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15 February 2019

Dear Mr Owens,

Thank you for the opportunity to provide a further response on the SA Water Pricing Inquiry in line with the release of "A Cautious Conclusion".

As you know, SACOSS has engaged with this Inquiry since its inception. We are extremely supportive of the Inquiry as we believe it is appropriate for the Government to ensure due diligence on the reasonableness of the opening value of SA Water's regulated asset base (RAB) established by the Second Pricing Order in May 2013.

In line with our support for the Inquiry, we have attempted to help ensure that the Inquiry had access to a wide range of expert opinion and analysis on the matters at hand. Early in the course of the Inquiry, we provided to the Inquiry a copy of a report by Bruce Mountain that we had commissioned in October 2015 reporting on SA Water's profits and asset values. By way of follow up to this, we again commissioned Bruce Mountain in November 2018, to respond to the Inquiry's findings to date and provide some follow up response. SACOSS also made a formal submission to the Inquiry around this time, outlining our formative views on the "Exploratory Essay" and "Diving Deeper".

SACOSS also has a role to play in advising the Department of Human Services about potential projects for Consumer Advocacy and Research Fund allocations each year. We advised the Department to fund Business SA to undertake its own analysis for the Water Pricing Inquiry, in line with our view that it is appropriate for the Inquiry to have available to it a wide range of expert opinion.

It is fair to say that at each stage of the Inquiry, SACOSS has maintained an open mind with respect to the analysis which has been presented. At the release of "A Cautious Conclusion" we identified additional requirements for expert opinion, and commissioned Ian McAuley and the South Australian Centre for Economic Studies (SACES) to provide this. Combined with the findings in "A Cautious Conclusion", this opinion has deepened our understanding on the matters at hand, and caused us to revise some of our initial thinking during the earlier course of the Inquiry. We attach the McAuley and SACES reports as Appendices to this submission.

At the outset, it is vital that SACOSS makes clear its opinion on the context of the Second Pricing Order issued in mid May 2013. As noted in the Exploratory Essay, *"the apparent holding off on making a decision on the RAB until the last moment (which could be construed as a means of simply adjusting RAB upwards as WACC fell), could be of interest to the Inquiry as this could be a departure*

from the previous reliance on WDV for justifying the level of the RAB and may reflect the use of monopoly power.”¹

SACOSS supports the finding of the Inquiry that this decision was unreasonable. In particular, SACOSS believes this view was not fair in line with the comments made by the Inquiry about the interests of consumers. In this context, the Inquiry has stated that *“this decision was not able to be taken under the NWI Pricing Principles as it represented a switch from the previous arrangements which set a RAB value based on an ODV using a DORC asset valuation, to an economic valuation in 2013 based on targeted revenue (or price). Even if this view is disputed, the decision clearly fails the reasonableness test of sensible, fair and moderate. It wasn’t sensible because it went against all previous decisions using the DORC and was inconsistent with DTF’s own roll-forward modelling; it wasn’t fair because the benefit of the falling WACC should have gone to consumers who had incurred price increases for each of the previous 4 years of over 20%pa; and it wasn’t moderate as it claimed all of the benefit for the Government and locked this benefit in for ever year going forward through a higher RAB.”²*

Given that the decision was unreasonable, the question of what an appropriate remedy is becomes paramount. While we appreciate the careful consideration of this matter by the Inquiry, SACOSS is mindful of the views of our consultant Ian McAuley and we draw the Inquiry’s attention to that report. In particular, SACOSS believes there are four significant areas which call for further attention by the Inquiry:

- Recalculating a 30 June 2013 RAB and treatment of Indexation
- Treatment of contributed assets
- Circularity of economic valuation
- Use of deprival value

Recalculating a 30 June 2013 RAB and Treatment of Indexation

In recalculating a 30 June 2013 RAB, SACOSS notes that the Inquiry has used a base case model and reflected actual CPI. SACOSS is concerned that the use of CPI most likely understates the rise. According to McAuley (2019):

“But as a technical point it is useful to dwell on the use of indexes for bringing forward asset values from 2004 to 2013, because there is a degree of discussion of the appropriate index – the CPI or a producer cost index as used by the Essential Services Commission. The brief answer is that the CPI probably understates the rise. The rises in index numbers between 2004 and 2013 (June quarters) were:

CPI Australia	27.5 per cent
CPI Adelaide	26.4 per cent
Non-residential construction national	27.7 per cent
Non-residential construction SA	33.0 per cent

The use of CPI probably results in an understatement of the RAB in the spreadsheet models used for updating the RAB. Over the period 2004 to 2013 construction costs rose faster in SA than nationally. The ABS indices suggest that SA was starting from a low base. The Diving Deeper paper (P 10) gives no reason for using the CPI.

¹ Owens, L. (2018) “Exploratory Essay”: p.21

² Owens’, L. (2018) “A Cautious Conclusion”: p.50

Although the CPI is commonly used as a measure of inflation, it is actually an indicator of household cost-of-living expenses, which may be subject to changes in government policies and which reflect patterns of household expenditure which differ from expenditure in the economy as a whole. Although in the very long run, most index numbers tend to converge, over a period of a few years choice of an appropriate index number is important. (In fact, a well-managed business such as SA Water may have its own “in house” index numbers, based on prices paid.)³

SACOSS recommends that the Inquiry model the use of different indexes.

Treatment of contributed assets

SACOSS has reconsidered the treatment of contributed assets and agrees with McAuley (2019) that the reasons for exclusion are unconvincing. SACOSS agrees with McAuley (2019) that sinking fund contributions should be treated as any other part of the RAB. In this light, SACOSS considers that there should be some allowance for contributed assets and that this is a matter for further investigation by the Inquiry.

Circularity of economic valuation

SACOSS concurs with McAuley (2019) that the economic valuation approach applied to SA Water is entirely self-referential. To quote:

“But even though it is corporatised, SA Water is not the beneficial owner of the water supply system. One could argue that the government, as the shareholder, is the beneficial owner, but unlike the private shareholder in a public company the government’s objective is unlikely to be to maximize the return on their shares. That is, unless it is using profits from GBEs as a means of raising taxes through surreptitious means. Indeed, the South Australian Government seems to have said explicitly that in its desire to reduce the RAB it is content to reduce its dividend....

But in none of the documents is there any evidence that the price of water has been set by a market or quasi-market method. This means that any RAB derived by calculating the net present value of revenue is simply a reflection of the price. That is, entirely self-referential.”

Use of deprival value

The *Cautious Conclusion* paper states that the deprival value of an asset “is based on the notion that the value of an asset is equivalent to what the owner would lose if they were deprived of the asset”.⁴

As McAuley (2019) points out, calculating the deprival value of a financial asset is simply a question of calculating the NPV of future benefits to the owner. That means it is the same as what the paper refers to as the “economic value”.

However, that way of calculating deprival value is relevant only in reference to the standpoint of the beneficial owner of the asset, and when those benefits are in the form of financial benefits. As stated above, SA Water is not the beneficial owner of the assets. It is not a profit-maximising entity. If a corporate metaphor must be used, its shareholders are the people of South Australia, and their dividends are in terms of the surplus value of the benefits of a water supply. It is possible that from such a base perhaps a deprival value could be calculated. But, as McAuley (2019) explains, “the idea of a city without reticulated water is beyond imagination”.⁵ Perhaps a first-order deprival value could

³ McAuley, I. (2019) “Initial Comments on SA Water Pricing”: p.7

⁴ Owens, L. (2018) “A Cautious Conclusion”: p.16

⁵ McAuley, I. (2019) op cit: p.9

be obtained from a thorough benefit-cost analysis, as suggested in McAuley (2019) – indeed there may be value in such an exercise. But, with no such proposal on the table, the idea of a deprival value is of no practical relevance to this inquiry.

Impact on SA Government revenue

A Cautious Conclusion states that the *“In theory there is a “correct” RAB, but in reality it is difficult to claim that any single number is absolutely correct.”*⁶ As outlined by McAuley (2019), the *“idea that there may be a theoretically “correct” RAB may be a stretch of the meaning of “correct”. The future availability of water and therefore the capital required to harvest and treat it is highly uncertain, particularly in a dry state such as South Australia, and climate also has an influence on water. Even in a world where future climate could be predicted, there are intrinsic difficulties in valuation as explained above. But the caution against reliance on a single number is correct, and a more general conclusion may be that the whole quest in this inquiry is futile.”*⁷

Given the uncertainties around the valuation of the RAB, SACOSS is extremely cautious about how to “correct” for the 2013 decision. Our submission posits that it would only be possible for SACOSS to support a reversion to a DORC valuation rather than an economic valuation and removal of some contributed assets whilst allowing for a sinking fund. SACOSS has asked SACES to model the impact of these scenarios on SA Government revenue and refers the Inquiry to the modelling in the SACES (2019) report attached to this submission. SACOSS recommends that the Inquiry does its own modelling of the impact on SA Government revenue and report on this. SACOSS believes this is in line with the Inquiry terms of reference.

Given the estimates modelled by SACES, SACOSS supports a revenue measure which would replace the lost revenue from the RAB revaluation. SACES (2019) has outlined that around \$30 million of revenue could be accrued from a change in the way in which aggregation of land tax holdings is treated to match the approach followed in NSW and Victoria. SACOSS supports this land tax revenue measure and commends it to the Government for consideration in the context of the Inquiry.

SACOSS also supports consideration by the Government of the measure proposed by McAuley (2019) to improve equity without manipulating the RAB: abolishing the supply charge and absorbing the impact of this by higher usage charges.

We thank you in advance for consideration of our submission. If you have any questions relating to the above, please contact SACOSS Senior Policy Officer, Jo De Silva on (08) 8305 4211 or via jo@sacoss.org.au.

Yours sincerely,



Ross Womersley
Chief Executive Officer

⁶ Owens, L. (2018) “A Cautious Conclusion”: p.24

⁷ McAuley, I. (2019) op cit: p.11

Initial comments on SA Water pricing, February 2019

Ian McAuley

These comments, prepared for SACOSS, are an initial response to the three papers¹ prepared for the inquiry into water pricing in South Australia and the submission to that inquiry by Business SA.

The problem (or political opportunity) faced by the SA Government

As pointed out in the *Exploratory Essay*, between 2004 and 2013 there were steep nominal and real price rises in domestic water prices, particularly from 2008-09, when, in the face of drought and concerns about water supply security, the state government undertook major investment in water assets.

The major new assets were a desalination plant and an interconnection between Adelaide's northern and southern water networks. In line with national competition guidelines and National Water Initiative (NWI) principles, such expansion was to be funded from higher water charges.

At the same time as the price rises, the government introduced strong water use restrictions. The combination of price rises and water restrictions resulted in a reduction in average consumption. (Water restrictions were probably the proximate cause, because price and income elasticity effects take time to take hold.) Water supply is essentially a fixed-cost industry – a reduction in usage having very little effect on operating costs – which means that a reduction in demand has to be met with an increase in price, if the industry is to continue operating in the future. This is one (but not the only) departure from textbook models of supply, demand and price. So, because of this positive feedback effect, any price rise had to be greater than one based on a continuation of consumption at established levels.

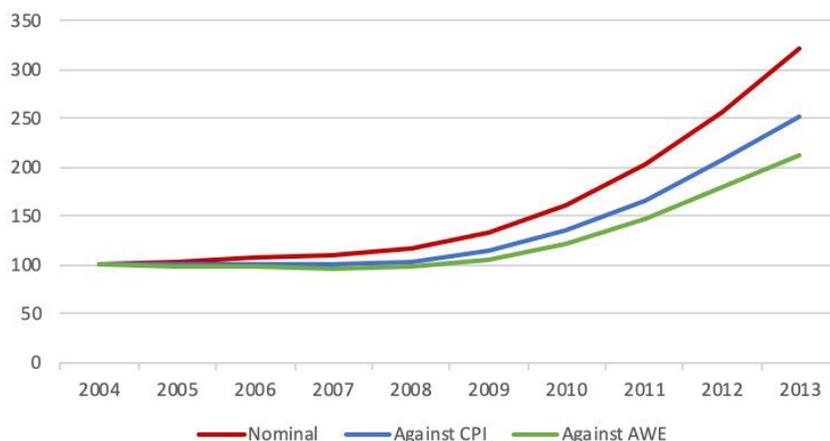
Also, a point to be covered further on, once consumers adjust to lower consumption (induced either by price rises or restrictions), when (or if) subsequently prices fall or restrictions are lifted, they are unlikely to revert to previous levels of consumption. They don't re-plant water-hungry gardens, re-install high-flow shower roses, or re-install single flush lavatory cisterns. In economists' terms, demand may be far more price inelastic in response to price falls than price rises: there is a degree of hysteresis in the demand function.

The cumulative effect of the 2004 to 2013 price rises is shown in Figure 1.² Over that period, while nominal prices rose by 220 per cent, real prices as adjusted by the CPI rose by 150 per cent, and as adjusted by average weekly earnings they rose by 110 per cent.

¹ "Exploratory Essay: Setting the initial water RAB for SA Water", August 2018; "Diving deeper: Inquiry into water pricing in SA", September 2018; "A cautious conclusion: Inquiry into water pricing in SA", December 2018.

² This is derived from the Table on Page 6 of the "Essay", and ABS data on the CPI and average weekly earnings (Full-time adult ordinary time earnings).

Figure 1. Average price of water SA, base 2004 = 100



It should be noted that this data refers to *price* rises. It does not take into account *expenditure* on water. (When referring to utilities, politicians and journalists often confuse the two.) While it is not possible to find a robust time series, it is clear that there has been a significant demand response. According to the ABS, using spot data:

Between 2003-04 and 2005-06, the average daily consumption of water by households stayed around 640 L, followed by a slight increase to 660 L in 2006-7. However, in 2007-08, after the introduction of Level 3 Enhanced Water Restrictions (1 January 2007), water consumption fell markedly to 523 L and remained at this generally lower level in 2009-10.³

Later data from the ABS suggests that household water consumption in South Australia has remained at a lower level – an average of 510 liters per day.⁴ That is a fall of 20 per cent (from 640 to 510 liters). Therefore the rise in a household's bill would have been 100 per cent ($2.5 \times 0.8 - 1$), when indexed by the CPI or 70 per cent when indexed by average earnings. In terms of impact on most households an earnings index is probably a more appropriate indicator than CPI, even for age pension households because the age pension is indexed to earnings, but CPI may be a more fitting index for some other households.

Those with partisan motivations may be inclined to overstate the burden on households, citing a (nominal) trebling of price rises, but even a more considered figure points to a doubling of the burden of water bills. People may feel particularly resentful that even after they have responsibly complied with water restrictions, they have been hit with price rises. Governments throughout Australia have done a poor job in explaining the need to invest in water and electricity assets and to pay for those investments through higher prices.

³ ABS SA Stats, *Feature Article: Household water consumption and conservation actions*, Cat 1345.4, January 2011.

⁴ See ABS 4610.0, *Water Account Australia, 2015-16*. SA water consumption per household has remained low, between 174 Kl and 199 Kl per year, averaging 187 Kl, or 511 liters per day, from 2008-09 to 2015-16. The SA Essential Services Commission uses a figure of 190 Kl a year for planning.

How the government seeks to reduce prices

If the government is concerned with the equity effects of these price rises, then, disregarding legal, regulatory and political constraints, it could reduce prices by administrative fiat, it could ease the burden of bills through identified payments to those suffering stress from utility bills (either through community service obligations on SA Water or specific payments from the government), or it could make higher payments through its social security programs (although state governments play only a limited role in making transfer payments).

In practice, however, the government is constrained to operate within the framework of the NWI, and certain Commonwealth payments are conditional on strict compliance with this framework. In essence, it must set prices that cover the cost of water supply, including a return on capital. Therefore the government seems to be mounting a case that the cost of water supply is overstated, and that because (supposedly) operating costs are about as low as they can be, any overstatement lies in the capital costs, and this is a capital-intensive industry.⁵

That means the government's focus is on the capital base of the industry, the regulated asset base (RAB). If it can be argued that the RAB is too high, then it follows by formula that the return on capital can be lower and therefore the price of water can be lower.

To this end the government has an inquiry process using a "fair value" method, which can be estimated using either an income approach (i.e. what is the present value from income these assets will generate), or a replacement cost approach.

In any utility as old as SA Water, it is impossible to assess every asset purchase over history; therefore a "line in the sand" must be drawn. The models in the government's inquiry accept, with qualifications, the RAB value of July 2004 as a starting value, with certain qualifications – notably in most models the exclusion of "contributed" assets, these being assets funded in the first instance by property developers.

The inquiry points to a 2013 determination by the SA Treasury, valuing the RAB at \$7.77 billion as at December 2012, and it considers other methods for valuing the RAB based on historical accounts.

Using the 2004 RAB as a starting point, apportioning assets between water and sewerage, including an allowance for inflation (CPI), adding in capital expenditure at book value, and applying a depreciation rate of two per cent, the inquiry calculates a value of the RAB of \$7 261 million as at December 2012, a \$509 million reduction in the RAB.

Other methods, involving different ways of calculating the value of contributed assets and legacy assets, and different indexation rates, result in different calculations of the December 2012 RAB. These involve reductions between \$421 million and \$1071 million.

⁵ Out of SA Water's \$1 295 million expenses in 2018, \$367 million was for depreciation and \$330 million was for borrowing costs, suggesting about 54 per cent of costs were capital related. In addition a dividend of \$139 million was paid to the government. (SA Water *Annual Report*.) According to the Essential Services Commission of SA, the return on capital accounts for 70 per cent of SA Water's revenue cap.

To put these figures into perspective they involve a reduction of between 5.5 and 13.8 per cent of the water RAB. In terms of dividend and income tax equivalent revenue to the government, based on SA Water's 2017-18 dividend and income tax equivalent contribution of \$200 million⁶, and apportioning that 75 per cent to water, that would represent a reduction of between \$8 million and \$21 million in government dividends. These may be underestimates of the reduction, for the dividends would have to be paid from retained earnings after interest is paid. The June 2018 book value of equity in SA Water is \$5.5 billion, which means the equity value would fall between 7.6 per cent and 19.4 per cent, with dividends falling between \$11 and \$29 million.

In the context of the South Australian government's revenue these are not large amounts. The South Australian Government operates on a cash-balanced budget of around \$20 billion. At the upper end of estimates of forgone revenue the loss would be 0.15 percent of revenue.

If, however, the South Australian Government seeks to offset any loss of revenue from SA Water by reducing budgetary outlays for SA Water for non-commercial activities (community service obligations), as would be the case if the government were committed to tight portfolio budgeting – then it may seek savings in appropriations for those CSOs, which come to \$67 million for “drinking water retail services” in the current year.⁷ These payments seem to be mainly directed to subsidizing non-metropolitan services in order to maintain retail prices at Adelaide levels. (They are not broken down any further in budget documents.)

This means that valuation of the RAB could be a significant issue in terms of consumer welfare. But what is involved in valuing an asset?

Valuation – the elusive quest for firm figures

Socrates, Aquinas, Ricardo, Marx and Polanyi have been among philosophers grappling with the concept of “value”. Although figures can be produced with great precision, the assumption behind any such figures are somewhat arbitrary and are rarely articulated. “Value” is a complex concept, however.

In everyday language “value” is generally about the market price at which things are traded, but this is but one of many possible concepts of value.

In this exercise the government may be seeking some market value – either for water or for the inputs to water supply – and the documents suggest that there is a search for a stable valuation, particularly in relation to “line in the sand references”. But even (or particularly) in competitive markets, market values are anything but stable. For example house prices are volatile, although the intrinsic properties of houses – the services people value in terms of comfort, shelter and convenience – change only very slowly.

⁶ The budgeted dividend and income tax equivalent for 2017-18 is \$201.4 million and the estimate is \$197.7 million. (SA Budget)

⁷ Essential Services Commission of South Australia, SA Water Regulatory Determination 2020: Guidance Paper 2 “SA Water's revenues and prices”, November 2018.

Value, as it relates to human enjoyment, is more stable than and different from value as revealed in markets. Economists refer to the difference between *value in use* and *value in exchange*. This philosophical point may seem to be distant from the problem of establishing a RAB for SA Water, but there is a difference between how we may value the capital inputs and the outputs of a car factory (value in exchange) and how we may value the capital inputs and outputs of a system producing drinking water (value in use). (For water used in commercial or industrial applications, however, value in exchange would be more fitting.)

More basically, as economists point out, there is generally a degree of “consumer surplus” in any transaction. If I am willing to pay \$3 for a liter of milk, and I can buy it for \$1, I enjoy \$2 of surplus value. That \$3 is the value to me, but you may have a different value for milk. When it comes to water, a necessity for life, the whole concept of value becomes very difficult, rendering concepts such as “deprival value” meaningless, because they would throw up such high figures as to be absolutely useless in determining a RAB for SA Water. (We return to deprival value further on.)

Even if we take market prices as a benchmark, the question arises whether the market in question is competitive. Is there some degree of market power, resulting in producers raising the price above what would prevail in a competitive market, thereby transferring some surplus away from consumers and, to the extent that consumers drop out of the market, incurring some deadweight loss – that is, a forgone opportunity for transactions that could have had some benefit for consumers and producers.

Authorities overseeing or regulating natural monopolies, be they government or privately owned, try to emulate the conditions that would prevail in a competitive market, seeking both operating efficiency and the elimination of deadweight loss. The inquiry papers all refer to the need to avoid monopoly profits.

There are basically two ways they can go about determining what would be a price that would satisfy such conditions. One is by comparison with other places, and the other is by building a model of an efficient operator.

In some situations comparison between jurisdictions can yield policy-useful results. In health care for example, governments often use as a benchmark the unit cost of the lowest-cost service provider, after controlling for quality and scale economies. They don't have to be concerned with how those costs are built up.

But such an approach is less relevant for water and electricity utilities, because costs and therefore prices are geographically dependent. We would expect water to be more expensive to produce in Adelaide than in Hobart. Therefore a “building block” method is more likely to be appropriate. For valuation of assets used in producing water, this means recourse to accounting measures. And in capital-intensive industries that means valuation of the RAB is important.

The two cultures of accounting

Accounting comes in two flavours – *management accounting* and *financial accounting*. Management accounting is concerned with gathering information, in financial terms, for management decision-making. It involves judgement, guesses and imprecision. It's the exercise firms might use when deciding whether to invest in a new product line. Domestically it's the

process we might use when we decide whether to replace our car, or to invest in solar panels. In public administration it's what governments use when undertaking cost-benefit analysis of a new infrastructure project. In all cases answers are (or should be) a range of estimates.

Financial accounting is quite different. It's about external reporting to stakeholders, and it's governed by a set of conventions that are designed to produce consistent results, leaving little room for discretion by those preparing accounts. Terms such as "accurate" or "correct" have specific meanings, generally that they have been prepared in line with accounting conventions and published standards.

As a metaphor, we are probably all familiar with maps prepared according to Mercator's Projection, which treats our spherical planet as a projection from its axis onto a cylinder of paper wrapped around the planet and touching at the equator. We have all seen maps that make Greenland look the same size as continental Africa. They are obviously not "correct" in terms of what we know about Greenland, but they are prepared correctly in line with Mercator's projection. The navigator, using a map prepared according to Mercator's projection, knows it gives a pretty good guide in tropical areas, has to be interpreted with caution in the temperate zone, and is next to useless in the arctic zone.

So it is, or should be, with accounting, but as accounting academics Johnson and Kaplan pointed out, from around the 1960s managers have tended to abandon management accounting and have relied more on financial numbers. "By the 1960s and 1970s, managers commonly relied on the financial managers alone" they write.⁸

One financial accounting convention that's particularly relevant to this situation is the "conservatism" convention, which, as its name suggests, takes a conservative view on asset valuation. Typically assets are valued at historic cost, which means inflation is not taken into account, and from that cost depreciation is deducted.

"Depreciation", in its everyday use, is about the loss of value of an asset (a car for example) through normal use, but in financial accounting it's simply a means of converting the lumpy purchase price of an asset to an expense over a number of years, with implications for a company's reported profit and tax liability. It may or may not relate closely to actual loss of value through wear and tear, but in line with the convention of conservatism, it probably has a bias to under-valuation.

The undervaluation bias arising from conservatism serves us well as lenders or equity holders, but it's not particularly useful in valuing SA Water's RAB. (Most readers probably own cars with a depreciated book value that is much lower than what they would be willing to sell it for on an arm's length transaction.)

As pointed out in the *Cautious Conclusion* paper, in South Australia the RAB has been prepared using statutory (financial) accounting as a base, and making adjustments. This has resulted in a RAB that's been between 80 and 90 percent of the statutory valuation. At first sight this may seem to be anomalous, because we would expect the conservatism convention to reveal a low

⁸ H Thomas Johnson and Robert S Kaplan, *Relevance Lost: The Rise and Fall of Management Accounting*, Harvard University Press, 1987.

base. The paper does not give any insight into this difference. It may result from the exclusion of certain assets from the RAB, for example.

Financial accounting models

The submission by Business SA provides a list of financial accounting asset valuations that may be relevant inputs for setting an initial RAB, or in this exercise, assessing whether the original RAB was “reasonable”. These are:

- historic cost;
- indexed historic cost;
- like-for-like replacement;
- modern equivalent asset value;
- optimized replacement cost;

As we move down the list the values so generated are more likely to overcome some of the undervaluation bias in financial accounting measures: replacement cost measures should overcome most of the conservatism bias.

But as a technical point it is useful to dwell on the use of indexes for bringing forward asset values from 2004 to 2013, because there is a degree of discussion of the appropriate index – the CPI or a producer cost index as used by the Essential Services Commission. The brief answer is that the CPI probably understates the rise. The rises in index numbers between 2004 and 2013 (June quarters) were:

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The use of CPI probably results in an understatement of the RAB in the spreadsheet models used for updating the RAB. Over the period 2004 to 2013 construction costs rose faster in SA than nationally. The ABS indices suggest that SA was starting from a low base. The *Diving Deeper* paper (P 10) gives no reason for using the CPI.

Although the CPI is commonly used as a measure of inflation, it is actually an indicator of household cost-of-living expenses, which may be subject to changes in government policies and which reflect patterns of household expenditure which differ from expenditure in the economy as a whole. Although in the very long run, most index numbers tend to converge, over a period of a few years choice of an appropriate index number is important. (In fact, a well-managed business such as SA Water may have its own “in house” index numbers, based on prices paid.)

⁹ Data calculated from ABS Producer Price Indices, Table 17. The documents do not specify which index has been used by SA Water. ABS 6247.0, supplemented by CPI numbers.

More substantial shortcomings in SA Water accounts relate to specific assets, which may be significantly undervalued. These include:

Water rights. SA Water's annual report lists several long-standing water rights relating to the Murray River, and catchment areas in the Mt Lofty Ranges and elsewhere. They point out "... reliable estimate of a fair value of these water licences cannot be determined because there are no active markets for the rights endorsed on the licences. As there is no active market, these licences are held by the Corporation at nominal value". The difficulty in valuation is indisputable, and a nominal valuation aligns with the conservatism convention of accounting. But these are basic assets, of great value to the SA community. And because catchment reservations involve exclusion of some other uses they come at an opportunity cost. (They also have an external environmental value in terms of conserving land.) What is the opportunity cost of catchment reservations?

Very old assets. Dams, pipes and other infrastructure without moving parts have very long lives, and even low depreciation rates, such as two percent, may significantly undervalue them.

Human capital. Conventionally in SA Water, as in other corporations private and public, human capital is expensed rather than capitalized. But if SA Water's workforce had to be replaced tomorrow, even if a workforce of identical trade and professional qualifications could be recruited, its performance would suffer and costs of a capital nature (even they would not relate to physical assets) would be incurred. Financial accounting still treats labour, in all categories as a fungible commodity, even though "labour" embodies an accumulation of capital (called "human capital") in the form of education, training, industry knowledge, and firm-specific knowledge. Some of the return from human capital accrues to employees, but much accrues to other stakeholders. Accountancy academics and professional bodies recognize this shortcoming.

Deprival value

To quote the paper *A Cautious Conclusion*, the deprival value (DV) of an asset:

is based on the notion that the value of an asset is equivalent to what the owner would lose if they were deprived of the asset, and that an owner can generally use that asset to derive greater value than that which would be obtained from the sale of the asset. (P 16).

This aligns with other definitions of deprival value. But the interpretation of what it means is open to two very different approaches, and the approach used in the inquiry is one that makes little or no sense in the context of setting a RAB for SA Water.

One approach is to take the community's interest as a whole. In such an approach a question can be framed two ways. The question can be put "what would you pay to have a reticulated water supply if you didn't already have one?". Another framing is to ask "what compensation would you seek if the government proposed to withdraw your reticulated water supply?". In pure economic theory the two should reveal the same answer, but because of the endowment effect (we value what we already have) the latter frame tends to reveal a higher figure.

Such an approach can be and is used in benefit-cost analysis, particularly when there are clear tradeoffs between having and not having an asset. What reduction in rates would you seek to compensate for re-zoning a park to commercial development, or conversely, what increase in rates would you accept to have an industrial site re-zoned as a park? These are simple questions in which the alternatives can be imagined.

Closely related is valuation by revealed preferences, using prices revealed in markets as proxies for people's valuation of public assets. Road authorities, in evaluating the community value in bypassing country towns, use increases in real-estate prices in already bypassed towns as proxy inputs for calculating the value of a proposed bypass.

But for an essential service, such as water, the idea of a city without reticulated water is beyond imagination. Perhaps one could get some first-order valuation by looking at the outlays people make in settlements without water, where people dig wells or install rainwater tanks and septic systems, and buy bottled water. Almost certainly such a figure would be more than the \$15 000 value of RAB per customer revealed in *A Cautious Conclusion* (P 30).

But neither that document, nor the substantial document submitted by Business SA, have used that conventional approach to deprival value. Rather, they have used the net present value of benefits flowing to SA Water, an approach often called an "economic valuation". One considers the income stream (the revenue flowing to SA Water) assumes a long time horizon, and applies a discount factor to calculate the net present value.

It is indeed an established method of valuation. In theory the value of a share is the net present value of all future earnings. In valuing pensions for the superannuation assets test the Commonwealth assigns a capital value of 16 times the value of the pension (implicitly assuming a discount rate approaching 6.25 per cent). It's a reasonable approach for a shareholder or a pension holder, who are the beneficial owners of such assets.

But even though it is corporatised, SA Water is *not* the beneficial owner of the water supply system. One could argue that the government, as the shareholder, is the beneficial owner, but unlike the private shareholder in a public company the government's objective is unlikely to be to maximize the return on their shares. That is, unless it is using profits from GBEs as a means of raising taxes through surreptitious means. Indeed, the South Australian Government seems to have said explicitly that in its desire to reduce the RAB it is content to reduce its dividend. (With such a high dividend payout as it is now extracting it could not increase the payout ratio, unless it went to a greater than 100 percent dividend and stripped the company's assets).

Whatever its corporate title, SA Water holds assets in trust for the people of South Australia. For financial accounting purposes it has to prepare financial statements resembling those prepared by other corporations, public or private, but there the comparison ends. While Wesfarmers can decide to sell its Coles stores, SA Water is not at liberty to dispose of its main assets. Freedom to dispose of assets is one of the main tests of "ownership".

In the highly theoretical situation (discussed above), where the price of water had been set by some quasi-market situation that revealed people's willingness to pay, then such a backward calculation could make some sense, subject to assumptions on four variables – future weather patterns, population growth, the time frame and a realistic discount rate.

All four variables are sensitive, and the variable with most uncertainty is the pattern of future weather: climate change models point to a drier and hotter future but without precision. The main known sensitivity is the discount rate, and it is arguable that the capital constraints governments have imposed on themselves have resulted in a government discount rate, typically seven per cent nominal, that is way out of step with governments' costs of borrowing after applying a risk premium. The Grattan Institute, for example, suggests a discount rate of half this value for low-risk projects.¹⁰ Water supply is mature both in terms of markets and technologies, so would easily qualify as low-risk. For an asset yielding benefits into the indefinite future, a halving of the discount rate doubles its net present value.¹¹

In other words, it is probable that this method, even if based on a reasonable estimate of prices, probably significantly understates the value of the RAB.

But in none of the documents is there any evidence that the price of water has been set by a market or quasi-market method. This means that any RAB derived by calculating the net present value of revenue is simply a reflection of the price. That is, entirely self-referential.

Contributed assets

Although there seems to be general agreement that contributed assets should be fully or partially excluded from the RAB, the reasons for exclusion are unconvincing.

There are obvious difficulties in valuing contributed assets, and by the conventions of financial accounting they may not appear on SA Water's balance sheet. It is quite reasonable that the opportunity cost of capital of these assets is not counted as a cost for SA Water. (Those costs are borne mainly by buyers of new homes, one of the unacknowledged wealth transfers from younger to older Australians.)

But once these assets are transferred, liability to maintain them passes to SA Water. Maintenance as such will show up as operating expenditure, and will not form part of the RAB. But sound business practice suggests that SA Water should have a sinking fund to cover future capital costs for their eventual replacement. The present value of such sinking fund contributions should surely be treated as any other part of the RAB. The value may not be high, because these are likely to be long-life static assets, but it is hard to mount a case for their exclusion.

Why bother trying?

It's hard to gather just what the South Australian Government is trying to do.

The paper *A Cautious Conclusion* outlines an approach to setting a RAB which would seem to align with National Competition Policy and the specific provisions of the NWI:

¹⁰ Marion Terrill and Hugh Batrouney, "Unfreezing Discount Rates: Transport infrastructure for tomorrow", Grattan Institute February 2018.

¹¹ The limiting case of NPV calculated over a very long period is $NPV = \text{Income stream} / \text{Discount rate}$.

... the RAB should be set at a value that leads to a revenue stream or price which provides sufficient incentive to the service provider to maintain and invest in the asset, while avoiding monopoly prices.

That sets a clear direction of causality – the revenue stream should be adequate to go on providing the service.

It then goes on to state:

In theory there is a “correct” RAB, but in reality it is difficult to claim any single number as absolutely correct.

The idea that there may be a theoretically “correct” RAB may be a stretch of the meaning of “correct”. The future availability of water and therefore the capital required to harvest and treat it is highly uncertain, particularly in a dry state such as South Australia, and climate also has an influence on the demand for water. Even in a world where future climate could be predicted, there are intrinsic difficulties in valuation as explained above. But the caution against reliance on a single number is correct, and a more general conclusion may be that the whole quest in this inquiry is futile.

That leads to a frank statement in the same paper:

the RAB is better seen as a politico-economic construct used by governments and regulators to set the allowable revenue or prices for services delivered by a regulated business.

The government’s approach seems to be at variance with principles established in monopoly regulation. The approach to utility regulation, adopted by governments of various ideological persuasions, in Australia and in similar countries, has been to try to set a value of assets that relates as closely as possible to the properties of those assets themselves, disregarding the vagaries of valuations based on arbitrary assumptions (such as those used in financial accounting), and making sure that only assets relevant to producing the required output are counted. That’s the whole point of establishing a RAB. But the government seems to be going against that principle, implying that the RAB valuation is simply a convenience to provide a formulaic justification for a pricing decision.

In setting a very high dividend payout ratio on SA Water (95 per cent), the government seems, *de facto*, to have already judged that SA water is over-capitalized. Depreciation and a five percent retention rate may provide enough funds to sustain the current real level of assets, but SA is growing, and it’s almost certain that the future is one of a higher marginal cost of providing water.

The papers prepared for the enquiry seem to be unduly focused on financial aspects of the RAB, while avoiding the more basic question of whether SA Water is under- or over-capitalized. Is the desalination plant a stranded asset? Has there been an economic analysis of the tradeoff between regulatory restrictions (water restrictions) compared to providing extra capacity?

In fact the Cautious Conclusion paper points to the vagueness of the exercise, and its lack of relationship to SA Water’s real assets, where it writes:

It does not require the Inquiry to determine a new RAB, simply to form an opinion as to whether the value of the Initial RAB and the process to establish it were reasonable.

“Reasonable” is a word with many shades of meaning.

What then is a reasonable RAB?

The papers seem to duck the most difficult question of the criteria for a RAB.

In a world with a high degree of certainty it may be possible to apply a formulaic approach to establish a proper level of capital investment. Using 183 years of rainfall and river flow data (going back to 1836), it would be possible to develop neat Gaussian distributions of data, as inputs into a supply and demand model. Using such distributions the government could specify a RAB as that which would provide adequate capacity for, say, nine out of ten summers, without the need to impose restrictions.

Climate change has put paid to any such deterministic planning. Planners have to move from models based on statistical risk analysis, to models based on uncertainty which cannot be modeled statistically. Even if the Paris emission goals are met, it will be decades before there is anything like a statistically predictable pattern of climate. Simply knowing that in general the climate will be hotter and drier is a crude basis for planning. Some time in the future analysts will look back and judge that the planners in South Australia over-invested or under-invested in water assets, but that's not much help to those who must make decisions in 2019.

It may be that, given this level of uncertainty, planners should shift their thinking away from a model of a firmly fixed investment, to models involving more flexible responses to changes in supply and demand – equivalent, in some aspects, to the way electricity planners are shifting their thinking from “base load” to “despatchability”.

Can the government improve equity without manipulating the RAB?

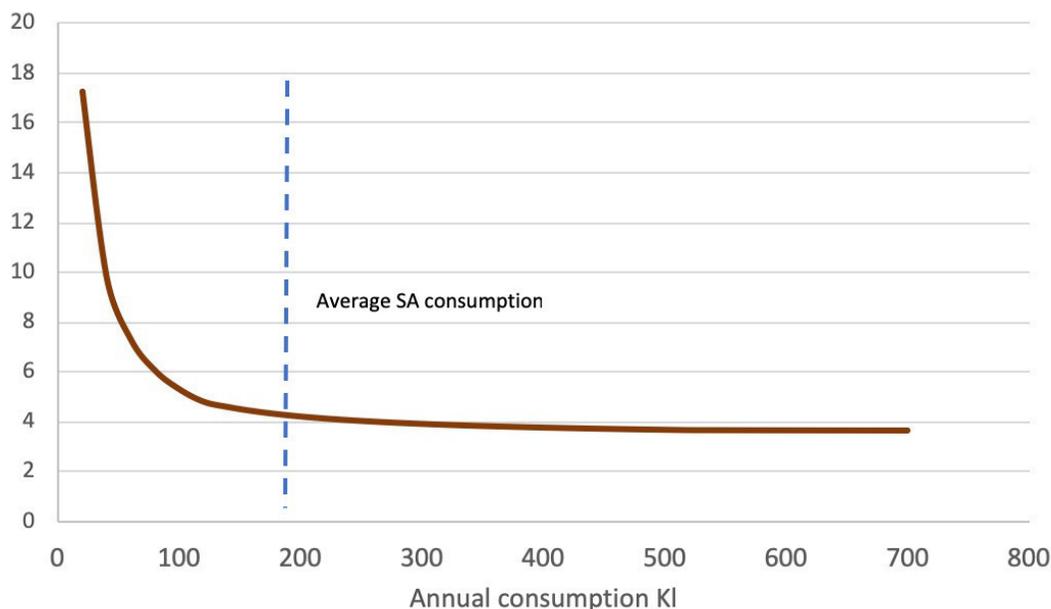
It is notable that water in South Australia is subject to a multi-part tariff, which incorporates a supply charge of \$297.80 a year and a usage charge that rises with usage – \$2.36 for the first 120 Kl a year, \$3.37 for the next 400 Kl, and \$3.65 for use in excess of 520 Kl.

A rising tariff is consistent with the general principle that as the marginal cost of a product rises, so should its price. It's reasonable to assume that as demand rises, SA Water has to use more and more expensive means of providing water, such as desalination. This is particularly so if negative environmental externalities are taken into account.

Also, by most normative standards, we would assume that a rising tariff would be in line with equity principles.

But while the rising tariff may be equitable, there is a strong offsetting inequity in the supply charge, which means the average price paid by consumers with low demand is much higher than the average price paid by high-demand consumers. This is shown in Figure 2 below, using the above 2018-19 tariff structure.

Figure 2. Average water price \$ per Kl



If the supply charge were abolished, and absorbed by higher usage charges, the government could achieve at least two of its objectives.

First, it would be a significant gesture politically, carrying a strong message of equity.

Second, to the extent that higher usage charges may reduce consumption, Water SA would not need to provide so much capacity, resulting in a lower RAB. A lower RAB would not simply be a convenience to justify a price reduction. It would also be a result of a real reduction in demand. There is evidence of a reasonable elasticity effect in relation to increases in water prices (but not, as explained earlier, in relation to price falls).¹²

The only impediment to such a re-structuring appears to be a belief that prices must reflect costs, a belief articulated in a number of places in the documents constituting this review. Because water supply is an industry with high fixed costs and low variable costs, the tariff structure should reflect this cost structure, so the argument goes.

But this is a simplification of the more general economic principle that prices should not detract from efficient resource allocation.

It's a reasonable assumption that whatever the fixed charge – anything from zero up to a level that covers all water supply – every residential premises will be connected. In economic terms the demand for connection is inelastic. Abolition of the fixed charge won't change resource allocation.

¹² Productivity Commission, "Towards Urban Water Reform: A Discussion Paper", Productivity Commission Research Paper 2008. (P 47)

Of course, to the extent that a free connection charge requires the same revenue to be collected in terms of higher usage charges, there will be, as explained above, some reduction in demand. Some may argue that such a reduction in demand would represent a deadweight loss if the price set is higher than the marginal cost of water, but there are probably many ways of satisfying people's needs with lower water use. After all, people don't demand water for its own sake: they seek its services in terms of cleanliness, the enjoyment of gardens and so on. Those services can be met in many ways through conservation measures, such as separation of gray water from drinking water, harvesting of stormwater, provision of tanks and so on.

It's a reasonable proposition that there is plenty of scope for households to reduce their water consumption without any loss in utility and therefore no resource misallocation.