



Water

# SA Water Regulatory Determination 2020: Guidance paper 9



## Annual updates of the regulatory rate of return

December 2019

## Enquiries concerning this Guidance Paper should be addressed to:

Essential Services Commission  
GPO Box 2605  
ADELAIDE SA 5001

Telephone: (08) 8463 4444  
Freecall: 1800 633 592 (SA and mobiles only)  
E-mail: [escosa@escosa.sa.gov.au](mailto:escosa@escosa.sa.gov.au)  
Web: [www.escosa.sa.gov.au](http://www.escosa.sa.gov.au)

Any queries on SA Water Regulatory Determination 2020 should be directed to:

Nathan Petrus, Director Consumer Protection and Pricing

### Related reading

This Guidance Paper should be read in conjunction with the Framework and Approach paper and other Guidance Papers released by the Commission for SA Water Regulatory Determination 2020. Those papers and other information about SA Water Regulatory Determination 2020, are available on the Commission's website:

<https://www.escosa.sa.gov.au/industry/water/retail-pricing/sa-water-regulatory-determination-2020>

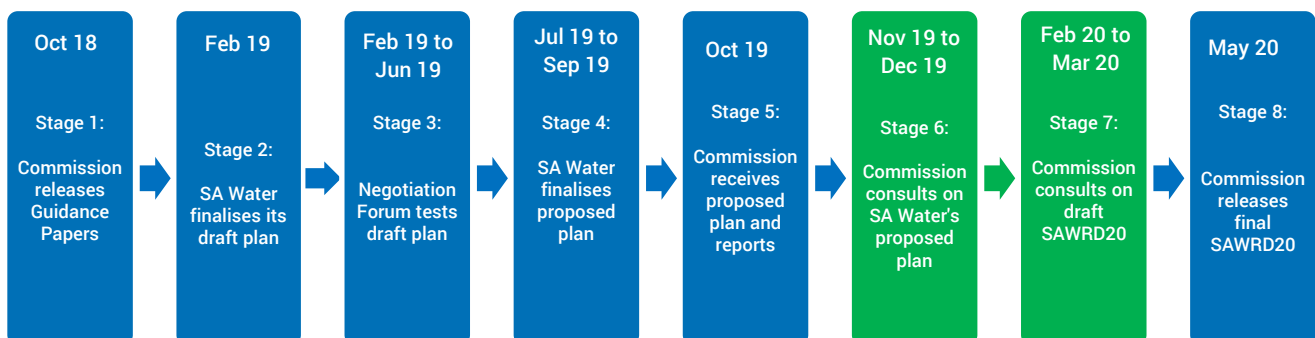
### Timing for this review and upcoming consultation opportunities

While the Commission remains responsible for making the final regulatory determination, which will require SA Water to provide the water and sewerage retail services valued by customers for the lowest sustainable cost, the review process will involve multiple opportunities for stakeholders to be involved prior to that final determination.

Input from a diverse range of stakeholders is important, as it helps the Commission make better informed and more inclusive decisions. The Commission will therefore draw on the full range of evidence provided by all stakeholders in making the final determination.

The timing of the key stages in SA Water Regulatory Determination 2020 is illustrated below, with the Commission's key consultation stages shown in green.

SAW RD20 review timeline



SA Water Regulatory Determination 2020 (**SAW RD20**) will set maximum revenues and minimum service standards for SA Water's drinking water and sewerage services, as well as setting pricing requirements for other miscellaneous retail services, to apply from 1 July 2020 to 30 June 2024.

SAW RD20 will challenge SA Water to:

- ▶ provide water and sewerage services at the lowest sustainable price for the quality and reliability levels valued by customers, and
- ▶ have in place sound, long-term asset management, operating and financing strategies, which support the provision of those services for customers of today and tomorrow.

Those intended outcomes are consistent with the Commission's primary objective of protecting the long-term interests of consumers with respect to the price, quality and reliability of essential services.

## Purpose of this document

In July 2018, the Essential Services Commission (**Commission**) established a framework and approach for SA Water Regulatory Determination 2020 (**SAW RD20**), which is intended to deliver the lowest sustainable prices for the services that SA Water's customers value.<sup>1</sup>

This is the ninth of a series of Guidance Papers released by the Commission to explain the proposed requirements, methodology and process that will apply to SAW RD20. This Guidance Paper outlines the Commission's proposal for updating the allowed regulatory rate of return for SAW RD20 on a yearly basis. It explains the advantages and limitations of the proposal and provides guidance on how the proposed methodology intends to operate. The Guidance Paper highlights key questions for stakeholder consideration.

## Why has the issue of annual updates been raised?

An important part of economic regulation is to incentivise regulated businesses to achieve efficiencies and to manage risk. Under the Commission's regulatory approach, SA Water is incentivised to manage the costs that it can control and bear the risk of underperformance. However, the regulatory rate of return, which represents the efficient cost of financing new and existing regulated assets, can be significantly affected by fluctuations in financial market parameters. In particular, the rate of return is calculated using forecasts of government and corporate bond yields and is fixed at the time of the determination for the four-year regulatory period.

The outlook for government and corporate bond yields is increasingly uncertain the longer the forecast horizon is.<sup>2</sup> This increases the risk of forecast error and, accordingly, the chance that SA Water's allowed return would be different to the efficient cost of financing new and existing regulated assets. Further, SA Water cannot wholly manage movements in these efficient costs in the same way that they might manage operating or capital expenditure. It was in this context that the Commission noted in Guidance Papers 6 and 7 the possibility of using annual updates of the regulatory rate of return as a mechanism to help to avoid the risk of large movements in the regulatory rate of return at each determination.<sup>3</sup>

<sup>1</sup> See Commission (2018), 'SA Water Regulatory Determination 2020: Framework and approach', July 2018, available <https://www.escosa.sa.gov.au/projects-and-publications/projects/water/sa-water-regulatory-determination-2020-framework-and-approach>.

<sup>2</sup> See Commission (2019), 'Guidance paper 7 – the averaging period of the risk free rate', pp. 7-12, available at: <https://www.escosa.sa.gov.au/ArticleDocuments/11293/20190606-SAWRD20-GuidancePaper7-AveragingPeriodRiskFreeCostBorrowing.pdf.aspx?Embed=Y>.

<sup>3</sup> See Commission, Guidance paper 7 – the averaging period of the risk free rate, p.12, and Commission (2019), 'Guidance paper 6 – treatment of inflation in the regulatory rate of return', p.6, available at: <https://www.escosa.sa.gov.au/ArticleDocuments/11293/20190606-SAWRD20-GuidancePaper6-InflationForecastingMethodology.pdf.aspx?Embed=Y>.

The Commission has prepared this Guidance Paper to provide SA Water and other stakeholders with information about the advantages and disadvantages of an annual updates methodology and how the process might work in practice. Under the current approach, the forecast risk associated with financial market based costs within the period is shared by customers and SA Water. The proposed approach, however, can reduce forecast error and, therefore, on an annual basis better align SA Water's revenues and hence customer prices with market conditions. This includes reducing the risk of large changes in revenue and price at the time of each regulatory determination. In this situation, SA Water may be incentivised to more frequently review and plan its pricing and spending decisions. At the same time, there may be disadvantages from implementing the proposal, including administrative costs. These may arise from increased uncertainty about price changes within the regulatory period and annual volatility of the prices for drinking water and sewerage services.

## Stakeholders have initially expressed mixed views on annual updates

SA Water has previously raised concern about the risk of large movements in the regulatory rate of return (and hence of customer prices) that can occur at the time of the regulatory determination each four years.<sup>4</sup> This was one reason that it had previously indicated a preference for the use of a longer-term average to calculate the risk free rate.<sup>5</sup> Despite this, SA Water has recently highlighted its preference not to use an annual update methodology. It anticipates two main concerns with the outcome of the methodology: increased volatility of revenues (and hence of prices) and increased uncertainty for SA Water and its customers about the outlook for customer prices. As stated in its August 2019 submission to the Commission's Guidance Papers 6 and 7:<sup>6</sup>

*We have also noted your alternate suggestion to address the issues around forecasting errors by applying an annual reset to the rate of return. However, the guidance papers have not provided any detail on how such a mechanism would work in practice. Hence, we have undertaken internal modelling on this and, based on this modelling, we do not believe an annual reset approach to be suitable. It does not allow prices to be forecast over the regulatory period and the annual adjustments themselves can create significant uncertainty on both prices for customers and returns to the owner.*

Consistent with those concerns, SA Water has previously stated that customers would prefer price stability.<sup>7</sup>

In contrast, the Customer Negotiation Committee (CNC) has noted support for the notion of annual updates. As stated in the CNC's October 2019 Report of the Independent Chair (Report):<sup>8</sup>

*The Committee is also open to the notion of annual resets of the regulatory rate of return, not only to mitigate forecasting risk but also to mitigate the impact of price shocks at the commencement of each regulatory period.*

*Currently, the rate of return on equity is set for four years, so that when a new regulatory period commences the Commission must adjust the rate to accommodate changes in interest rates which have taken place over the previous four years. This fact alone can produce quite large movements in prices in the first year of the new regulatory period, regardless of the impact of SA Water's business plan.*

---

<sup>4</sup> See Commission, Guidance paper 5 – the cost of funding and using assets, p.14.

<sup>5</sup> See Commission, Guidance paper 5 – the cost of funding and using assets, p.14, and Customer Negotiation Committee (CNC) (2019), 'Report of the Independent Chair', p. 82, available at: <https://www.escosa.sa.gov.au/ArticleDocuments/11296/20191112-Water-SAWRD20-CustomerNegotiationCommittee-IndependentChairReport.pdf.aspx?Embed=Y>.

<sup>6</sup> See SA Water (2019), 'Submission on Guidance Papers 6 and 7 for the SA Water Regulatory Determination 2020', p. 1, available at: [https://www.escosa.sa.gov.au/ArticleDocuments/11293/20190829-Water-SAWRD20-GuidancePapers6\\_7-Submission-SAWater.pdf.aspx?Embed=Y](https://www.escosa.sa.gov.au/ArticleDocuments/11293/20190829-Water-SAWRD20-GuidancePapers6_7-Submission-SAWater.pdf.aspx?Embed=Y).

<sup>7</sup> See Commission, Guidance Paper 5 – the cost of funding and using assets, p. 14.

<sup>8</sup> See CNC, p. 82.

The Report also states:<sup>9</sup>

*The Committee does not dismiss the notion that customers might prefer small annual changes in prices to large price shocks every four years. This could be achieved by adopting the Commission's suggestion of annual resets of the regulatory rate of return. Such an approach would benefit customers in times of falling interest rates and benefit SA Water when interest rates were rising.*

As will be discussed later in the document, the potential benefits of the proposal, such as the reduced risk of large price changes every four years, must be weighed against the potential costs, such as increased uncertainty about, and annual volatility in, customer prices for drinking water and sewerage services. This trade-off is a key issue for stakeholder consideration.

### Stakeholder question

Given the contrasting views of the CNC (which has expressed openness to the notion of annual updates of the regulatory rate of return) and SA Water (which does not see annual updates as suitable), the Commission would welcome stakeholder evidence and views about customer preferences regarding the trade-off between frequency and magnitude of price changes.

## Regulatory practice regarding annual updates

The regulatory rate of return is updated on an annual basis in a number of jurisdictions in Australia (Table 1). The major across-the-board exceptions include the Economic Regulation Authority in Western Australia (ERA) and the Commission.

The annual updates undertaken by regulators typically involve the cost of debt parameter. Those updates aim to align estimates of the cost of debt with the financing strategy of a benchmark efficient firm, which would be expected to refinance some portion (usually assumed to be 10 percent) of its debt portfolio each year.<sup>10</sup> As noted in Guidance Paper 6, the use of annual updates for the cost of debt was an option proposed by the Commission during the 2016 SA Water Regulatory Determination (SAW RD16) review, but was not adopted having regard to the submission from SA Water.<sup>11</sup> At that time, SA Water preferred to keep the regulatory rate of return fixed for the four-year period, stating, as it does now, that annual resets would add price volatility during the regulatory period.

An annual update of the cost of equity would promote consistency with the treatment of the cost of debt, as the two funding sources are partial substitutes. However, in contrast to the cost of debt, regulators do not typically undertake annual updates of the cost of equity.<sup>12,13</sup>

<sup>9</sup> See CNC, p. 83.

<sup>10</sup> For example, see Independent Pricing and Regulatory Tribunal (IPART) (2018), 'Review of our WACC method', pp. 34-35, available at <https://www.ipart.nsw.gov.au/files/sharedassets/website/shared-files/investigation-administrative-legislative-requirements-sea-wacc-methodology-2017/final-report-review-of-our-wacc-method-february-2018.pdf>, and Australian Energy Regulator (2018), 'Rate of return instrument – Explanatory Statement', pp. 276-306, available at: <https://www.aer.gov.au/system/files/Rate%20of%20Return%20Instrument%20-%20Explanatory%20Statement.pdf>

<sup>11</sup> See SA Water (2015), 'SA Water regulatory Rate of Return 2016-2020', Draft Report to the Treasurer, p. 20, available at: <https://www.escosa.sa.gov.au/ArticleDocuments/423/20150204-SAWaterRateOfReturnDraftReportSubmissionSAW.pdf.aspx?Embed=Y>.

<sup>12</sup> The exception is the Queensland Competition Authority (QCA). In this particular instance there is no fixed regulatory period. See Queensland Competition Authority (QCA) (2014), 'Final Report – SEQ Retail Water Long-Term Regulatory Framework – Overview – Part A', September 2014, pp. 11-12, available at: [https://www.qca.org.au/wp-content/uploads/2019/05/25805\\_Part-A-Overview-3.pdf](https://www.qca.org.au/wp-content/uploads/2019/05/25805_Part-A-Overview-3.pdf).

<sup>13</sup> IPART has argued that, to the extent that the risk free rate of interest and the market risk premium move in exact opposing directions, there may be no practical need for an annual update of the cost of equity; see IPART, p. 61. However, while there is some evidence of an inverse relationship between the risk free rate and the market risk premium, the magnitude and timing of that relationship is ambiguous; see AER (2018), 'Discussion paper – market risk premium, risk free rate averaging period and automatic application of the rate of return', pp. 9-10, March 2018, available at: <https://www.aer.gov.au/system/files/AER%20-%20MRP%20Risk%20Free%20Rate%20Averaging%20Period%20and%20Automatic%20Application%20Discussion%20Paper%20-%20March%202018.pdf>.

Table 1: Regulators that undertake annual updates for the regulatory rate of return<sup>14</sup>

Regulator	Rate of return	Cost of debt	Cost of equity
AER <sup>15</sup>	✓	✓	x
IPART <sup>16</sup>	✓	✓	x
ERA	x	x	x
QCA <sup>17</sup>	✓	✓	✓
OTTER <sup>18</sup>	✓	✓	x
ICRC <sup>19</sup>	✓	✓	x
Commission	x	x	x

## Legislative requirements and rate of return principles

In considering annual updates to the regulatory rate of return, the Commission has considered its legislative requirements and its rate of return principles (which are outlined in Appendix A). The proposed annual updates methodology would meet the requirements set out in the pricing order for the regulatory period 1 July 2020 – 30 June 2024 issued in accordance with section 35(4) of the Water Industry Act 2012 (**Pricing Order**).<sup>20</sup> As required under the National Water Initiative (NWI) Pricing Principles, the regulatory rate of return would be calculated using a weighted average cost of debt and equity (**WACC**) and the Capital Asset Pricing Model (**CAPM**) would be used to estimate the cost of equity component.<sup>21</sup> The annual update methodology could meet the requirement to allow for adjustment in revenues in response to events beyond SA Water’s control<sup>22</sup> and, if specified as a formula, could meet requirements for specifying maximum revenues and allowing separate allowances for drinking water and sewerage services.<sup>23,24</sup>

<sup>14</sup> The Victorian Essential Services Commission (ESCV) is not included in Table 1. This is because the ESCV make regulatory determinations under its PREMO methodology. PREMO stands for Performance, Risk, Engagement, Management and Outcomes. PREMO links the return on equity allowed in the revenue requirement to the value delivered by a water corporation to its customers. Under PREMO, a higher level of ambition in terms of delivering customer value results in a higher return on equity. For example, see ESCV (2018), ‘City West Water final decision’, 2018 Water Price Review, 19 June 2018, p. 3, available at: <https://www.esc.vic.gov.au/sites/default/files/documents/2018-water-price-review-city-west-water-final-decision-20180619.pdf>.

<sup>15</sup> The AER does not regulate water. However, as a point of comparison they are included in Table 1. See AER (2018), Rate of return instrument – Explanatory Statement, p. 13.

<sup>16</sup> See IPART, p. 92.

<sup>17</sup> See QCA, pp. 11-12.

<sup>18</sup> See Office of the Tasmanian Economic Regulator (OTTER) (2018), ‘2018 Water and Sewerage Price Determination Investigation – Final Report’, p. 177, available at <https://www.economicregulator.tas.gov.au/Documents/2018%20Water%20and%20Sewerage%20Price%20Determination%20Investigation%20Final%20Report.pdf>.

<sup>19</sup> See Independent Competition and Regulatory Commission (ICRC) (2018), ‘Final report: Regulated water and sewerage services prices 2018-23’, p. xi, available at: [https://www.icrc.act.gov.au/\\_data/assets/pdf\\_file/0019/1250236/Report-1-of-2018-Final-Report-Water-Sewerage-Services-2018-23.pdf](https://www.icrc.act.gov.au/_data/assets/pdf_file/0019/1250236/Report-1-of-2018-Final-Report-Water-Sewerage-Services-2018-23.pdf).

<sup>20</sup> See Treasurer’s Pricing Order for the Regulatory Period 1 July 2020 – 30 June 2024, section 4, available at: [https://www.treasury.sa.gov.au/\\_data/assets/pdf\\_file/0011/41123/Pricing-Order-for-the-Regulatory-Period-1-July-2020-to-30-June-2024.pdf](https://www.treasury.sa.gov.au/_data/assets/pdf_file/0011/41123/Pricing-Order-for-the-Regulatory-Period-1-July-2020-to-30-June-2024.pdf).

<sup>21</sup> See NWI Pricing Principles, p. 6, available at: <http://www.agriculture.gov.au/SiteCollectionDocuments/water/national-water-initiative-pricing-principles.pdf>.

<sup>22</sup> See clause 5.6 of the Pricing Order. A general cost-pass through mechanism, as applied by the Commission in previous determinations, would still be included in the determination. For instance, see Commission (2016), ‘Price Determination: SA Water’s water and sewerage retail services: 2016-2020’, clause 2.10, July 2016, available at <https://www.escosa.sa.gov.au/ArticleDocuments/334/20160606-Water-SAWaterRegulatoryDetermination2016FinalReport-RevenueDetermination.pdf.aspx?Embed=Y>.

<sup>23</sup> See clauses 5.2 and 5.3 of the Pricing Order.

<sup>24</sup> For example, forecast revenues could be updated each year to account for certain predetermined factors in the formula (such as a change in the allowed regulatory rate of return).

Notwithstanding the fact that the proposal is a departure from the Commission's current practice,<sup>25</sup> the annual updates methodology would be consistent with the Commission's rate of return principles. In particular, SA Water's allowed rate of return is intended to reflect what would be expected by private investors looking to invest in a business with a similar degree of risk, and the process of an annual update would be consistent with the behaviour of a private investor expected to regularly review its cost of capital, pricing, capital project alternatives and spending on regulated assets.<sup>26</sup> The process of an annual update would also be consistent with a financing strategy that minimises expected costs in the long term on a risk-adjusted basis, including of a benchmark efficient firm that annually refinances a portion of its debt portfolio.

## Proposed approach

### The WACC

As discussed in Guidance Paper 5, and as noted earlier, the Commission calculates the regulatory rate of return using a real, post-tax WACC.<sup>27</sup> The WACC is set for each year of the four-year regulatory period and is applied to the value of the regulated asset base (RAB) to determine the return on regulated assets.<sup>28</sup>

The formula for the real, post-tax WACC is:

$$WACC_{real}^{post-tax} = \frac{1 + (k_e \frac{E}{V} + k_d \frac{D}{V})}{(1 + i_{exp})} - 1$$

Where the capital structure is assumed to be 60 percent debt and 40 percent equity (ie  $V = E + D$ )<sup>29</sup>

$k_e$  = cost of equity =  $r_f + \beta_L \times MRP$

$r_f$  = risk free rate

$MRP$  = market risk premium

$\beta_L$  = equity beta

$k_d$  = cost of debt

$i_{exp}$  = long-term inflation expectations

The variables listed above were explained in detail in Guidance Paper 5. As such we do not repeat them in full in this paper. A high-level summary of the variables and how they are measured is provided in Table 2.

As noted earlier, the Commission's current approach does not update each year for the cost of debt or the cost of equity. At the start of the determination, the cost of equity is estimated as a single figure used for each of the four years of the regulatory horizon, as is the estimate of long-term inflation expectations. The cost of

<sup>25</sup> The regulatory rate of return should be predictable, based on consistent principles over time and should change only to reflect material changes in evidence or regulatory practice – see the Commission's rate of return principles, namely supporting principle three in Appendix A. Consistent with this, it is known that investors place weight on the stability of the regulatory regime. For example, Moody's methodology for assessing regulated water utilities reportedly assigns a 15 percent weight to the stability and predictability of the regulatory environment; see IPART, p. 15.

<sup>26</sup> For example, fund managers and superannuation funds are known to mark-to-market the value of assets on a regular basis. See Officer and Bishop (2013), 'Review of debt risk premium and market risk premium', prepared for Aurizon, February 2013, p. 37, available at: <http://www.qca.org.au/getattachment/e88cbc57-9a1d-4028-83f7-7b2c1d2b0ff3/Annex-E-%2013VAA-Review-of-Debt-Risk-Premium-and-Mark.aspx>.

<sup>27</sup> Regulators in Australia generally use a real rate of return rather than a nominal rate of return when setting regulated revenues. This is because a real approach leads to constant recovery of an investment return over time, whereas the nominal approach can "front ends" that return. The real approach means that customers pay the same costs (in real terms) for the investment over the life of that investment, which is generally seen as appropriate as the benefit to customers from the investment is constant over its life.

<sup>28</sup> It is also applied to the value of working capital, which is the capital that SA Water requires to cover its day to day expenses for which a commensurate rate of return is appropriate.

<sup>29</sup> That is, the market value of the firm is assumed to equal the market value of equity plus market value of debt.



debt is estimated as separate values for each financial year, but is also estimated at the time of the regulatory determination.

Table 2: Key variables used in calculating the real, post-tax WACC

Parameter	Summary of method as explained in Guidance Paper 5
$r_f$	Yield on 10-year Commonwealth Government Securities (CGS). Average of yields over 20 business days. Presented as a single figure.
MRP	Long-term historical average. Presented as a single figure.
$\beta_L$	Estimate. Presented as a single figure.
$k_d$	10-year trailing average. Yield on BBB corporate bond. Rolling average calculated.
$i_{exp}$	Long-term inflation expectation (10 years), currently calculated as RBA forecast for inflation one-year ahead then assume expectations of 2.5 percent inflation per year for the remaining nine years. Calculate a single figure of expectations by using a geometric average over 10 years.

## Process and parameter selection of annual updates

The proposed methodology for annual updates involves calculating an estimate of the real, post-tax WACC before the start of each financial year (at a date to be determined).<sup>30</sup> This rate of return would be applied to the value of the RAB to determine SA Water’s allowable revenues. The present value of allowable revenues for the four years would give the total allowable revenues for the regulatory period.<sup>31</sup> In practice, and as outlined below, an indicative four-year revenue allowance would be calculated at the start of the determination and revised each year as annual updates of the rate of return occur.

### Parameters to be updated

The WACC formula to be used each year would be the same as outlined earlier (in real, post-tax terms) and the method for estimating individual parameters for use in that formula would be as set out in the regulatory determination. The WACC would be re-calculated each year using updated estimates of selected parameters. Table 3 highlights the parameters to be re-estimated each year and outlines how parameters will be updated.

The parameters to be updated, namely the risk free rate, long-term inflation expectations and the cost of debt, have been selected because the data would be readily available and/or the update is expected to lower forecast error.<sup>32</sup> The exact measurement of the ‘how and what to update’ parameters that are reported in Table 3 are based on the Commission’s existing approach and are subject to possible change as part of SAW RD20.

In principle, all of the parameters in the regulatory rate of return could be updated annually. In practice, however, updates of certain variables is likely to require judgement and a balancing of various evidence. For instance, the market risk premium and equity beta parameters represent investors’ expectations about the riskiness of the firm’s returns relative to the market, and how much risk there is in the market overall. Those

<sup>30</sup> The re-calculation of the annual real post-tax WACC would not likely be directly resource-intensive. Nevertheless, there would need to be a process of fact-checking and agreement on the figures to be used.

<sup>31</sup> The real revenue allowed in each year of the regulatory period is discounted by the pre-tax WACC for each year to calculate the present value of allowed revenue at the start of the regulatory period. The anticipated pre-tax WACC for years two, three and four of the regulatory period would be updated through the annual update process and the present value of allowed revenue would be adjusted accordingly.

<sup>32</sup> See Commission, Guidance paper 7 – the averaging period of the risk free rate, p.6.



expectations are considered difficult to quantitatively estimate and unlikely to be improved through annual re-calculation.<sup>33,34</sup>

In addition, the Pricing Order requires the determination of maximum revenues for the four-year regulatory period, which means that annual updates would need to be undertaken through an objective process, specified at the time of making the regulatory determination. Taken together, those two factors require an annual update process to be limited to those parameters that can be objectively estimated on an annual basis. Table 3 below sets out the parameters that are proposed to be included and excluded from the annual update process. The 'How and what to update' column is based on the Commission's current methodology for setting various individual rate of return parameters.

Table 3: Parameters in the WACC under an annual updates methodology

Parameter	Updated annually	Not updated annually	When to update	How and what to update (based on current WACC methodology)
$r_f$ (risk free rate)	✓		Each financial year	Calculated as the average of yields on ten-year CGS over the last 20 business days prior to the agreed timing of setting the rate of return.
$MRP$ (market risk premium)		✓	At time regulatory determination	Held constant over regulatory period. Determined at the time of the regulatory determination.
$\beta_L$ (equity beta)		✓	At time of regulatory determination	Held constant over regulatory period. Determined at the time of the regulatory determination.
$k_d$ (cost of debt)	✓		Each financial year	Trailing 10-year average of monthly yields on BBB bonds as published by the RBA. Tenth year is based on the latest data prior to the annual update. <sup>35</sup> Assumed debt raising costs are held constant each year.
$i_{exp}$ (long term inflation expectations)	✓		Each financial year	RBA forecast for inflation in the upcoming financial year, as published in the latest Statement of Monetary Policy. Then assume expectations of 2.5 percent thereafter. Calculate a single figure of expectations by using a geometric average of the ten observations.

<sup>33</sup> For a discussion of equity beta, see Commission, Guidance Paper 5 – the cost of funding and using assets, pp. 22-25.

<sup>34</sup> For a discussion of the market risk premium, see Commission, Guidance Paper 5 – the cost of funding and using assets, p. 19.

<sup>35</sup> RBA data would be available within approximately 15-25 days after the end of the month.

## Materiality threshold

The Commission proposes no materiality threshold when applying annual updates.<sup>36</sup> The approach would allow SA Water the flexibility to adjust tariffs each year to adjust for pricing impacts and to provide some of the stability that SA Water claims its customers value, provided that the present value of the total allowable four-year revenue cap is not exceeded. For example, SA Water may choose not to pass through a change to the regulatory rate of return if it is concerned about volatility. However, if the annual adjustments in the years of the determination tend to be in an upward direction, SA Water could forego revenue if it chose not to pass through the adjustment. Conversely, if annual adjustments were to reduce the regulatory rate of return, SA Water would need to be mindful of the diminished revenue envelope, which must be passed through to customers within the regulatory period.

## Worked example

The following worked example of the annual updates approach shows, on a step by step basis, how SA Water's maximum revenues would be adjusted each year to reflect movements in the risk-free rate, cost of debt and long-term inflation expectation.

The values used in the worked example are based on the experience of the **SAW RD16 period**<sup>37</sup> and **do not** represent the Commission's view on the reasonable values of those parameters if the proposal for annual updates were to be used in the SAW RD20 period.

### Step one: calculation of the rate of return at the time of making the regulatory determination

- ▶ The regulatory determination sets a predetermined formula for updating the regulatory rate of return each year to account for annual updates.
- ▶ The rate of return for year one of the period would be set as part of the determination. Table 4 illustrates an example of step one. The example uses a risk free rate of 2.53 percent, cost of debt of 7.22 percent and long-term inflation expectations of 2.45 percent (calculated as the geometric average of ten observations including an RBA forecast of consumer price index (CPI) inflation one-year ahead and nine observations of 2.5 percent). The market risk premium, equity beta and debt raising cost parameters as determined at the initial regulatory setting are applied in step one. Together these parameters produce an allowed real, post-tax WACC for year one of 4.54 percent.
- ▶ Indicative regulatory rates of return for the remaining three years (that is, years two, three and four) would be calculated. These would be calculated following the Commission's current approach. This includes using indicative forecasts of the risk free rate, cost of debt<sup>38</sup> and long-term inflation expectations, and applying the market risk premium, equity beta and debt raising cost parameters as determined at the initial regulatory determination. The combination of allowed revenues for year one and indicative revenues for years two to four would be used to calculate the total four-year indicative revenue, expressed as a present value over four years (using the pre-tax WACC based on the latest regulatory rate of return estimates as the discount rates).

<sup>36</sup> Materiality thresholds have been used in the past as a means to assess whether or not a cost should be passed through to customers. However, to the extent annual updates are used, the decision to pass on variations in selected parameters has been made. It is therefore a matter for SA Water to adjust prices within the bounds of the total allowable revenues that are set.

<sup>37</sup> The parameters used in step one in the worked example are based on the RD16 determination. In steps two to four, however, the nominal risk free rate and cost of debt parameters are based on data to the end of June of each year to when an annual update might occur. The trailing average cost of debt data used in steps two to four may include revisions that have occurred in the published data. Long-term inflation expectations are calculated using RBA forecasts of CPI inflation one-year ahead. RBA forecasts have been taken from the RBA's Statement of Monetary Policy published in May in 2016, 2017, 2018 and 2019.

<sup>38</sup> The indicative forecast of the cost of debt data holds the latest available observation constant for the regulatory horizon and calculates a rolling ten-year average.

- ▶ SA Water then sets its prices for water and sewerage services for year one of the regulatory period in the knowledge of the approach that has been set in the determination (and also in the knowledge of total indicative revenues).

Table 4: Step 1 calculation

	Year 1	Year 2	Year 3	Year 4
Nominal risk free rate (%)	2.53			
<b>Indicative forecast (%)</b>		<b>2.53</b>	<b>2.53</b>	<b>2.53</b>
Cost of debt (%)	7.22			
<b>Indicative forecast (%)</b>		<b>6.87</b>	<b>6.31</b>	<b>5.98</b>
Long-term inflation expectations (%) (geometric average of ten observations based on RBA forecast and nine observations of 2.5%)	2.45			
Assumed RBA forecast of CPI inflation one-year ahead	2.00			
<b>Indicative long-term inflation expectation (%)</b>		<b>2.45</b>	<b>2.45</b>	<b>2.45</b>
<b>Forecasts to hold constant (in grey)</b>				
MRP (%)	6.0	6.0	6.0	6.0
Debt raising costs (%)	0.125	0.125	0.125	0.125
Equity beta (%)	0.7	0.7	0.7	0.7
Real, pre-tax WACC	5.00	4.66	4.30	4.08
<b>Allowed real, post-tax WACC (%)</b>	<b>4.54</b>			
Indicative real, post-tax WACC (%)		<b>4.33</b>	<b>4.01</b>	<b>3.81</b>
Real RAB assumption (\$m)	12000	12000	12000	12000
<b>Allowed real revenue (\$m)</b>	<b>545</b>			
<b>Indicative real revenue (\$m)</b>		<b>520</b>	<b>481</b>	<b>457</b>
Present value real revenue (\$m)	531	<b>473</b>	<b>418</b>	<b>381</b>

#### Step two: annual update prior to year two of the regulatory period

- ▶ The rate of return for year two of the period would be calculated prior to the commencement of year two, using updated estimates of the risk free rate, cost of debt and long-term inflation expectations. The latest available data on the risk free rate would be used. The ten-year average of the cost of debt would be updated based on the latest year of available data. The measure of long-term inflation expectations would be updated (calculated as the geometric average of ten observations including the latest RBA forecast of CPI inflation one-year ahead and nine observations of 2.5 percent). These parameters would be observed in the lead up to the start of the financial year (based on data from the SAW RD16 period those parameters were 2.44 percent, 6.62 percent and 2.45 percent, as shown in Table 5 below). The market risk premium, equity beta and debt raising cost parameters (as determined at the initial regulatory setting) are applied. Together these parameters produce an allowed real, post-tax WACC for year two.
- ▶ The indicative regulatory rates of return for years three and four would be updated. This would be based on the Commission's current approach. This includes indicative forecasts of the risk free rate, cost of debt and long-term inflation expectations as well as the market risk premium, equity beta and debt raising cost parameters as determined at the initial regulatory determination. These indicative revenues for years three and four, combined with the allowed revenue for years one and two, would be used to calculate the total indicative four-year revenue.

- ▶ In this example, the lower rate of return calculated in step two relative to step one decreases the total present value of real indicative four-year revenues by \$65 million (calculated as the difference between the sum of the present value of real revenues in step one and the sum of the present value of real revenues in step two). SA Water then sets its prices for water and sewerage services for year two of the regulatory period in the knowledge of the decreased four-year revenue cap and may lower prices to reflect the increased revenue cap, or not apply the increase until subsequent years, subject to future revenue cap changes.

Table 5: Step 2 calculation

	Year 1	Year 2	Year 3	Year 4
Nominal risk free rate (%)	2.53	2.44		
<b>Indicative forecast (%)</b>			2.44	2.44
Cost of debt (%)	7.22	6.62		
<b>Indicative forecast (%)</b>			5.99	5.60
Long-term inflation expectations (%) (geometric average of ten observations based on RBA forecast and nine observations of 2.5%)	2.45	2.45		
Assumed RBA forecast of CPI inflation one-year ahead	2.00	2.00		
<b>Indicative long-term inflation expectation (%)</b>			2.45	2.45
Real, pre-tax WACC	5.00	4.60	4.24	4.01
<b>Allowed real, post-tax WACC (%)</b>	4.54	4.15		
Indicative real, post-tax WACC (%)			3.78	3.55
Real RAB assumption (\$m)	12000	12000	12000	12000
<b>Allowed real revenue (\$m)</b>	545	498		
<b>Indicative real revenue (\$m)</b>			454	426
Present value real revenue (\$m)	531	453	396	358

### Step three

- ▶ The rate of return calculation for year three would follow the same update process as in step two above. Accordingly, the allowed revenues for year three would be calculated based on the revised rate of return forecasts. The indicative rate of return and hence revenue for year three would be calculated in a similar manner as set out above in step two.
- ▶ The allowed revenues for years one to three and the indicative revenue for year four would be combined to give the total indicative revenues. In this part of the example data from the SAW RD16 period is used.
- ▶ The slightly higher rate of return calculated in step three relative to step two increases the present value of total indicative four-year real revenues by \$16 million (calculated as the difference between the sum of the present value of real revenues in step two and the sum of the present value of real revenues in step three). SA Water can set its prices for year three in the knowledge of the higher revenue cap. Should the decrease in revenues in year two have been deferred, SA Water may choose to use the increase in year three to offset this to the extent that it can.

Table 6: Step 3 calculation

	Year 1	Year 2	Year 3	Year 4
Nominal risk free rate (%)	2.53	2.44	2.72	
<b>Indicative forecast (%)</b>				<b>2.72</b>
Cost of debt (%)	7.22	6.62	5.98	
<b>Indicative forecast (%)</b>				<b>5.58</b>
Long-term inflation expectations (%) (geometric average of ten observations based on RBA forecast and nine observations of 2.5%)	2.45	2.45	2.47	
Assumed RBA forecast of CPI inflation one-year ahead	2.00	2.00	2.25	
<b>Indicative long-term inflation expectation (%)</b>				<b>2.47</b>
Pre-tax WACC	5.00	4.60	4.34	<b>4.11</b>
<b>Allowed real, post-tax WACC (%)</b>	4.54	4.15	<b>3.86</b>	
Indicative real, post-tax WACC (%)				<b>3.63</b>
Real RAB assumption (\$m)	12000	12000	12000	12000
<b>Allowed revenue (\$m)</b>	545	498	<b>464</b>	
<b>Indicative revenue (\$m)</b>				<b>437</b>
Present value real revenue (\$m)	531	453	405	<b>365</b>

#### Step four

- ▶ The allowed rate of return for year four of the period would be calculated using the same process as above. The allowed revenues calculated for year four would, effectively, produce the final calculation of the four-year revenue cap.
- ▶ In step four, the rate of return decreases in year four relative to the estimate made in step three. The decrease would reduce the present value of the four-years of real revenues by \$55 million (calculated as the difference between the sum of the present value of real revenues in step three and the sum of the present value of real revenues in step four). In this final year, SA Water must set its prices for water and sewerage services for year four subject to the final calculation of allowed revenues over the four years. Any over-recovery of revenue that has been deferred in years one to three must be returned to customers in year four. Any under recovery of revenue in years one to three may be recovered in year four. However, to the extent that SA Water considers the recovery of that amount in year four may lead to price shocks for customers, it may apply to the Commission to defer that recovery to the subsequent regulatory period.

Table 7: Step 4 calculation

	Year 1	Year 2	Year 3	Year 4
Nominal risk free rate (%)	2.53	2.44	2.72	1.40
Cost of debt (%)	7.22	6.62	5.98	5.44
Long-term inflation expectations (%) (geometric average of ten observations based on RBA forecast and nine observations of 2.5%)	2.45	2.45	2.47	2.45
Assumed RBA forecast of CPI inflation one-year ahead	2.00	2.00	2.25	2.00
Pre-tax WACC	5.00	4.60	4.34	3.44
<b>Allowed real, post-tax WACC (%)</b>	4.54	4.15	3.86	<b>3.06</b>
Indicative real, post-tax WACC (%)				
Real RAB assumption (\$m)	12000	12000	12000	12000
<b>Allowed revenue (\$m)</b>	545	498	464	<b>367</b>
Present value real revenue (\$m)	531	453	405	<b>310</b>

## Summary of proposed approach

In summary, the Commission's proposed approach:

- ▶ annually re-calculates the real, post-tax WACC (including for the cost of equity and debt) before the start of each financial year, with updated estimates of the risk free rate of return, cost of debt and long-term inflation expectations, and
- ▶ allows SA Water the flexibility to adjust tariffs each year to adjust for pricing impacts, provided that the present value of the total allowable four-year revenue cap, which is the sum present values of each of the calculated allowed annual rates of the return, is not exceeded at the end of the regulatory period.

In addition, the Commission will consider whether or not the proposal for annual updates alters SA Water's exposure to undiversifiable (economy-wide) risk, and hence the riskiness of SA Water's return compared with that of the market. In practice, this could have implications for the level of the equity beta parameter to be set at the time of the regulatory determination.<sup>39</sup>

### Stakeholder questions

- ▶ Do stakeholders have a view on the particular parameters that should be included and excluded in the proposed annual update methodology?
- ▶ The current approach does not have a materiality threshold for annual movements in the rate of return and hence the potential movements in customer prices imposed by annual updates. Do stakeholders see a case for the inclusion of a materiality threshold?
- ▶ The current approach allows for an end-of-period adjustment in which under-recovery by SA Water could be recouped in the next regulatory period. Do stakeholders agree with the inclusion of this type of adjustment?
- ▶ Are there alternative evidence-informed features to the annual update methodology that could be considered?
- ▶ Are there any other views on the proposed methodology?

<sup>39</sup> For a discussion of equity beta, see Commission, Guidance Paper 5 – the cost of funding and using assets, pp. 22-25.

## Risk of volatility

The annual update approach is likely to increase yearly movements in the rate of return, and hence in revenue and prices, relative to the current regulatory period. However, if the rate of return and revenues did not change each year, all other things being equal, there may be a large step-change in the rate of return and revenues at the end of the four-year regulatory period. Considering which method produces greater price volatility depends on the assumed time scale; annual incremental price changes may or may not be considered more volatile than a larger, step-change in revenues every four years.

Price volatility under the proposed approach could, in principle, impose additional costs on SA Water and its customers. It could raise uncertainty in decision-making (for example, firms may compensate for increased uncertainty by adding an extra risk premium to prices, and households may compensate for increased uncertainty by delaying consumption), and could increase the administrative costs faced by SA Water and its customers (for example, the cost of managerial and administrative time and effort of reviewing and changing prices each year to reflect the revised rate of return, rather than once every four years<sup>40</sup>).

However, the trade-off involved (perceived reduced risk of large periodic changes at the expense of more frequent annual changes) is difficult to quantify given that the future level and volatility of financial market based costs is highly uncertain.

## Analysis

An analysis of the SAW RD16 period can help to demonstrate the trade-off involved in weighing up the proposal.<sup>41,42</sup> Table 8 (below) summarises the real, post-tax WACC as allowed in SAW RD16 compared to the WACC that would have been calculated if annual updates had been used.<sup>43</sup> The numbers in Table 8 were used in the worked example. Overall, SA Water's allowed return as determined at the start of SAW RD16 has been higher than that based on annual updates of market parameters. Estimates of the cost of debt have been lower than were allowed, while estimates of the risk free rate have decreased significantly in late 2018 and early 2019.

The largest difference between the allowed rate of return and the annual updated estimate is expected in 2019-20. This partly reflects the sharp fall over the past year in the risk free rate (Figure 1). When viewed over the whole SAW RD16 period, the use of annual updates would have reduced SA Water's return, and hence revenues and customer prices, to be more in line with market based parameters. As a result, it would reduce the likely size of the change in the return between financial year 2019-20 and the start of the new regulatory period starting in 2020-21.

The Commission underscores that the potential revenue and price outcomes from annual updates of the rate of return in the SAW RD20 period may be different to those that would have occurred in the SAW RD16 period, if annual updates had applied.

---

<sup>40</sup> The description is based on a broad definition of so-called 'menu costs'. See Parker (2014), 'Price-setting behaviour in New Zealand', Reserve Bank of New Zealand Discussion Paper Series, August 2014, p. 30, available at: <https://www.rbnz.govt.nz/-/media/ReserveBank/Files/Publications/Discussion%20papers/2014/dp14-04.pdf>.

<sup>41</sup> The period assessed is limited to the SAW RD16 period because the ten-year trailing average of the cost of debt is available from 2015.

<sup>42</sup> While annual movements in the risk free rate and cost of debt have had some partially offsetting impact through SAW RD16, this may not necessarily be the case in the future. For instance, the co-movement between the risk free rate of return and the cost of debt can be affected by various factors including investor risk aversion. The corporate bond spread (the spread between the risk free rate and the yield on corporate bonds) is considered an indicator of risk taking, as increased demand for corporate bonds relative to government bonds reduces the spread and therefore can indicate an investor's willingness to take risk; see Kent (2019), 'The usual transmission – monetary policy and financial conditions', address to Finance and Treasury Association, Sydney, available at: <https://www.rba.gov.au/speeches/2019/sp-ag-2019-08-13.html>.

<sup>43</sup> As noted earlier, the parameters used in year one of the counterfactual analysis (above) are based on the RD16 determination, while the risk free rate, cost of debt and long-term inflation expectations parameters for years two to four are calculated each year in June prior to when the annual update might occur.



Table 8: Real, post-tax WACC parameter values for SAW RD16 and annually updated values

	2016-7	2017-18	2018-19	2019-20
<b>Allowed WACC under SAW RD16 (%)</b>	<b>4.5</b>	<b>4.3</b>	<b>4.0</b>	<b>3.8</b>
Assumptions				
Risk free rate (%)	2.53	2.53	2.53	2.53
Cost of debt (%)	7.22	6.87	6.31	5.98
Long-term inflation expectations (%)	2.45	2.45	2.45	2.45
	2016-17	2017-18	2018-19	2019-20
<b>Real, post-tax WACC (%) (if risk free rate, cost of debt &amp; inflation expectations updated annually)</b>	<b>4.5</b>	<b>4.2</b>	<b>3.9</b>	<b>3.1</b>
Assumptions				
Risk free rate (%)	2.53	2.44	2.72	1.40
Cost of debt (%)	7.22	6.62	5.98	5.44
Long term inflation expectations (%)	2.45	2.45	2.47	2.45

Figure 1: Yield on ten-year CGS

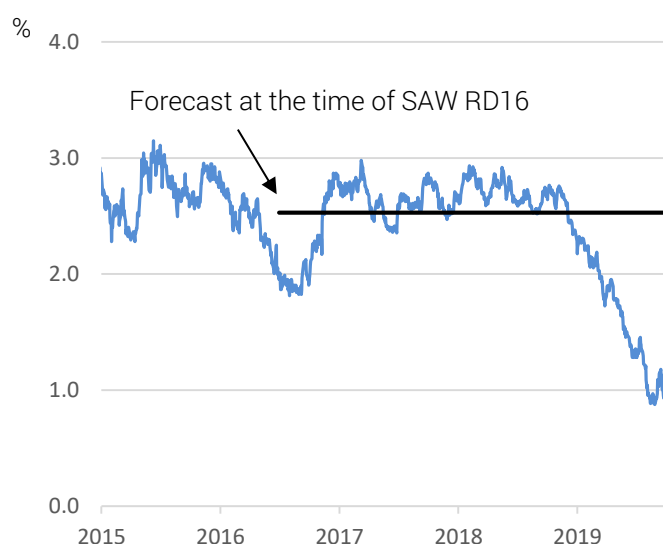


Table 9 highlights the sensitivity of the various parameters in the annual updates approach. The main contributors are the risk free rate and the cost of debt. However, under the annual update method, the measure of long-term inflation expectations would have remained quite similar at the time of each annual reset.<sup>44</sup> As a result, the rate of return under the proposed annual updates methodology and the rate of return allowed under the current methodology are largely unaffected by this parameter.

<sup>44</sup> This reflects the long-term nature of the parameter; for example, under the Commission's current method of estimating long-term inflation expectations, the nine observations of the mid-point of the RBA's target band to be used in the geometric average ultimately drive the outcome of the calculation. See Commission, Guidance Paper 6, p. 8.

Table 9: Sensitivity of WACC to updated variables

	2016-17	2017-18	2018-19	2019-20
<b>Allowed under SAW RD16 (%)</b>	<b>4.5</b>	<b>4.3</b>	<b>4.0</b>	<b>3.8</b>
If only cost of debt updated annually (%)	4.5	4.2	3.8	3.5
If only risk free rate updated annually (%)	4.5	4.3	4.1	3.4
If only long-term inflation expectations is updated annually (%)	4.5	4.3	4.0	3.8
If all three parameters above are updated (%)	4.5	4.2	3.9	3.1

### Some qualitative arguments for why the costs of volatility may be small

There are several qualitative reasons to think that the costs from adjusting prices more regularly may be relatively small. First, the prospect of large periodic price shocks may already be imposing costs on business and households<sup>45</sup> (for example, there is evidence that consumers dislike large periodic changes<sup>46</sup> and some firms may fear that making large price changes may upset customers). Households and businesses that spend proportionally more on water and sewerage services, including some low-income households, may be already more exposed in this regard.<sup>47</sup> Second, fluctuations in the market prices of goods known to be volatile, such as automotive fuel and food, are already managed by households and business. Third, SA Water adjusts its prices by CPI inflation each year within a regulatory period and already incurs certain administrative costs through that process. Further, many Australian firms are known to review prices at regular intervals, often on an annual basis, so the increased administrative costs for SA Water's customers resulting from annual updates may be small.<sup>48</sup> Finally, and as noted above, SA Water has the flexibility to structure its revenue collection and prices to provide some of the stability that SA Water claims its customer's value.

## Conclusion

The Commission has presented a proposal for an annual updating process for the regulatory rate of return. That proposal is consistent with the Commission's rate of return principles and the requirements set out in the Treasurer's Pricing Order.

Given the future level and volatility of financial market based costs is highly uncertain, making an estimate of the costs, and therefore of the trade-off involved in prices, is difficult. If implemented, the proposal could have benefits: annual updates of the regulatory rate of return can more closely align SA Water's revenues and hence customer prices to market conditions. This may reduce the risk of large infrequent changes in the rate of return and hence customer prices at the time of each regulatory determination. At the same time, the proposal could have disadvantages: annual updates may lead to larger annual changes in customer prices than under the current method. Ultimately, this is a key trade-off for stakeholders to consider. Under the current approach, the forecast risk associated with financial market based costs within the period is shared by customers and SA Water. Under the proposed approach, forecast risk associated with financial market based costs is reduced and SA Water's financial based costs are more aligned with market conditions.

The Commission would welcome views on customer preferences regarding that trade-off and on the proposals set out in this Guidance Paper. Any decision by the Commission about the proposal will at the same time consider whether or not the proposal alters the riskiness of SA Water's return compared with that of the market.

<sup>45</sup> For instance, by leading some business and households to require some form of compensation to manage uncertainty.

<sup>46</sup> See Jacobs, Perera and Williams (2014), 'Inflation and the cost of living', Reserve Bank of Australia Bulletin, March quarter 2014, pp. 40-41, available at: <https://www.rba.gov.au/publications/bulletin/2014/mar/pdf/bu-0314-4.pdf>.

<sup>47</sup> See Jacobs, Perera and Williams, p. 38. The authors show evidence that low-income households tend to spend proportionally more on items that are relatively 'essential' in their nature.

<sup>48</sup> See Park, Rayner and D'arcy (2010), 'Price-setting behaviour – Insights from Australian Firms', Reserve Bank of Australia Bulletin, June quarter 2010, pp. 7-14, available at: <https://www.rba.gov.au/publications/bulletin/2010/jun/2.html>.

## Appendix A

**General principle:** The rate of return should reflect the prudent and efficient financing strategy of an incumbent large water utility, which minimises expected costs in the long term, on a risk-adjusted basis.

**Supporting principle 1:** The rate of return should reflect a long-term obligation on the utility to provide reliable and secure water and sewerage services to consumers. It should not solely reflect the new entrant cost of capital.

**Supporting principle 2:** The rate of return should provide an incentive for SA Water to incur prudent and efficient investment in regulated assets and financing costs.

**Supporting principle 3:** The approach to setting the regulatory rate of return should be based on consistent principles over time and should be predictable. It should change only to reflect material changes in evidence or regulatory practice.

**Supporting principle 4:** The assumed prudent financing strategy should not depend on the ownership of the regulated business (that is, the approach is indifferent to whether the entity is in Government or private ownership).