Irrigation Price Review Submission

Appendix I

Pricing arrangements for irrigation customers

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1. Irrigation prices

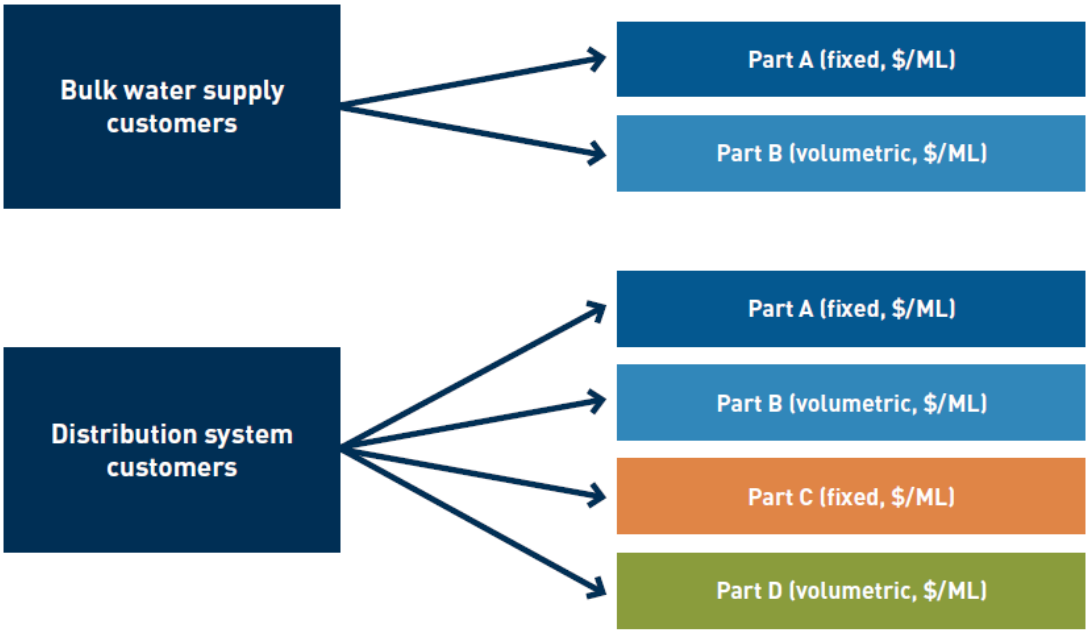
1.1 Irrigation prices

Irrigation prices take the form of a two-part tariff:

- Fixed tariffs — also known as Part A tariffs (in bulk water supply schemes) and Part C tariffs (in distribution systems) — are paid according to the amount of water access entitlements held by irrigators. These tariffs are 'fixed' to the extent the volume of water allocation[1] held by the customer, regardless of their actual water use in the year, does not change. However, the fixed charges will vary between customers based on their water access entitlement.
- Volumetric tariffs — also known as Part B tariffs (in bulk water supply schemes) and Part D tariffs (in distribution systems) — are charges paid per megalitre of actual water used by the customer, measured at the meter or 'offtake'.

Figure 1.1 illustrates the tariffs payable by bulk water supply and distribution system customers. In the Mareeba-Dimbulah water supply scheme a fixed annual access charge per customer also applies.

Figure 1.1: Irrigation pricing tariffs



In addition to the above tariffs, SunWater charges for other scheme-specific costs such as drainage. Chapter 6 of our main submission provides further detail on the regulated charges associated with these costs and our proposed pricing arrangements for the next price path period.

1.2 Process for setting irrigation tariffs

In our conversation with customer representatives, it was apparent that there was some confusion about the process for setting irrigation prices as well as how SunWater's costs relate to prices and Queensland

[1] A water allocation is a volume of water that entitles the holder/customer to a percentage of that water based on the available water in the scheme's dams, weirs or barrages. The percentage of water allocation available to the customer can be as high as 100 per cent or as low as 0 per cent, depending on the level of water storages.

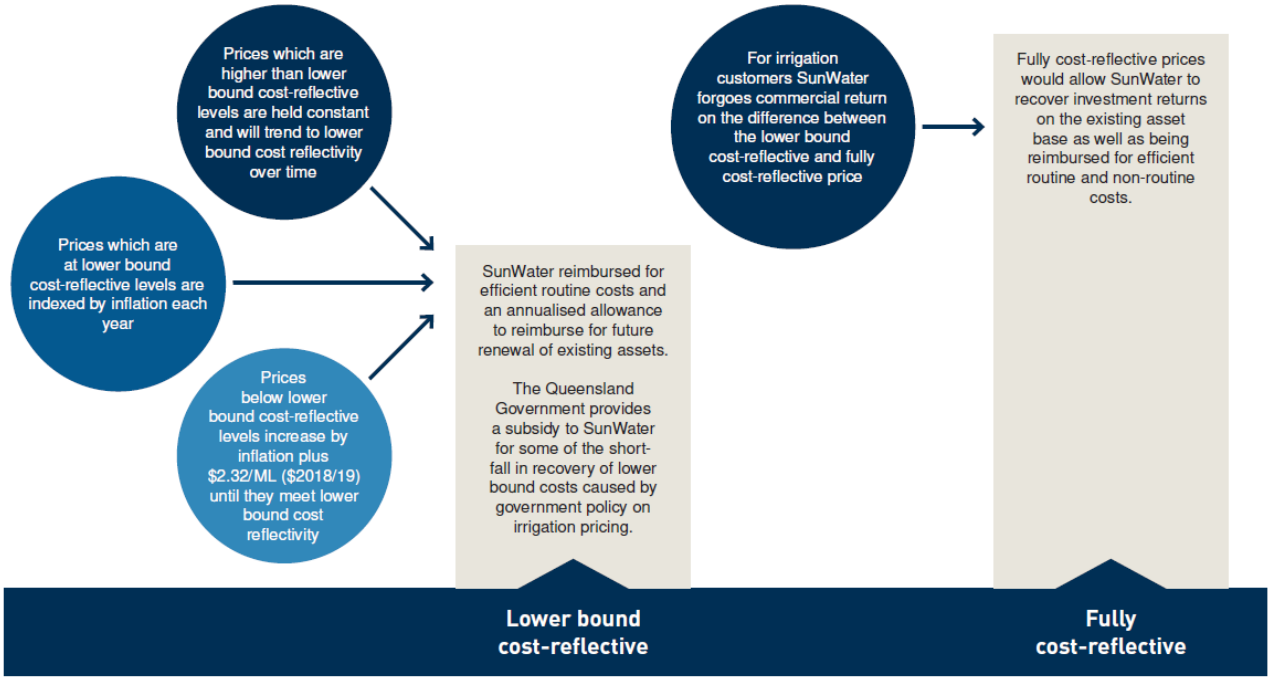
Government subsidies. This section explains how the Queensland Competition Authority's (**QCA**) price review process fits in with the prices ultimately paid by irrigation customers.

1.2.1 The QCA's role and the Ministerial referral notice

The QCA is responsible for recommending the rural irrigation prices to be charged by SunWater. It performs its function under a referral notice issued by the Treasurer of Queensland.[2] The referral notice issued to the QCA on 29 October 2018[3] sets out matters the QCA must consider when recommending irrigation prices for the 2020/21 to 2023/24 price path period (the 'terms of review').

The Queensland Government keeps prices for irrigation customers low by asking the QCA to recommend prices based on what is termed "lower bound costs".[4] In other words, the QCA recommends prices based on a set of costs that only recover our efficient routine costs and an annualised annuity allowances to reimburse us for the future renewal of existing assets over time. This keeps prices lower than under a fully cost-reflective regime.

Figure 1.2: Queensland Government lower bound cost-reflective arrangements for irrigation customers



In addition, the Queensland Government has directed the QCA to limit price increases on fixed charges, which recover the majority of our costs. These price caps have already been set and are not influenced by our submission or by the QCA's investigation.

If prices for fixed charges are above lower bound costs, the Queensland Government has specified that prices are to be frozen until lower bound costs catch up over time. If prices for fixed charges are below lower bound costs, the annual increases are to be no more than inflation plus $2.32 per megalitre

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2 Pursuant to section 23 of the *Queensland Competition Authority Act 1997.*

3 See http://www.qca.org.au/Water/Rural/Irrigation-price-investigations/In-Progress/Irrigation-Price-Review-2020%E2%80%9324.

4 Under the Council of Australian Governments' Water Resource Pricing Principles, lower bound pricing allows a water business to recover, at least, the operational, maintenance and administrative costs, externalities, taxes or tax equivalent regime (not including income tax), the interest cost on debt, dividends (if any) and make provision for future assets refurbishment/replacement. Dividends should be set at a level that reflects commercial realities and stimulates a competitive market outcome. On the other hand, under upper bound pricing, a water business should not recover more than the operational, maintenance and administrative costs, externalities, taxes or tax equivalent regime, provision for the cost of asset consumption and cost of capital (the latter being calculated using a Weighted Average Cost of Capital).

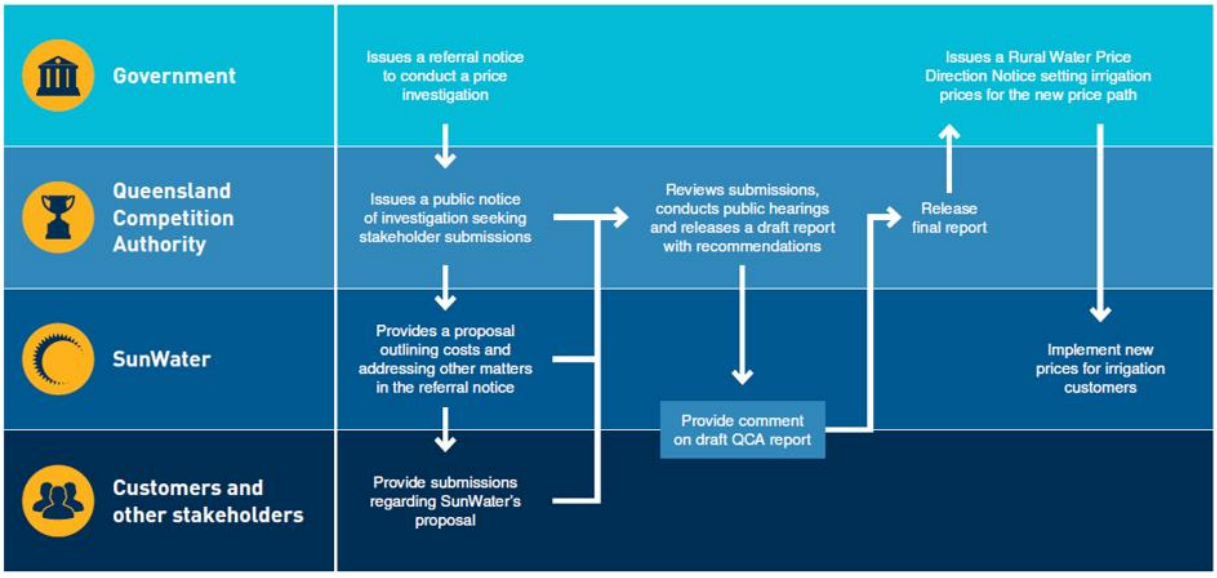
($2018/19) maintained in real terms. This is described in Figure 1.2 above. It was evident from our discussions that customers rely on this price cap to manage affordability impacts.

The referral notice sets out other conditions which minimise the amount of costs that are recovered from irrigation customers including:

- a cap of $2.5 million for the costs the QCA incurs in undertaking the review
- no cost recovery for the provision of recreation facilities that would not otherwise be incurred to supply water, unless the QCA is satisfied that there is customer support for these costs to remain included
- allowing the QCA to consider less than cost-reflective volumetric (Part B and Part D) prices where necessary to moderate bill impacts.

The QCA's recommendations are considered by SunWater's shareholding Ministers, the Treasurer and the Minister for Natural Resources, Mines and Energy, who together make the final decision on our rural irrigation prices. SunWater is then issued with a formal direction to charge our irrigation customers these prices.

Figure 1.3: Process for setting irrigation prices



1.2.2 SunWater's role in price recommendations

To assist the QCA in its review, our submission details the services we offer to irrigation customers and the associated costs of providing these services. The QCA assesses this, and other submissions, and makes recommendations on the revenue we need to recover our prudent and efficient costs. It then calculates draft recommended irrigation prices.

Some of the prices for rural irrigation water supplied by SunWater do not recover the costs of supply. For tariff groups where prices do not recover the minimum cost of supply, SunWater receives community service obligation (**CSO**) payments to make up some of the shortfall (administered by the Department of Natural Resources, Mines and Energy). Currently, the CSO is linked to the QCA's estimate of the required CSO from 2012 (adjusted for inflation) which is significantly less that the actual shortfall between irrigation revenues and the costs of supply. This results in operating losses being incurred in SunWater's irrigation business.

1.3 Principles of pricing

The QCA is likely to recommend pricing arrangements for SunWater consistent with broader economic pricing principles which the QCA has already considered in the following documents:

- Statement of Regulatory Pricing Principles, August 2013[5]
- Statement of Regulatory Pricing Principles for the Water Sector, December 2000.[6]

The QCA's own pricing principles reflect the views of experts that volumetric charges should reflect the marginal cost of supply. In its advice for the QCA in respect of the last irrigation price review, Synergies noted that costs for bulk water schemes are almost fully fixed, with distribution services also reflecting a fixed cost to the business except potentially in respect of pumping costs.[7] Synergies also noted the Australian Competition and Consumer Commission's (**ACCC**) advice to governments which emphasised the need for volumetric charges to recover only the marginal cost of supply:

> *To promote allocative efficiency, the price charged for water delivery services should reflect the cost of providing them at the margin. That is, the price for having an additional ML of water delivered to the farm-gate should equal the marginal cost incurred in delivering this extra ML of water. Since irrigators use delivery services up until the point where the marginal benefit they derive equals the price of the service, this ensures that water is delivered up to the point where the marginal benefits are equal to the marginal costs. At present, some infrastructure operators in the southern Murray–Darling Basin have usage fees for delivery that are substantially greater than the marginal cost of delivery...*[8]

The QCA gave special consideration of pricing principles as part of its last review through the PricewaterhouseCoopers (**PwC**) report, Pricing Principles and Tariff Structures for SunWater's Water Supply Schemes (September 2010). All these reports note the importance of efficient price signals; which theory would suggest occurs when price is set equal to marginal cost.

However, as with most large infrastructure businesses, the marginal cost of producing an additional unit of good or service will not cover all costs. On this basis:

- The principles reflect long run marginal cost (**LRMC**), rather than short run marginal costs.
- A two-part tariff should be adopted in which volumetric charges reflect LRMC and fixed charges recover any shortfall in costs that need to be recovered.

The QCA and other economic experts differentiate marginal cost from variable cost. LRMC is the change in total costs when the last additional unit of output is produced, whereas variable costs reflect the extent to which costs may vary up or down in correlation to some movement in one or more factors of production. To suggest both concepts are inter-changeable would misrepresent the pricing principles the QCA has established in other reviews.

However, all publications recognise that even the application of LRMC estimates is difficult and costly to administer, and less transparent where it is not adequately understood by customers. In these circumstances, the QCA believes other factors should be considered. This includes developing structures which are forward looking and reflect the future cost of providing water services and to aid users' decisions as to whether to consume water in the future.

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5 See http://www.qca.org.au/Other-Sectors/Research/Pricing-(1)/Regulatory-objective-and-pricing-principles/Final-Report/Statement-of-Regulatory-Pricing-Principles.

6 See http://www.qca.org.au/Water/Queensland-wide-issues/Water-Pricing-Principles/Final-Report/Water-Pricing-Principles.

7 Synergies, *Rural Water Pricing Business and Scheme Overview*, a report to the QCA, January 2010, p147.

8 ACCC, *A regime for the calculation and implementation of exit, access and termination fees charged by irrigation water delivery businesses in the southern Murray-Darling Basin*, advice to the Australian, New South Wales, South Australian and Victorian Governments, 6 November 2006, p17.

In respect of the recovery of "residual" (non-marginal) costs, SunWater applies differential pricing at two levels:

- location, where prices generally reflect the costs applicable to a scheme or service contract area
- customer entitlement. In effect, high priority results in a higher reliability of receiving water. One unit of high priority water has more hydrologic value, and is usually worth more, than one unit of medium priority water. SunWater therefore allocates efficient lower bound costs on the basis of customers' share of converted nominal allocations.

1.3.1 Applying pricing principles to current tariff structure pricing arrangements

As noted above, prices set at SunWater's marginal cost are likely to recover only a fraction of the underlying costs. While, in theory, economically efficient prices would allocate residual costs to a fixed charge, the QCA recognises that externalities and risk considerations may warrant some adjustment.

The QCA's pricing principles also refer to the need to balance volumetric and fixed charges to reflect the underlying risks and externalities of irrigation water supply.

For example, in schemes where there are water shortages, tariff structures weighted towards consumption-based or volumetric charges may provide an incentive for users to engage in efficient water use practices and to trade water saved through efficient use. However, it also creates a mismatch between how the revenue is collected and how the costs are incurred. The QCA's pricing principles suggest that it may be appropriate to use some proportion of residual costs for a volumetric charge (as a substitute for LRMC which is otherwise difficult and complicated to calculate) where it promotes efficiency and does not lead to distortionary behaviour.

PwC considered that these alternative arrangements should take into account:

- efficiency (including price signals to the holders of water entitlements)
- suitability for application in variable climatic conditions and demand conditions
- financial viability and the revenue stability for SunWater
- administrative simplicity
- the benefits of further price differentiation, for example, between distribution and bulk water charges within a water supply scheme, other scheme segments and between customer groups.

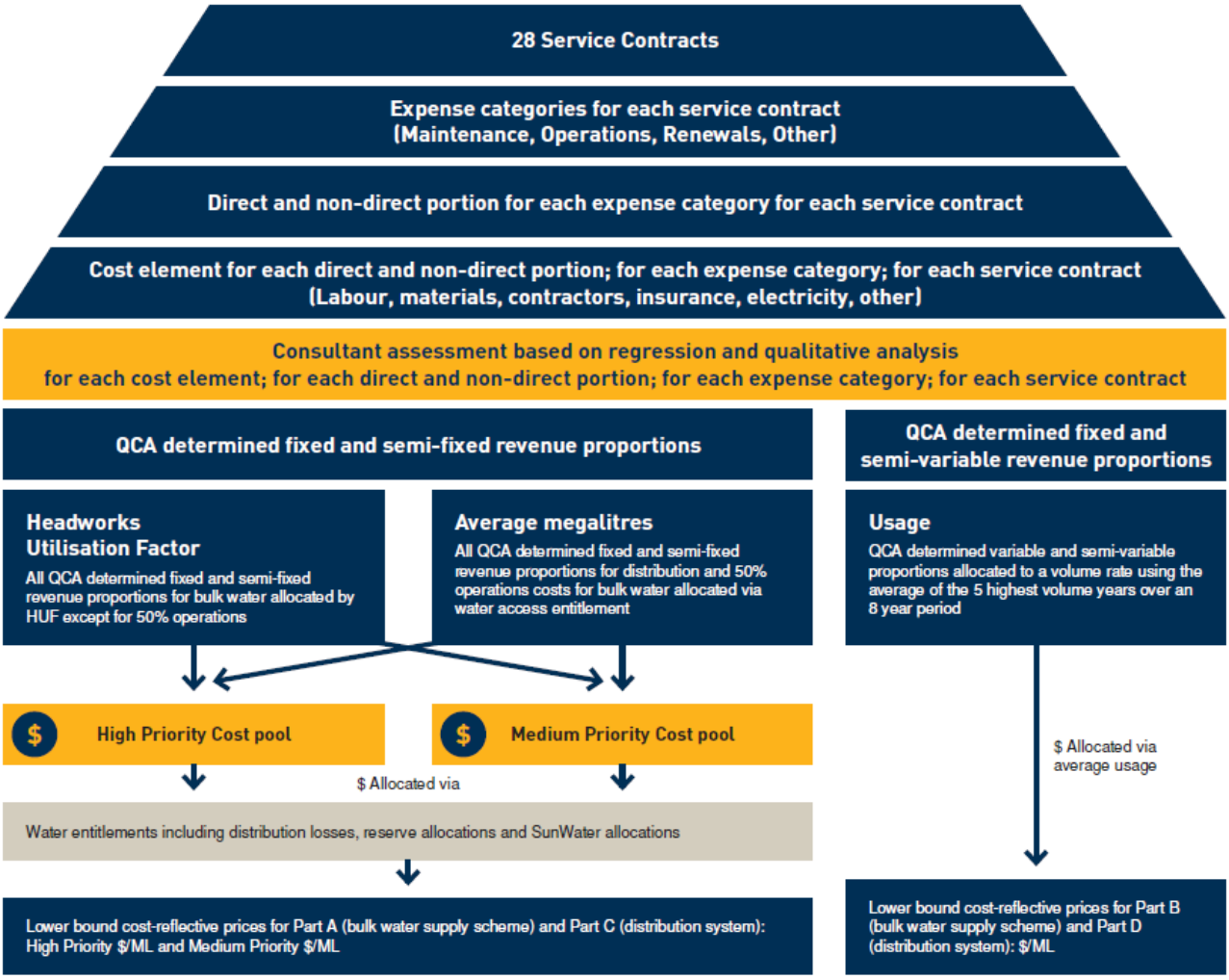
The concern with current pricing arrangements set by the QCA is that they attempt to affirm a level of precision in the determination of fixed and variable costs that appears inconsistent with these principles. The QCA previously engaged INDEC to undertake a review of SunWater's costs in order to assign revenues to fixed and variable components that are relatively consistent with underlying fixed and variable costs.

INDEC carried out regression analysis of historical costs for the period July 2007 to June 2011 against water usage and used a decision rule to infer that an R-squared of 0.6 or more indicates that a 60 per cent change in water use explains a change in another variable (such as labour hours).

In addition to this quantitative analysis, INDEC used its own judgement to determine what it considers an optimal management approach based on its experience of reviewing and benchmarking utility industries and its knowledge of SunWater's business operations gained during the 2006–11 irrigation price review. This included a view that, in times of low water demand, operations and maintenance activities can be reduced.

Using this analysis, INDEC determined the different proportions of fixed and variable costs that should apply to each cost activity in each service contract area (by bulk water and distribution schemes). The resultant process for determining prices in each of the service contract areas is described in Figure 1.4.

Figure 1.4: Current process for determining prices



1.3.2 SunWater's concern with current pricing arrangements

The process of establishing different fixed and variable proportions for each service contract and for each expenditure category is, at best, likely to derive a subjective allocation between costs which are predominantly fixed in the short- to medium-term — a portion of which may vary under some circumstances. INDEC found some loose correlation between usage and some cost categories. However, even INDEC acknowledges correlation does not necessarily imply causation. While correlations may provide valuable clues regarding causal relationships among variables, a high correlation between two variables does not necessarily represent adequate evidence that changing one variable has resulted, or may result, from changes of other variables.

In addition, the correlation analysis results did not meet the strict decision criteria required to establish beyond doubt whether historical costs were fixed, variable or semi-variable with a variation in customer water use.

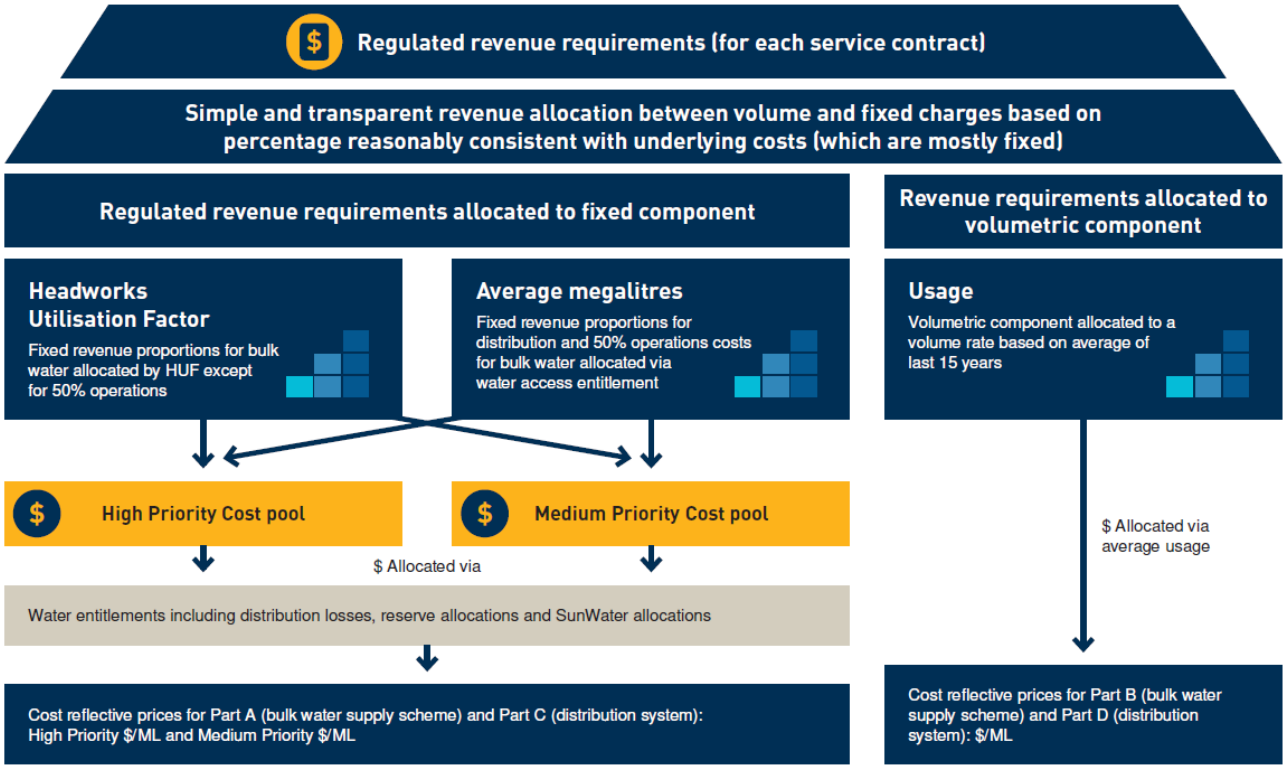
In any case, the QCA's own pricing principles recognise that using variable costs as an allocator for the volumetric charge is a second-best solution to efficient pricing which is necessary because of difficulties in calculating marginal costs for rural water supply. Creating a level of complication to derive precise measurements of variable costs on this basis seems inappropriate and costly, for no real tangible benefit to customers.

2. SunWater's preferred pricing methodology

SunWater proposes a revenue allocation[9] that simplifies current arrangements to three broad levels:

1. A simpler allocation of revenues for each service contract between fixed and variable proportions based on a high-level estimate of variable costs that also considers some level of incentive for water efficiency.
2. A methodology for further allocation of the fixed allowance to reflect different water priorities (high priority and medium priority).
3. Allocation to fixed (Part A and C) and volumetric (Part B and D) charging components.

Figure 2.1: Proposed process for determining prices



2.1 Preferred approach to allocating revenues between fixed and volumetric components

SunWater proposes a simpler and more transparent approach to maintain the same relative proportions of fixed and volumetric allocations for all service contracts. Our proposed allocations, which are relatively consistent with the previous price path period allocations, are set out in Table 2.1.

This approach is preferable for the following reasons:

- By the very nature of the service, the marginal cost for an extra unit of water is very small for our schemes.
- Assigning 100 per cent of residual costs to a fixed or capacity charge may result in inequitable outcomes so some recovery of residual costs through usage is warranted.

[9] For clarification purposes, we have not made any adjustments for costs transfers between bulk water supply schemes and distribution systems for the use of dual function assets.

- Of all cost categories, electricity costs are most likely to be driven by water use and therefore should be 100 per cent allocated to usage charges — this allows for some ability to manage risks to customers from volatile electricity pricing (as explained in Section 2.4).
- The balance of residual costs allocated to usage charges reflects a similar proportion of allocation between fixed/capacity and usage charges to what was applied in the previous price path period, but without the complexity in the calculation of the allocation method which occurred in 2012.

Table 2.1: Proposed percentage allocation to fixed charge

Fixed cost allocation (by cost type)	% Fixed
Operations (excluding electricity & insurance)	90%
Insurance	100%
Electricity	0%
Revenue offsets	90%
Preventative maintenance	90%
Corrective maintenance	90%
Renewals annuity	100%
Dam Improvement Program	100%

2.2 Allocation between high priority and medium priority users

Revenues that are to be recovered by the fixed charge component need to be allocated between high and medium priority water allocations (including among urban, industrial and irrigation water users). Allocations for irrigation purposes are mainly assigned as medium priority, whereas allocations for urban and industrial purposes are predominantly assigned a high priority status.

Essentially, higher priority represents a higher reliability of water supply. This can mean access to medium priority water is prohibited before access to higher priority water begins to reduce. On this basis, high priority water allocations have a higher proportion of fixed revenues allocated to them as they derive greater benefit from the infrastructure. This allocation of costs between high and medium priority customers is undertaken through two methodologies:

1. Allocation of revenues based on the Headworks Utilisation Factor (**HUF**).
2. Allocation of revenues based on the water access entitlement.

2.2.1 Allocation according to the HUF

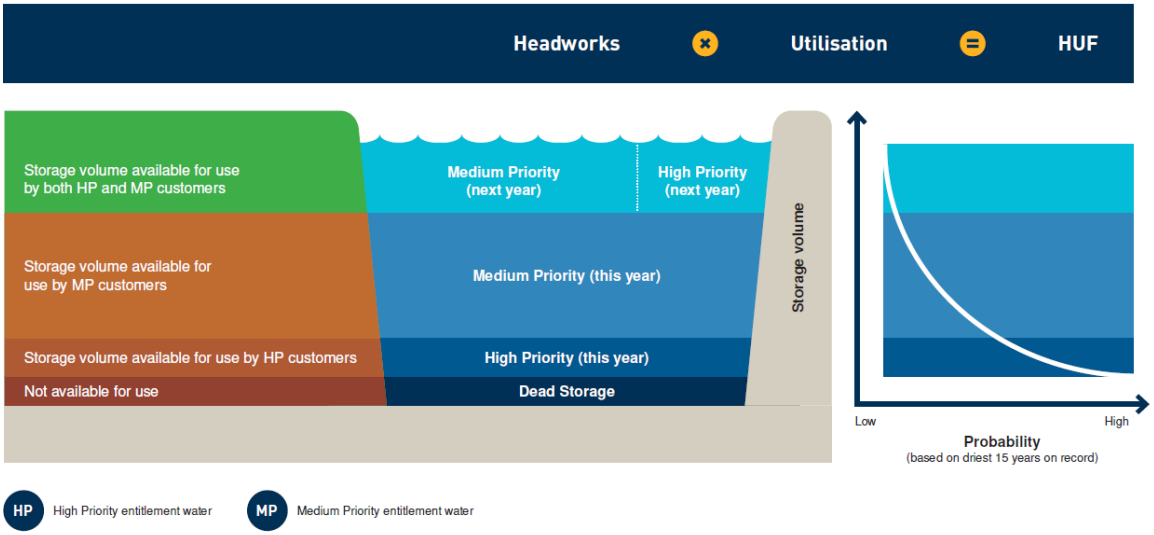
For bulk water supply schemes, the revenue to be recovered by the fixed charge component are allocated between different water allocation groups based on the relevant HUF (except for 50 per cent of the fixed revenue portion of operating costs which are allocated based on water access entitlements, see below). The HUF methodology seeks to identify the percentage of volumetric capacity able to be used by different priority groups, taking into consideration:

- the application of operational requirements, water sharing rules and Critical Water Supply Arrangements
- using hydrological assessment, the probability of utilisation of the scheme storages under conditions of relative supply shortage.

The methodology is outlined in Figure 2.2 and involves the following steps:

1. Headworks – the total storage in a water supply scheme is determined and partitioned as shown. The partitioning depends on the size of the storage and the operational rules (including water sharing rules).
2. Utilisation – the driest 15-year period is found in the hydrological model for the corresponding water plan and probabilities are calculated for the storage being in each of these partitions.
3. Headworks x Utilisation = HUF. The final medium priority HUF is calculated by taking both the headworks partition volumes and their utilisation into account.

Figure 2.2: How is the HUF calculated?



SunWater's HUF methodology is consistent with the approach approved by the QCA in 2012. To assist with the QCA's review, HUFs were recently revised and updated for the latest hydrological assessments and water supply arrangements. The revised HUFs are shown in Table 2.2, with Appendix J providing further detail on the revisions.

Table 2.2: Revised medium priority HUFs

Scheme	Original HUF_{mp}	Revised HUF_{mp}
Barker Barambah	76%	72%
Boyne River & Tarong	10%	4%
Bundaberg (SunWater headworks)	82%	62%
Callide Valley	10%	27%
Dawson Valley	70%	61%
Lower Mary River	42%	48%
Nogoa Mackenzie	45%	28%
Pioneer River	44%	38%
Three Moon Creek	60%	61%
Upper Burnett (SunWater headworks)	18%	64%
Upper Condamine	11%	8%

2.2.2 Allocation according to water access entitlement

For distribution schemes, the revenue component allocated to fixed charges is allocated on the basis of water access entitlements. This methodology is also used to allocate 50 per cent of the fixed revenue portion of operations costs for bulk water supply schemes.

There are several different water access entitlements which are explained in Figure 2.3.

Figure 2.3: Common water allocations and who bears the costs[1]

1. In the 2012 decision, the QCA determined that SunWater should bear the costs of surplus distribution losses. Refer to the following section for a further explanation.

In 2012, the QCA allocated revenues using water access entitlement data sourced from the resource operations licence or interim resource operations licence applying at that time, with some adjustments to reflect its view that the costs of surplus distribution loss entitlements should be borne by SunWater and certain water access entitlements should be excluded.

Since that time there have been a number of changes to water access entitlements, particularly as a result of distribution schemes transferring to local management entities. SunWater has sourced 2016/17 water access entitlement data from our system and made adjustments to the allocation of certain water access entitlements for the purposes of cost allocation for pricing, as discussed below. The final water access entitlement data used for modelling purposes is contained in our regulatory model at Appendix F.

Distribution losses

Distribution losses arise from operational factors including pipe leakage, distribution system or balancing storage seepage, evaporation losses from balancing storages and systems losses such as distribution system overflows or releases of water from distribution systems to allow for maintenance. SunWater was granted water allocations for the purpose of 'distribution loss', which account for losses involved in delivering water to customers in the distribution system. As water needs to be stored for this purpose, the charge to distribution customers, per delivered quantity of water, is higher than if there were no distribution losses. Distribution loss water allocations are separate to transmission and operating losses which apply to customers located on stream. These losses are accounted for in the announced allocation calculations.

In its 2012 decision, prices were based on what the QCA considered were the prudent and efficient costs associated with distribution loss water allocations; excluding the costs associated with distribution loss

water allocations held by SunWater that the QCA believed were more than that needed to meet required actual loss releases. Any costs associated with these surplus distribution loss water allocations were absorbed by SunWater and not paid for by distribution system customers. The QCA based its estimates on the maximum actual distribution loss deliveries over the 2002/03 to 2010/11 period (nine years), adjusted for the level of water use in that year.

The approach taken by the QCA does not account for the variability and financial uncertainty of SunWater's operations. For example, there has been a diversification away from crops, such as sugarcane, into horticultural enterprises, such as mangoes, macadamia nuts and citrus, over the past decade. This diversification has led to an altered pattern of use which influences distribution losses. Other influences on SunWater's business include the use of new technologies and climate change, resulting in longer and more severe droughts and storms.

SunWater has reviewed the approach applied by the QCA in the previous decision and proposes to apply the following principles in the next price path period:

- Where a distribution system is considering a transition to Local Management Arrangements (**LMA**), customers will bear the full distribution loss water allocation. This approach was supported by the Burdekin River Irrigation Area Board during consultation in June 2018.
- Where a distribution system has transitioned to LMA (or transitions to LMA during the irrigation review process), all distribution loss water allocations will become entitlements held by customers and will therefore bear an appropriate share of costs.
- Where a distribution system is not transitioning to LMA, distribution losses will be allocated using the same methodology as the QCA adopted in the 2012 decision (updated for maximum actual distribution loss deliveries that would have been required over the 2002/03 to 2016/17 period).

Table 2.3 sets out the distribution loss allocations by distribution system under the QCA's approach in 2012 and our proposed approach for the next price path period.

Table 2.3: Comparison of distribution loss allocations

Distribution system	2012 Irrigation Price Review				Proposed approach[1,2]			
	Customer distribution loss water allocation (ML)		SunWater distribution loss water allocation (ML)		Customer distribution loss water allocation (ML)		SunWater distribution loss water allocation (ML)	
	High Priority	Medium Priority	High Priority	Medium Priority	High Priority	Medium Priority	High Priority	Medium Priority
Bundaberg	12,542	0	3538	25,440	12,542	0	3538	25,440
Burdekin Haughton	16,260	111,739	0	78,738	16,260	190,477	0	0
Emerald	6840	15,219	0	7271	6840	21,857	0	0
Eton	3089	6295	0	0	3089	6295	0	0
Lower Mary River	324	1567	0	3021	324	1567	0	3021
Mareeba-Dimbulah	8000	37,000	0	0	8000	37,000	0	0

1. Reflects 2016/17 data. Any discrepancies in total numbers are due to the use of different data sets.
2. Based on maximum actual distribution loss deliveries over the 2002/03 to 2010/11 period.

Note, the distribution loss water allocations under the proposed approach for Bundaberg and Lower Mary River (which are not transitioning to LMA) have not been updated for maximum actual distribution loss deliveries over the 2002/03 to 2016/17 period in this table or our regulatory model. SunWater was unable

to replicate the QCA's outcomes using our own data due to insufficient detail in the 2012 decision. We do not assign priorities to actual water delivered.

Review distribution loss allocations

In the 2012 review, the QCA recommended that SunWater consider making an application to the Queensland Government to review the status of distribution loss water allocations held by SunWater that are more than that needed to meet required actual loss releases. As noted in Appendix C, this did not proceed due to the LMA review process. Once the outcomes of the LMA review process are known for all distribution systems, SunWater will review our distribution loss water allocations for those distribution systems not transitioning to LMA and develop a strategy on their future treatment.

It should be noted that each catchment has rules for water allocation dealings such as the change of purpose stated in the relevant water management protocol or resource operations plan. In all the catchments with a distribution system, the change in purpose from distribution loss would be an assessed change under the rules stated in the *Water Regulation 2016 (Qld)*.

Adjustments to water access entitlements for modelling purposes

In its 2012 decision, the QCA made several adjustments to water access entitlements. SunWater has applied a number of these adjustments in our regulatory model for the next price path period, as detailed in Table 2.4.

Table 2.4: Adjustments made to water access entitlements

Service contract area	Adjustment
Burdekin Haughton (distribution)	The QCA excluded 110,000 ML of medium priority water access entitlements SunWater holds on behalf of the Townsville Thuringowa Water Supply Joint Board (TTWSJB). The contract under which this volume is reserved is due to expire on 30 June 2020. SunWater and the TTWSJB intend to negotiate a new agreement prior to the expiration of the existing contract.
Bundaberg (distribution)	The QCA included volumes for distribution services provided to Burnett Water Pty Ltd (including water leased to Burnett Water).
Bundaberg (bulk)	The QCA excluded 20,000 ML of high priority and 124,000 of medium priority water access entitlements for Paradise Dam (owned by Burnett Water).
Eton (bulk & distribution)	The QCA added a cost allocation of 700 ML of High-A priority water access entitlements (equivalent to high priority) to the industrial customer segment. Prime Infrastructure (Dalrymple Bay Coal Terminal) holds a 500 ML allocation in the Pioneer Valley water supply scheme which is delivered through the Eton bulk and distribution system. Similarly, BHP Billiton Mitsubishi Alliance (Hay Point Coal Terminal) holds a 200 ML allocation.
Lower Mary River (bulk)	The QCA included 1360 ML of high priority and 2690 ML of medium priority water access entitlements for Teddington Weir (owned by Wide Bay Water). Under the existing resource operations plan, SunWater must transfer water from the Lower Mary River water supply scheme to the Teddington Weir water supply scheme when certain conditions are met.
Upper Burnett	The QCA excluded 20,000 ML of water access entitlements associated with Kirar Weir (owned by Burnett Water).

In addition to the 2012 adjustments, SunWater has also excluded 504 ML of risk priority water access entitlements from the Eton distribution system. These entitlements relate to Mirani Diversion Channel customers who do not use the distribution system.

We have not made adjustments to reflect scheme-specific pricing arrangements the QCA adopted in the 2012 review, such as discounted tariffs for selected tariff groups. SunWater recommends that the QCA

consult with stakeholders on whether these adjustments are still appropriate going forward and the quantum of each adjustment. These adjustments are set out in Table 2.5.

Table 2.5: 2012 Irrigation Price Review adjustments for consultation

Service contract area	QCA 2012 adjustment
Burdekin Haughton (bulk & distribution)	The QCA reduced groundwater allocations by 49%, as 49% of volumes in the groundwater area were deemed to be natural groundwater yields.
Burdekin Haughton (bulk & distribution)	The QCA excluded 360 ML of natural flows to Glady's Lagoon.
Mareeba-Dimbulah (bulk & distribution)	The QCA reduced Walsh River & Supplemented Streams allocations by 40%, as 40% of water delivered to this section was deemed to be sourced from natural stream flows.

Free water allocations

In the past some water access entitlement holders in the Barker Barambah and Burdekin Haughton water supply schemes have been exempt from paying bulk water charges to SunWater. In the 2012 decision, the QCA determined that the costs of providing the free water allocations should be shared across the other customers of the relevant scheme.

Since that time, the Queensland Government has decided to remove the costs of supplying the 185,000 ML of free water allocations from bulk water prices of other irrigators in the Burdekin Haughton water supply scheme. SunWater now supplies 185,000 ML of bulk water to Lower Burdekin Water free of charge and receives a CSO payment from the Queensland Government to recover the costs of supply. We have reflected this new arrangement in our regulatory model.

The legislative requirement[10] to provide 1058 ML of free water allocations to South Burnett Regional Council in the Barker Barambah water supply scheme was repealed under the *Water and Another Regulation Amendment Regulation (No. 1) 2013.*[11] We have therefore assigned the 1058 ML of high priority water access entitlements to urban customers in our regulatory model. This means irrigation customers no longer pay for this water.

2.3 Allocation usage charges based on volumes

Revenues that are allocated to the volumetric charging component require an assumption of usage volumes in order to determine the dollar per megalitre charge.

In the previous review, the QCA expressed a strong preference for a longer term volumetric average, but was unable to apply this methodology to SunWater due to a lack of data. For example, the QCA stated:

> *…use of a longer-term average water use will provide the most meaningful estimate of likely future revenues.*[12]

> *…[t]he Authority would prefer a longer term average of 10 years or more for determining a scheme-wide average water use as a base for determining the variable charge. However, this information was not available for all sectors.*[13]

In applying a short-term average "in the absence of a longer (10+ years) period of relevant data",[14] the QCA made an additional adjustment by excluding the lowest three years of water use from the available

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10 Section 109 of the *Water Regulation 2002 (Qld),* which stated that any condition about payment for the storage and supply of water, in the supply contract between SunWater and South Burnett Regional Council under which interim water allocation 102944 held by the Council is managed, does not apply.

11 See https://www.legislation.qld.gov.au/view/html/asmade/sl-2013-0190#sl-2013-0190.

12 QCA, *Final Report, SunWater Irrigation Price Review: 2012-17, Volume 1*, May 2012, p.412.

13 QCA, p.383.

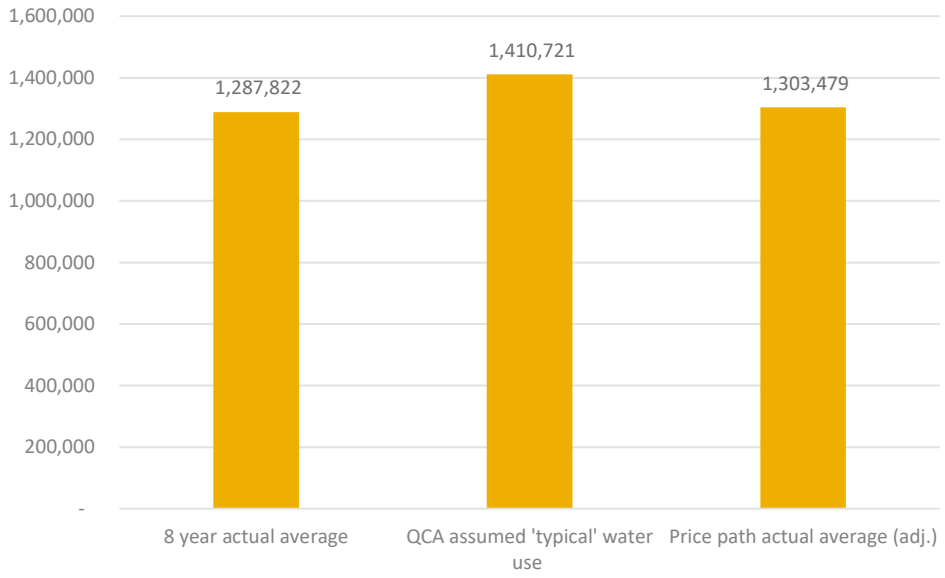
14 Ibid.

eight-year data set. This was to address their concern that an average over a shorter period may over-represent a drought period and result in volumes that are too low on a forecast basis.

While the intention of the QCA was to generate a meaningful water use denominator, this was not reflected in the out-turn results. In fact, the QCA's less preferred approach resulted in a higher forecast usage assumption than what was warranted, as Figure 2.4 indicates, and led to an under-recovery in the revenues allocated to the volumetric charges.

In reality, there is no such thing as 'typical' volume years for SunWater, whose customers experience variability in climatic conditions over time. We discussed some of these challenges in Chapter 1 of our main submission. To suggest that SunWater and our customers experience 'typical' years absent of drought or flood over a five-year period is a mischaracterisation of our operating environment.

Figure 2.4: Comparison of total water use, all service contract areas containing irrigation customers (ML)



1. The eight-year actual average is based on data provided to the QCA for the 2012 irrigation price review for the 2002/03 to 2009/10 period. It excludes water deliveries to Burnett Water in the Bundaberg bulk water supply scheme and Upper Burnett, and free water allocations in the Burdekin Haughton bulk water supply scheme.
2. The QCA assumed 'typical' water use reflects the forecast expected usage underpinning volumetric charges for the 2012/13 to 2016/17 period. An explanation of the QCA's approach is available in its 2012 decision.
3. The price path actual average has been sourced from SunWater's Orion system for the 2012/13 to 2016/17 period. Minimal adjustments have been made to reflect chargeable usage for irrigation prices. For example, the data excludes water deliveries to Burnett Water in the Bundaberg bulk water supply scheme and Upper Burnett, free water allocations in the Burdekin Haughton bulk water supply scheme and natural flows in some schemes.

For the next price path period, SunWater recommends a 15-year average with no removal of 'abnormal' observations to determine the volumetric charges. The use of a long-term average to forecast usage volumes is consistent with QCA's preferred approach to estimating volumes and the Independent Pricing and Regulatory Tribunal's 2017 decision for WaterNSW which applied either a 20-year moving average, 20-year average or 12-year average of actual, historical usage (depending on the region).[15] The forecast usage volumes for each service contract area, using average usage over 2002/03 to 2016/17, is shown in Table 2.6. Historical usage data used to calculate the 15-year average for each scheme is contained in the Addendums to the 2019 Network Service Plans at Appendix D.

[15] See https://www.ipart.nsw.gov.au/files/sharedassets/website/shared-files/investigation-legislative-requirements-water-bulk-water-review-of-prices-for-waternsws-rural-bulk-water-services-from-1-july-2017-formerly-state-water-corporation/final-report-waternsw-review-of-prices-for-rural-bulk-water-services-from-1-july-2017-june-2017.pdf.

Table 2.6: 15-year average water use by service contract area[1]

Service contract area	15-year average water use (ML)
Water supply scheme (bulk plus distribution)	
Barker Barambah	13,121
Bowen Broken Rivers	15,046
Boyne River & Tarong	21,550
Bundaberg[2]	104,230
Burdekin Haughton	598,800
Callide Valley	11,225
Chinchilla Weir	2202
Cunnamulla	1595
Dawson Valley	35,227
Eton	24,806
Lower Fitzroy	18,808
Lower Mary River	9540
Macintyre Brook	16,042
Maranoa River	28
Mareeba-Dimbulah	132,817
Nogoa Mackenzie	163,426
Pioneer River	26,205
Proserpine River	27,001
St George	71,163
Three Moon Creek	5653
Upper Burnett[2]	15,080
Upper Condamine	15,214
Total	**1,328,777**
Distribution systems only	
Bundaberg	90,265
Burdekin Haughton	354,227
Eton	24,741
Lower Mary River	6311
Mareeba-Dimbulah	125,625
Nogoa Mackenzie (Emerald)	80,306
Total	**681,476**

1. Totals may not add due to rounding.
2. Excludes water deliveries to Burnett Water.

2.4 Special arrangements to address volatility in electricity prices

Our submission noted the volatility of electricity prices and their impact on customers in the previous and future periods. In our conversation with customer representatives, electricity prices were a big concern. Given the volatility in prices, the ability for SunWater (and the QCA) to accurately forecast electricity costs underlying customer charges for water is particularly challenging. This is because:

- The current wholesale market is subject to high volatility in prices.
- Electricity network charges will go through a separate regulatory review and will likely change during the period.
- The QCA is transitioning some legacy and obsolete regulated retail electricity tariffs to more cost-reflective tariffs and the impact of this will vary widely between service contracts and within service contracts.
- There is the potential for future SunWater or customer investments in renewable energy solutions to reduce electricity costs.

In the current environment, there is significant risk in the ability to properly forecast electricity costs moving forward. Because of this, some customer representatives have suggested to us that the QCA should investigate mechanisms which recognise the expected volatility in costs over the period to ensure customers pay no more or less than what SunWater actually incurs. Given the uncertainty, customers may prefer to trade-off ex-ante incentives to improve the efficiency for some protection should electricity prices fall below what was forecast.

SunWater supports this approach and has been developing possible models which would allow for an effective 'true-up' for differences between forecast and actual electricity prices.

2.4.1 Engagement with customer representatives

To deliver this outcome for customers, SunWater proposed the following arrangements to the Queensland Farmers' Federation (**QFF**) for an electricity true-up during the next price path period:

- Electricity costs to be fully allocated to the volumetric component of the irrigation charge.
- The QCA recommendation for irrigation prices to include a transparent electricity cost per megalitre in each year of the price path period for each service contract.
- The QCA recommendation to include a requirement for SunWater to report to the QCA actual electricity costs for each service contract area, reconciled to audited annual reports in each financial year. This report would be due no later than 31 December of the year the financial year ends.
- The QCA recommended Part B and D prices for the Minister in 2022/23 include an adjustment factor representing the difference between:
  - the actual electricity costs for 2020/21 in each service contract reconciled to financial year actuals divided by the forecast megalitres used by the QCA in 2020/21 to establish the volumetric charge for each service contract area
  - the forecast electricity costs in 2020/21 divided by the forecast megalitres used by the QCA in 2020/21 to establish the volumetric charge for each service contract area.
- The QCA recommended Part B and D prices for the Minister in 2023/24 include an adjustment factor representing the difference between:
  - the actual electricity costs for 2021/22 in each service contract reconciled to financial year actuals divided by the forecast megalitres used by the QCA in 2021/22 to establish the volumetric charge for each service contract area
  - the forecast electricity costs in 2021/22 divided by the forecast megalitres used by the QCA in 2021/22 to establish the volumetric charge for each service contract area.

The mechanism would work in the following way:

1. The QCA recommends a Part B price for Service Contract Area X which includes the following volumetric charges:

Table 6.4: Example of electricity true-up mechanism for QCA assumed forecasts

Service Contract Area X	2020/21	2021/22	2022/23	2023/24
Volumetric charge per ML	$10.00	$10.00	$10.00	$10.00
Forecast electricity costs	$10,000	$10,000	$10,000	$10,000
Forecast ML	10,000	10,000	10,000	10,000

2. SunWater reports to the QCA in December 2021 that electricity costs in Service Contract Area X were only $9000 for 2020/21.
3. The volumetric charge for 2022/23 would be calculated as follows:

   QCA forecast volumetric charge + (difference between actual electricity costs in 2020/21 and forecast electricity costs in 2020/21 divided by forecast volumes in 2020/21)

   In this case it would be $10.00 +([$9000-$10,000]/10,000) = $9.90. A reduction of $0.10 per ML.

In response, QFF expressed a willingness to explore options further, with the aim to review options that ensure customers are not worse off/better off purely because of adverse movements in electricity prices compared to what is forecast. However, QFF was keen to ensure the arrangement be tested against different schemes. QFF noted, for instance, in low water use years Eton's cost per megalitre for water delivered is double the cost per megalitre in higher water use years. Under the proposed true-up mechanism, QFF was concerned that applying the true-up to the volume charge would mean water users using most of the allocation will bear a greater proportion of the true-up adjustment compared to those who do not.

There was a recognition that all options will have imperfections. However, there was a genuine interest in exploring mechanisms further using sample schemes to model different options. SunWater will look at exploring this and other options further using case studies from both Eton and Burdekin Haughton.

2.4.2 Ensuring SunWater invests for future savings

SunWater has employed a dedicated resource to implement an energy strategy with the objectives of reducing costs and using energy more efficiently. The work programs which underpin the strategy are focused on three areas:

- energy costs
- sustainable energy culture
- energy efficiency.

Work programs such as demand management, tariff optimisation, market contracting, strategic procurement approach, installation of renewable generation sources and embedding an energy savings culture are planned. The energy strategy is being reviewed with a target date of 21 December 2018 to receive management approval and finalisation. The strategy can be shared with the QCA at that time.

To be effective, the true-up mechanism would have to offer something firmer to customers to ensure SunWater is also incentivised to deliver lower costs for electricity through this action plan where it can. This can be achieved by requiring the QCA to incorporate any expenditure which delivers lower electricity cost outcomes to customers as an adjustment to the annuity in the next irrigation price review. This would ensure that SunWater can be compensated for the costs of investing in renewables or other new and emerging technologies required to achieve reductions in electricity costs.

3. Addressing 2012 pricing issues

In its 2012 Irrigation Price Review, the QCA highlighted a number of pricing-related issues that it considered should be addressed for the next price path period. Table 3.1 provides a summary of these issues, how we have progressed them and the extent to which they are reflected in our submission. Further information is contained in Appendix C.

Table 3.1: Implementation of 2012 pricing issues

Scheme	Issue	SunWater implementation and position
Burdekin Haughton	Investigate the hydrological circumstances of the Giru Benefited Groundwater area to confirm the current allocation, or negotiate alternative arrangements with irrigators.	SunWater funded an independent review of the Giru Benefited Area in 2017/18 (see Appendix K). In light of this report, it may be appropriate for the QCA to review the 49% discount currently provided to these customers. SunWater considers that any price increases should be subject to a transition path to manage the impact on customers. As noted above, SunWater believes the QCA should consult with stakeholders on the appropriate adjustment. In the meantime, we have included the full groundwater allocations in our regulatory model.
Burdekin Haughton	Investigate the hydrological circumstances of the Glady's Lagoon area to confirm the current allocation, or negotiate alternative arrangements with irrigators.	Pending budget approval, SunWater expects to investigate groundwater recharge from Glady's Lagoon in 2019/20. This pondage test will also deliver a reasonable estimate of recharge from rainfall and overland flow that contributes to yield from the lagoon. We will provide this information to the QCA should it become available. As noted above, SunWater believes the QCA should consult with stakeholders on the appropriate adjustment. In the meantime, we have included the full Glady's Lagoon allocations in our regulatory model.
Burdekin Haughton	Allocate a share of channel costs to the Townsville Thuringowa Water Supply Joint Board (TTWSJB), if a portion of the 110,000 ML of medium priority water access entitlements SunWater holds on their behalf are taken up.	There has been no firm commitment from the TTWSJB to take up a specific portion of the reserve allocation. Our regulatory model therefore apportions bulk costs only to the reserve allocation (consistent with the QCA's approach in 2012).
Mareeba-Dimbulah	Investigate the hydrology circumstances of the supplemented streams and Walsh River.	Pending budget approval, SunWater expects to undertake a hydrological assessment as part of our business case for Nullinga Dam. This assessment will identify the percentage of water that is delivered to these customers by natural stream flows. We will provide this information to the QCA should it become available.

Scheme	Issue	SunWater implementation and position
		As noted above, SunWater believes the QCA should consult with stakeholders on the appropriate adjustment. In the meantime, we have included the full Walsh River & Supplemented Streams allocations in our regulatory model.