7.52	7.71	7.90
Volumetric (Part B)	6.73	6.93	7.26	7.49	7.71	7.99	1.10	1.12	1.15	1.18	1.21
Channel (Unbundled)											
Fixed (Part C)	12.56	12.88	13.52	13.92	14.36	16.88	22.24	22.79	23.36	23.95	24.54
Volumetric (Part D)	6.10	6.28	6.58	6.78	7.00	7.25	8.26	8.47	8.68	8.90	9.12
Channel (Bundled)											
Fixed (Part A)	17.68	18.16	19.04	19.64	20.24	22.96	nr	nr	nr	nr	nr
Volumetric (Part B)	12.83	13.21	13.84	14.27	14.71	15.24	nr	nr	nr	nr	nr

Note: nr – not relevant. Source: Actual Prices (SunWater, 2011al) and Cost Reflective Prices (QCA, 2011).

Table 6.4: High Priority Prices for the Emerald Distribution System ($/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 (Unbundled)											
Fixed (Part A)	12.80	13.20	13.80	14.24	14.68	15.20	24.25	24.86	25.48	26.12	26.77
Volumetric (Part B)	6.73	6.93	7.26	7.49	7.71	7.99	1.10	1.12	1 15	1.18	1.21
Channel (Unbundled)											
Fixed (Part C)	31.40	32.32	33.80	34.88	35.92	39.20	22.24	22.79	23.36	23.95	24.54
Volumetric (Part D)	6 10	6.28	6.58	6.78	7.00	7.25	8.26	8.47	8.68	8.90	9.12
Channel (Bundled)											
Fixed (Part A)	44.20	45.52	47.60	49.12	50.60	54.40	nr	nr	nr	nr	nr
Volumetric (Part B)	12.83	13.21	13.84	14.27	14.71	15.24	nr	nr	nr	nr	nr

Note: nr – not relevant. Source: Actual Prices (SunWater, 2011al) and Cost Reflective Prices (QCA, 2011).

Table 6.5: Termination Fees including GST ($/ML)

	Actual Prices				Cost Reflective Prices				
	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Medium Priority	121.05	119.42	135.50	174.11	305.74	313.38	321.22	329.25	337.48
High Priority	302.61	299.24	338.95	404.33	305.74	313.38	321.22	329.25	337.48

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

Table 6.6: Drainage Charges ($/ha of land)

	Actual Prices						Calculated Prices				
	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Irrigable Land	18.75	19.33	20.25	20.85	21.45	22.20	22.76	23.32	23.91	24.50	25.12
Non-Irrigable Land	4.70	4.85	5.05	5.20	5.35	5.50	5.64	5.78	5.92	6.07	6.22

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

Table 6.7: Drainage Diversion Charges ($/ML)

	Actual Prices						*Calculated Prices*				
	2006-07	***2007-08***	***2008-09***	***2009-10***	***2010-11***	***2011-12***	***2012-13***	***2013-14***	***2014-15***	***2015-16***	***2016-17***
Up to 2 ML	191.00	191.00	191.00	191.00	191.00	191.00	195.78	200.67	205.69	210.83	216 10
Between 2 & 100 ML	6.55	6.55	6.55	6.55	6.55	6.55	6.71	6.88	7.05	7.23	7.41

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

6.7 Queensland Government Pricing Policies

As noted above, the Queensland Government has directed that:

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

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

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

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

Authority's Analysis

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

The Authority has calculated these current revenues using the relevant 2010-11 prices, current irrigation WAE and the five-year average (irrigation only) water use during 2006-11 (Table 6.8).

To ensure that distribution customers are not disadvantaged by unbundling, the comparison has included both bulk and distribution system revenues.

On this basis, current revenues are below the level required to recover prudent and efficient costs for the medium priority tariff group (Table 6.4). In Volume 1, the Authority recommended that, after tariff rebalancing, fixed charges should increase by $2/ML per annum in real terms until cost recovery is achieved. This is consistent with the pace of increase in 2006-11 prices. Volumetric charges are to reflect variable costs from 2012-13.

After tariff rebalancing, the $2/ML real increase is applied to the revenue-neutral bundled fixed charge until 2015-16 when cost reflective bundled charges are achieved. The recommended (unbundled) Part C charges are calculated by deducting the recommended river medium priority tariff from the bundled medium priority tariff.

For the high priority tariff group, current revenues are above the level required to recover prudent and efficient costs for the medium priority tariff group (Table 6.8). The Authority is required to recommend prices that maintain revenues in real terms for this tariff group.

Table 6.8: Comparison of Current Prices and Cost-Reflective Prices

Tariff and Priority Group	*2010-11 Prices $/ML (indexed to 2012-13)*		*Irrigation WAE (ML)*	*Irrigation Water Use (ML)*	*Current Revenue*	*Revenue from Cost-Reflective Tariffs*	*Difference*
	Fixed	*Variable*					
Medium Priority Bundled	21.26	15.45	86,145	42,101	2,482,506	2,926,280	-443,774
High Priority Bundled	53.16	15.45	1,172	573	71,158	59,842	11,315

6.8 The Authority's Recommended Prices

The Authority's recommended prices to apply to the Emerald Distribution System for 2012-17 are outlined in Table 6.9 and Table 6.10 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 6.9: Draft Medium Priority Prices for the Emerald Distribution System ($/ML)

	Actual Prices						*Recommended Prices*				
	2006-07	*2007-08*	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*	*2016-17*
River											
Fixed (Part A)	5.12	5 28	5.52	5.72	5.88	6.08	10.05	10.30	10.55	10.82	11.09
Volumetric (Part B)	6.73	6 93	7.26	7.49	7.71	7.99	1.10	1.12	1.15	1.18	1.21
Channel (Unbundled)											
Fixed (Part C)	12.56	12.88	13.52	13.92	14.36	16.88	14.34	16.75	19.27	20.84	21.36
Volumetric (Part D)	6.1	6 28	6.58	6.78	7	7.25	8.26	8.47	8.68	8.90	9 12
Channel (Bundled)											
Fixed (Part A)	17.68	18.16	19.04	19.64	20.24	22.96	nr	nr	nr	nr	nr
Volumetric (Part B)	12.83	13.21	13.84	14.27	14.71	15.24	nr	nr	nr	nr	nr

Note: nr - not relevant. Prior to 2012-17, channel tariffs were a bundled price for bulk and distribution services. Thus, the fixed Part C tariffs for 2006-12 represent a notional unbundled channel price calculated by deducting Part A River prices from (bundled) Part A Channel prices. Source: Actual Prices (SunWater, 2011al) and Recommended Prices (QCA, 2011).

Table 6.10: Draft High Priority Prices for the Emerald Distribution System ($/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 (Unbundled)											
Fixed (Part A)	12.80	13.20	13.80	14.24	14.68	15.20	21.29	23.87	25.48	26.12	26.77
Volumetric (Part B)	6.73	6.93	7.26	7.49	7.71	7.99	1.10	1.12	1.15	1.18	1 21
Channel (Unbundled)											
Fixed (Part C)	31.40	32.32	33.80	34.88	35.92	39.20	32.99	31.76	31.55	32.34	33.15
Volumetric (Part D)	6.10	6.28	6.58	6.78	7.00	7.25	8.26	8.47	8.68	8.90	9 12
Channel (Bundled)											
Fixed (Part A)	44.20	45.52	47.60	49.12	50.60	54.40	nr	nr	nr	nr	nr
Volumetric (Part B)	12.83	13.21	13.84	14.27	14.71	15.24	nr	nr	nr	nr	nr

Note: nr - not relevant. Prior to 2012-17, channel tariffs were a bundled price for bulk and distribution services. Thus, the fixed Part C tariffs for 2006-12 represent a notional unbundled channel price calculated by deducting Part A River prices from (bundled) Part A Channel prices. Source: Actual Prices (SunWater, 2011a1) and Recommended Prices (QCA, 2011).

The Authority's recommended draft termination fees to apply to the Emerald Distribution System during 2012-17 are outlined in Table 6.11 together with actual termination fees since 2008-09. The Authority's recommended termination fees differ from those charged by SunWater, as the Authority's approach:

(a) recovers 20 years of fixed costs with SunWater bearing the remaining fixed costs. SunWater's approach recovers 10 years of fixed costs with remaining fixed costs paid for by other users;

(b) reflects the Authority's estimate of fixed costs in the cost-reflective fixed charge. The Authority's cost-reflective fixed charge recovers all fixed costs. SunWater's fixed charges recover only a portion of fixed costs. Therefore, some fixed costs are excluded from SunWater's termination fees;

(c) reflects the Authority's cost-reflective fixed charge and not the Authority's recommended fixed charge; and

(d) results in a multiple of up to 13.8 times the Authority's cost reflective fixed charge. SunWater's multiple is up to 9.4 of its fixed charge (Chapter 3).

Table 6.11: Draft Termination Fees ($/ML)

	Actual Prices				*Recommended Prices*				
	2008-09	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*	*2016-17*
Medium Priority	121.05	119.42	135.50	174.11	305.74	313.38	321.22	329.25	337.48
High Priority	302.61	299.24	338.95	404.33	305.74	313.38	321.22	329.25	337.48

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

The Authority's recommended drainage and drainage diversion charges to apply to the Emerald Distribution System in 2012-17 are outlined in Table 6.12 and Table 6.13 together with actual drainage and drainage diversion charges since 2006-07.

Table 6.12: Draft Drainage Charges ($/ha of land)

	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*
Drainage Charges (Irrigable Land)	18.75	19.33	20.25	20.85	21.45	22.20	22.76	23.32	23.91	24.50	25.12
Drainage Charges (Non-Irrigable Land)	4.70	4.85	5.05	5.20	5.35	5.50	5.64	5.78	5.92	6.07	6.22

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

Table 6.13: Draft Drainage Diversion Charges ($/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*
Up to 2 ML	191.00	191.00	191.00	191.00	191.00	191.00	195.78	200.67	205.69	210.83	216 10
Between 2 & 100 ML	6.55	6.55	6.55	6.55	6.55	6.55	6.71	6.88	7.05	7 23	7.41

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)*
Selma Drain Ln3 Pump Station	2016-17	Upgrade electrical circuitry at pump station	20
	2026-27	Replace Cable And Cableways	33
	203031	Replace Pump	106
	2032-33	Replace Switchboard - Main/Control	46
Selma Drainage	2011-12	Refurbish: Selma Drains - Desilt drains- new strategy - SEL	84
	2013-14	Refurbish: Selma Drains - Desilt drains- new strategy - SEL	88
	2014-15	Refurbish rock drops (CS01 through CS05)*	23
		09EIA-SELMA DRAINS - REFURBISH FENCING	11
	2015-16	Refurbish: Selma Drains - Desilt drains- new strategy - SEL	89
	2017-18	Refurbish: Selma Drains - Desilt drains- new strategy - SEL	87
		Refurbish:ailway& road - OK - install ARMCO barriers - public safety/MRD standard - $10,000 @ 2001 - replace barriers @ 20yr intervals	11
	2019-20	Refurbish: Selma Drains - Desilt drains- new strategy - SEL	87
	2020-21	09EIA-SELMA DRAINS - REFURBISH FENCING	11
	2021-22	Refurbish: Selma Drains - Desilt drains- new strategy - SEL	86
	2023-24	Refurbish: Selma Drains - Desilt drains- new strategy - SEL	86
		Refurbish: Install ARMCO barriers - public safety/MRD standard - $10,000 @ 2001 - replace barriers @ 20yr intervals	11
		Refurbish: Tyson Road - install ARMCO barriers - public safety/MRD standard - $10,000 @ 2001 - replace barriers @ 20yr intervals	11
	2024-25	Refurbish rock drops (CS01 through CS05)*	22
	2025-26	Refurbish: Selma Drains - Desilt drains- new strategy - SEL	86
	2026-27	09EIA-SELMA DRAINS - REFURBISH FENCING	11
	2027-28	Refurbish: Selma Drains - Desilt drains- new strategy - SEL	86
	2029-30	Refurbish: Selma Drains - Desilt drains- new strategy - SEL	86
		11NMA22 Refurbish Selma Drains	62
	2030-31	Replace Surge Tank 335.28M	205
	2031-32	Refurbish: Selma Drains - Desilt drains- new strategy - SEL	86
		Refurbish:ailway& road - OK - install ARMCO barriers - public safety/MRD standard - $10,000 @ 2001 - replace barriers @ 20yr intervals	11
	2032-33	Replace Pipeline 144.71-1631.48M	664
		Replace Cattle Fence 775-3375M	15
		09EIA-SELMA DRAINS - REFURBISH FENCING	11
	2033-34	Refurbish: Selma Drains - Desilt drains- new strategy - SEL	86
		Refurbish: Install ARMCO barriers - public safety/MRD standard - $10,000 @ 2001 - replace barriers @ 20yr intervals	61
	2034-35	Refurbish rock drops (CS01 through CS05)*	22
	2035-36	Refurbish: Selma Drains - Desilt drains- new strategy - SEL	86
		Replace Gauging Equipment	23
Selma Irrigation Distribution	2016-17	Refurbish: Fencing - first 20km grazing land - require fencing - 20km to 50km no fencing (cropping) - allow (this refers to Selma Ma	34

Asset	*Year*	*Description*	*Value ($'000)*
		Refurbish Control Gate (seals, slides, pivot points, actuators) - Selma MC Gate CR01	11
	2017-18	Replace Gauging Equipment	11
	2018-19	Replace Control Equipment	357
		Replace Monitoring Equipment (Tcc)	135
		Replace Control Equipment Gate 1 (Left) (Master)	105
		Replace Control Equipment Gate 2 (C/Left) Slave	105
		Replace Control Equipment Gate 3 (C/Right) Slave	105
		Replace Control Equipment Gate 4 (Right) Slave	105
	2019-20	10EIA23-DESILT DRAINS SELMA MAIN CHANNEL	59
		Replace Control Equipment	35
		Replace Control Equipment (Master)	35
		Replace Control Equipment (Slave)	35
	2020-21	Replace Escape Mats Synthetic Liner 31309-34225M	40
		Replace Escape Mats	31
		Replace Escape Mats Synthetic Liner 34225-36411M	30
	2021-22	Refurbish: Fencing - first 20km grazing land - require fencing - 20km to 50km no fencing (cropping) - allow (this refers to Selma Ma	34
		Replace Walkway	20
		Replace Control Structure 244.45	16
		Refurbish: Capricorn Highway Siphon - safety/trash screens - $10,000 @ 20yr intervals - next 2000	11
	2022-23	Replace Structure	203
		Replace Scour Outlet	16
	2023-24	Replace Concrete Lining	116
		Replace Gate,	100
		Refurbish: public safety/MRD standard - $5,000 @ 2001 - replace barriers @ 20yr intervals - actual spend	11
	2024-25	Replace Hdpe Synthetic Liner 31309-34225M	666
		Replace Hdpe Synthetic Liner 34225-36411M	443
		Replace Hdpe Synthetic Liner 564-1703M	256
		Replace Pipeline (525 Dia)	174
		Replace Hdpe Synthetic Liner 36-496M	156
		Replace Hdpe Synthetic Liner 1703-2348M	138
		Replace Siphon Inlet 496.82	13
	2025-26	Replace Gate, 600Mm Vert Slide Batescrew	11
		Replace Acrolein Shed 55.00	10
	2026-27	Replace Channel Lining Polyethylene	202
		Refurbish: Fencing - first 20km grazing land - require fencing - 20km to 50km no fencing (cropping) - allow (this refers to Selma Ma	33
		Refurbish Control Gate (seals, slides, pivot points, actuators) - Selma MC Gate CR01	11
	2028-29	Replace Gate 2 & Actuator, Flumegate Rubicon	113
		Replace Gate 3 & Actuator, Flumegate Rubicon	113
		Replace Gate 4 & Actuator, Flumegate Rubicon	76
		Replace Gate 1 & Actuator, Flumegate Rubicon	75
	2029-30	10EIA23-DESILT DRAINS SELMA MAIN CHANNEL	59
		Replace Gate 4 & Actuator, Flumegate Rubicon	37
	2031-32	Replace Concrete Lining (2032)	4,785

Asset	*Year*	*Description*	*Value ($'000)*
		Refurbish: Fencing - first 20km grazing land - require fencing - 20km to 50km no fencing (cropping) - allow (this refers to Selma Ma	33
	2032-33	Replace Pipeline	460
		Replace Structure	109
		Replace Gauging Equipment	11
		Replace Air Vent	11
	2033-34	Replace P/Line (600Dia)7445.96-8446.43	504
		Replace Control Equipment	353
		Replace Pipeline (450 Dia)	326
		Replace Monitoring Equipment (Tcc)	133
		Replace Pipeline (600 Dia)	127
		Replace Control Equipment Gate 1 (Left) (Master)	104
		Replace Control Equipment Gate 2 (C/Left) Slave	104
		Replace Control Equipment Gate 3 (C/Right) Slave	104
		Replace Control Equipment Gate 4 (Right) Slave	104
		Replace Pipework	94
		Replace Pipeline (525 Dia)	22
	2034-35	Replace Control Equipment	35
		Replace Control Equipment (Master)	35
		Replace Control Equipment (Slave)	35
		Replace Structure	26
	2035-36	Replace P/Line(525 Dia)8446.43-9705.75	659
		Replace Control Equipment-Level & Rtu	63
		Replace Recorder Building	23
Selma Lat S1_B Irrigation Dist	2013-14	Replace Air Valve	13
	2018-19	Replace Monitoring Equipment (Tcc)	35
	2033-34	Replace Monitoring Equipment (Tcc)	35
		Replace Air Valve	13
Selma Lat S1_B Pump Station	2014-15	Replace Delivery Pipeline	15
	2015-16	Refurbish pump	17
	2019-20	Replace Pump	18
	2025-26	Refurbish pump	17
		Replace Motor	11
	2035-36	Refurbish pump	17
Selma Lat S2_A Pump Station	2023-24	Replace Soft Starter, Aucom	30
		Refurbish motor - bearings, rewind if required (after proposed replacement 2009)	11
	2024-25	Replace Pump	123
		Replace Pipe Work	60
Selma Lat S3_A Pump Station	2020-21	Refurbish Pstn - minor mech, elec & pipework repairs - last carried out in 2001(JA)	11
	2029-30	Replace Pump, Ajax	39
		Replace Motor, Electric	15
	2030-31	Replace Pipework	67
		Replace Concrete Works	24
		Refurbish Pstn - minor mech, elec & pipework repairs - last carried out in 2001(JA)	11

Asset	*Year*	*Description*	*Value ($'000)*
Selma Pump Station	2011-12	12EIA-REFURBISH PUMP	44
		10EIA-REFURBISH MOTOR PUMP 1 SELMA	29
		10EIA-REFURBISH MOTOR PUMP 3 SELMA	29
		Replace Pump No1 Isolator Cubicle	27
		Replace Pump No2 Isolator Cubicle	27
		Replace Pump No3 Isolator Cubicle	27
		Replace Main Switchboard	22
		Replace Distribution & Lighting S/Boar	11
		Replace Switchboard In/Out Gate Winches	11
	2012-13	Replace Logic And Control	197
		Replace Low Voltage Switchboard	43
		Options analysis to investigate imminent replacement	11
	2013-14	Refurbish Gate - blast, paint, anodes, new seals, install SS bolts	45
		Refurbish Hoist - Overhaul motor & electrics & replace ropes	23
	2014-15	10EIA18-Refurbish pump No.2 Selma P/Stn	53
		Replace Cable And Cableway	25
		Refurbish Mech & Elec - controls, hoists, paint	23
	2015-16	11EIAXX Repair No.1 Pump Selma P/Stn	65
		Scope and documentation for SCADA replacement for following year	11
	2016-17	Replace Pump	126
		Change Out: $100,000 every 15 years for automation - SCADA.	113
		Replace Motor	95
		12EIA-REFURBISH PUMP	45
		10EIA-REFURBISH MOTOR PUMP 1 SELMA	30
		10EIA-REFURBISH MOTOR PUMP 3 SELMA	30
	2018-19	Replace Monitoring Equipment (Tcc)	32
	2019-20	10EIA18-Refurbish pump No.2 Selma P/Stn	52
	2020-21	11EIAXX Repair No.1 Pump Selma P/Stn	64
		Refurbish Bulkheads - paint & seals	23
	2021-22	12EIA-REFURBISH PUMP	45
		10EIA-REFURBISH MOTOR PUMP 1 SELMA	29
		10EIA-REFURBISH MOTOR PUMP 3 SELMA	29
		Refurbish Pipework - incl. Pump casing -last crried out in 2001 (JA)	22
	2022-23	Replace Cable And Cableway	179
		Refurbish Pipework - incl. Pump casing	45
	2023-24	Replace Winch, 15T Forrers P/L (Outlet)	90
		Replace Winch, 15T Forrers P/L (Inlet)	79
	2024-25	Replace Trash Racks	66
		10EIA18-Refurbish pump No.2 Selma P/Stn	51
		Replace Pump, Submersible Grundfos	16
	2025-26	11EIAXX Repair No.1 Pump Selma P/Stn	63
	2026-27	12EIA-REFURBISH PUMP	44
		10EIA-REFURBISH MOTOR PUMP 1 SELMA	29
		10EIA-REFURBISH MOTOR PUMP 3 SELMA	29
		10EIA25-RFRBSH MOTOR PUMP 2 SELMA(plan)	28
	2027-28	Replace Logic And Control	195

Asset	*Year*	*Description*	*Value ($'000)*
	2028-29	Replace 3.3Kv Switch Board Cubicle	319
	2029-30	10EIA18-Refurbish pump No.2 Selma P/Stn	51
	2030-31	11EIAXX Repair No.1 Pump Selma P/Stn	63
		Scope and documentation for SCADA replacement for following year	11
	2031-32	Replace Transformer, 500Kva Fpe	337
		Change Out: $100,000 every 15 years for automation - SCADA.	111
		12EIA-REFURBISH PUMP	44
		10EIA-REFURBISH MOTOR PUMP 1 SELMA	29
		10EIA-REFURBISH MOTOR PUMP 3 SELMA	29
	2033-34	Refurbish Gate - blast, paint, anodes, new seals, install SS bolts	44
		Replace Monitoring Equipment (Tcc)	31
	2034-35	Replace Pump	510
		Replace Electric Motor	179
		10EIA18-Refurbish pump No.2 Selma P/Stn	51
	2035-36	11EIAXX Repair No.1 Pump Selma P/Stn	63
		11EIA10 Conduct 10 Yr Insp. Selma Crane	16
		11EIA09 Conduct 10Y Insp Sel FWG Winches	16
Selma S2_A Irrigation Distrib	2024-25	Replace Delivery Pipeline	50
Selma Scada	2011-12	Replace radio and antenna Selma TCC system	22
	2013-14	Replace Rtu (Fairbairn Dam Right Bank Inlet Tow)	25
	2014-15	Replace Selma P/Stn Automation	29
	2018-19	Replace Opal St Water Tower - Repeat Stn / Monit	12
	2029-30	Replace Selma P/Stn Automation	28
	2035-36	Replace Emerald Office Repeater Stn	73
		Replace Fairbairn Dam Water Tower - Repeater Stn	54
System	2025-24	10EIA21-REGRAVEL AREA ROADS-SELMA	75
Weemah Drainage	2011-12	09EIA-REFURBISH: DESILT WEEMAH DRAINS	12
	2014-15	09EIA-REFURBISH: DESILT WEEMAH DRAINS	12
	2017-18	09EIA-REFURBISH: DESILT WEEMAH DRAINS	12
	2020-21	09EIA-REFURBISH: DESILT WEEMAH DRAINS	12
	2023-24	09EIA-REFURBISH: DESILT WEEMAH DRAINS	11
	2026-27	09EIA-REFURBISH: DESILT WEEMAH DRAINS	11
	2029-30	09EIA-REFURBISH: DESILT WEEMAH DRAINS	12
	2032-33	09EIA-REFURBISH: DESILT WEEMAH DRAINS	11
	2034-35	Replace Boundary Fence 1235M-6620M	36
	2035-36	09EIA-REFURBISH: DESILT WEEMAH DRAINS	11
Weemah Irrigation Distribution	2012-13	Reshape upper berms of channel - WMC	37
	2016-17	Refurbish: Fencing - first 33km grazing land - require fencing - 33km to 50km no fencing (cropping)	11
	2019-20	10EIA17-REFURB & GRADE CATCH DRAIN-WMC	22
		Replace Structure, 100Mm Meter Outlet	12
	2020-21	Windmill Gully Siphon - security fence, safety/trash screens, hand rails- last completed 2000 (JA)	23
		Refurbish:: replace ARMCO gate @ 40yr @ $4,000	23
		Siphon - security fence, safety/trash screens, hand rails - $15,000 @ 20yr intervals - Last completed 2000 (JA)	17

Asset	*Year*	*Description*	*Value ($'000)*
		Siphon - security fence, safety/trash screens, hand rails - $15,000 @ 20yr intervals - Last completed in 2000 (JA)	17
		Refurbish:Concrete sills with ARMCO gates & handrails - replace ARMCO gate & rails @ 40yr @ $4,000	14
		Replace Structure, Meter Outlet 9A-9C (Manifold)	12
	2021-22	Replace Cross Channel Walkway At 40220M	22
		Replace Cross Channel Walkway At 31425M	22
		Refurbish: Fencing - first 33km grazing land - require fencing - 33km to 50km no fencing (cropping)	11
	2022-23	Refurbish: Gregory Highway Siphon - security fence, safety/trash screens, hand rails - $15,000 @ 20yr intervals - next 2002	17
		Refurbish: lack's Gully Siphon - security fence, safety/trash screens, hand rails - Last 2002 (JA)	17
		Siphon - security fence, safety/trash screens, hand rails - $15,000 @ 20yr intervals - Last 2002 (JA)	17
		Siphon railway - safety/trash screens, hand rails - Last carried out 2002 (JA)	17
		Old Faithful Siphon - safety/trash screens, hand rails - Last carried out 2002 (JA)	11
	2025-26	Replace Acrolein Shed 70.00	10
	2026-27	Replace Channel Lining Polyethylene	292
		Refurbish: Fencing - first 33km grazing land - require fencing - 33km to 50km no fencing (cropping)	11
	2029-30	Replace Safety Screen	120
		10EIA17-REFURB & GRADE CATCH DRAIN-WMC	22
	2031-32	Refurbish: Fencing - first 33km grazing land - require fencing - 33km to 50km no fencing (cropping)	11
	2034-35	Screen: replace Al @ $1,500, After replacement of the whole asset, replace @ 25yr intervals	52