

# SA WATER REGULATORY RATE OF RETURN 2016 – 2020

*Draft Report to the Treasurer*

November 2014



## REQUEST FOR SUBMISSIONS

The Essential Services Commission of SA (**the Commission**) invites written submissions from all members of the community on this paper. Written comments should be provided by **23 January 2015**. It is highly desirable for an electronic copy of the submission to accompany any written submission.

It is Commission's policy to make all submissions publicly available via its website ([www.escosa.sa.gov.au](http://www.escosa.sa.gov.au)), except where a submission either wholly or partly contains confidential or commercially sensitive information provided on a confidential basis and appropriate prior notice has been given.

The Commission may also exercise its discretion not to publish any submission based on length or content (for example containing material that is defamatory, offensive or in breach of any law).

It is preferred that submissions are sent electronically to:

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The Essential Services Commission of South Australia is the independent economic regulator of the water, electricity, gas, ports and rail industries in South Australia. The Commission's primary objective is the *protection of the long-term interests of South Australian consumers with respect to the price, quality and reliability of essential services*. For more information, please visit [www.escosa.sa.gov.au](http://www.escosa.sa.gov.au).

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## GLOSSARY OF TERMS

AER	Australian Energy Regulator
bp	Basis points
CAPM	Capital asset pricing model
CGB	Commonwealth Government Bond
CGS	Commonwealth Government Security
Commission	The Essential Services Commission of South Australia
ERA	Economic Regulatory Authority of Western Australia
ESC Act	Essential Services Commission Act 2002
ESCV	Essential Services Commission of Victoria
SA Water PD 2013	Price determination that applies to SA Water during the regulatory period 1 July 2013 to 30 June 2016
FVC	Fair value curve
ICRC	Independent Competition and Regulatory Commission
IPART	Independent Pricing and Regulatory Tribunal
MRP	Market Risk Premium
NWI	National Water Initiative
QCA	Queensland Competition Authority
RBA	Reserve Bank of Australia
SA Water	South Australian Water Corporation
SA Water PD 2016	Price determination to apply to SA Water during the regulatory period 1 July 2016 to 30 June 2020
SEQ	South East Queensland Water Companies
Treasurer	The Treasurer of the Government of South Australia
Tribunal	The Australian Competition Tribunal
WACC	Weighted average cost of capital



## EXECUTIVE SUMMARY

The Essential Services Commission of South Australia (**Commission**) is responsible for the economic regulation of the water industry in South Australia.

That role includes the regulation of SA Water's drinking water and sewerage revenues. The Commission performs that task through the exercise of statutory price determination powers under the Essential Services Commission Act 2002, as authorised by and in accordance with the terms of the Water Industry Act 2012. The Commission's task is, therefore, undertaken within an overall policy and statutory framework as established by those Acts.

On 2 September 2014, a Pricing Order was made pursuant to the provisions of the Water Industry Act 2012. That is the third Pricing Order made under that Act.

Pricing Orders form a part of the overall policy and statutory framework for the regulation of SA Water's drinking water and sewerage revenues. They may specify factors, parameters, principles or policies which must be applied or taken into account in the making of a statutory price determination. The current Pricing Order sets out certain of those matters for the purposes of the upcoming price determination for SA Water, to take effect from 1 July 2016 (**SA Water PD 2016**). One of the requirements of the Pricing Order is that the Commission is to provide a report to the Treasurer on the proposed approach to calculating a regulatory rate of return to apply to SA Water's assets in the SA Water PD 2016.

This Draft Report seeks public comment on matters relevant to the making of a rate of return determination.

The regulatory rate of return is a key input into the cost "building block" approach used in the regulation of monopoly services, such as those provided by SA Water. It is a measure of the opportunity cost of investment in regulated assets and aims to provide appropriate incentives for ongoing investment in relevant infrastructure.

Consistent with the standard building block approach, the rate of return attempts to forecast the efficient cost of capital to be incurred by a prudent water utility (not SA Water itself) during the period of the SA Water PD 2016.

For most regulated utilities, allowed revenues are highly sensitive to the regulatory rate of return due to the capital intensive nature of infrastructure businesses. The use of efficient benchmarks generally provides incentives for regulated businesses to pursue efficient financing arrangements and ensure that customers do not pay for inefficient funding arrangements, thereby promoting the efficient financing of investment in new infrastructure.

Under the National Water Initiative (**NWI**), to which South Australia is a signatory, the rate of return should be developed in accordance with the weighted average cost of capital (**WACC**) and the cost of equity derived from the capital asset pricing model (**CAPM**).

As a matter of regulatory practice, there are various means by which a rate of return can be established within the bounds of the NWI requirements. In defining its approach for the SA Water PD 2016, the Commission must have regard to the overall statutory framework as outlined above.

An element of that framework requires the Commission to have regard to current Australian practice when determining the regulatory rate of return. While regulators have generally been consistent in their approach to that task over many years, in recent times some regulators have adopted new approaches to setting the regulatory rate of return, including approaches that take a firm-specific view rather than the perspective of an efficient firm.

The Commission has had regard to current regulatory practice in preparing this Draft Report; however, it remains open to views from all stakeholders on alternative approaches on all aspects in the determination of the regulated rate of return for SA Water.

### Methodology

The regulatory rate of return to apply to SA Water should be representative of an efficient water retail business, ensuring that SA Water’s prices reflect efficient financing costs.

As in the current SA Water Price Determination that applies from 1 July 2013 to 30 June 2016 (**SA Water PD 2013**), the Commission proposes to use a post-tax, real framework for determining SA Water’s revenues and the WACC will be calculated using the following formula:

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

where:

- k<sub>e</sub>** = cost of equity
- k<sub>d</sub>** = cost of debt
- i<sub>exp</sub>** = adjustment for expected inflation
- E** = market value of equity
- D** = market value of debt
- V** = market value of the firm (V = E + D)

The regulatory rate of return is dependent on the cost of equity and the cost of debt; with those costs weighted by the proportion of total capital that is financed by debt and by equity.

## *Long-term versus short-term estimation methodologies*

An important threshold consideration for market-based rate of return parameters is the estimation methodology which is to be utilised, including whether a long-term or short-term estimation approach should be used.

The cost of capital can vary substantially over time as supply and demand changes within capital markets. In determining the regulatory rate of return, consideration must be given to whether or not the market-based parameters, which includes the risk-free rate, should reflect current market conditions or some longer-term historic period which may smooth out short-term volatility. While, in theory, the cost of capital could reflect point-in-time market-based observations, regulators generally average those observations over a minimum of 20 days, to ensure that any once-off events are not given undue weight.

The weight of regulatory precedent currently rests with utilising the most recent market observations over a 20 day period (also referred to as an ‘on-the day’ approach)—to ensure that these market-based parameters reasonably reflect current market expectations. This approach is used by the majority of jurisdictional regulators in Australia at present and has been upheld by review tribunals such as the Australian Competition Tribunal. Furthermore, it is consistent with standard corporate finance practice in the private sector.

A long-term averaging period (e.g. 10 years) may be appropriate on the basis that regulated businesses enter into financing arrangements incrementally and the cost of capital, which includes the risk-free rate, will be a product of historical rates that are incorporated into those previous transactions. Advocates of the long-term approach argue that it reduces the risk of future cash-flows not being adequate to service an existing debt portfolio of a benchmark utility firm with long-term investments.

At this time, the Commission considers that the recent market observation approach (taking observations over a 20-day period as close as possible to the commencement of the period of the SA Water PD 2016) has stronger support than the trailing average approach. The Commission is guided by the terms of the applicable statutory framework, which do not mandate the adoption of one methodology to the exclusion of the other (leaving it a matter for the Commission’s discretion) and the balance of regulatory precedent.

Nevertheless, the Commission remains open to stakeholder views on this matter and seeks comment as to which method may be preferable in the context of the SA Water PD 2016 and the reasons for which stakeholders have that preference.

## *Cost of debt*

The cost of debt ( $k_d$ ) is the sum of the risk-free rate ( $r_f$ ) and the debt risk premium (**DRP**):

$$k_d = r_f + \text{DRP}$$

It is important to note that the risk-free rate underpins both the cost of debt and cost of equity calculations.

### ***Term to maturity***

To determine the risk-free rate and debt risk premium, an assumption about the term to maturity of the proxy bond must be made. Regulators have, in the past, adopted either long term bonds, with maturities of between seven or 10 years, or medium term bonds with maturities of five years (or less).

Ten-year bonds have been used on the basis that a water utility is likely to finance its long-life assets with long-term debt (to match assets with liabilities). As a 10 year maturity period is the longest term available for Commonwealth Government bonds (CGBs), that term has been adopted in the past, including by the Commission in its SA Water PD 2013.

However, having reviewed latest regulatory practice and considered arguments for alternative approaches, the Commission now proposes to adopt a four-year term to maturity for the purposes of calculating the risk-free rate and debt risk premium to match the expected length of the regulatory period. The yield on a 10-year bond will reflect expectations of risks over a 10-year period. Many of those risks are reset at each regulatory period and utilising a 10-year bond term may over-compensate regulated utility businesses (particularly assuming an upward sloping yield curve). The Commission therefore considers it more appropriate to align the term of maturity with the regulatory period (of four years) to better reflect SA Water's risks.

The Commission has interpolated yields from three-year and five-year CGBs and corporate bonds (both sourced from the Reserve Bank of Australia) to determine the risk-free rate and debt risk premium for the proxy four-year bond.

### ***Calculating the cost of debt***

Consistent with general regulatory practice, estimation of the debt risk premium is based on an entity with a target capital structure of 60% debt to total value and a BBB credit rating.

#### **Prevailing market conditions ('on the day') approach**

Using RBA data to derive four-year corporate bond yields, averaged over a recent 20-day period, the estimated debt risk premium is 1.69%. It is noted that if this methodology were adopted, this estimate is likely to change at the time of the SA Water PD 2016 to reflect prevailing market conditions.

Using those current observations, the estimated nominal cost of debt would be 4.56% based on the estimated nominal risk-free rate<sup>1</sup> of 2.87% and the above DRP of 1.69%.

#### **Trailing average approach**

To assist stakeholders in considering this matter further, the Commission has also calculated estimates of the cost of debt using a long-term trailing average approach.

The long-term trailing average cost of debt will not fluctuate as much as that based on short-term observations. The longer the period of observations used in a trailing average, the

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<sup>1</sup> The nominal risk free rate is determined from the observed yields of CGBs published by the RBA.

smaller the fluctuations. Over time, the short term fluctuations will be evenly distributed above and below the trailing average. As at 13 October 2014, a 10-year trailing average approach results in a higher cost of debt than an 'on the day' approach.

Employing similar data sources and the same capital structure (and credit) assumptions as above, the 10-year trailing average approach results in a nominal cost of debt of 7.98%<sup>2</sup> based on a nominal risk-free rate of 4.62% and an estimated debt risk premium of 3.35%.

### *Cost of equity*

From the capital asset pricing model, the cost of equity is:

$$k_e = r_f + \beta_L \times \text{MRP}$$

where:

$r_f$  = the risk-free rate (see Section 2)

$\beta_L$  = the levered or equity beta (which reflects the systematic risk of an equity)

**MRP** = the market risk premium (that is, the expected total market return less the risk-free rate).

### *Equity beta*

For the SA Water PD 2016, it is proposed that the value of equity beta ( $\beta_L$ ) should be 0.80, consistent with the SA Water PD 2013. While there is empirical evidence to suggest that the value of  $\beta_L$  may be as low as 0.60, there is potentially a large degree of measurement error underlying that evidence. Furthermore, the Commission has not seen sufficient evidence to demonstrate that there has been a marked discontinuity in market conditions in recent years to result in a material change in  $\beta_L$  from 0.80.

The Commission has considered changes to the regulatory environment that will apply during the term of the SA Water PD 2016, which will reduce the variability in returns to SA Water (relative to the market) and which may support a lower  $\beta_L$  than that applying in the SA Water PD 2013.

In particular, the Pricing Order requires the use of revenue caps, rather than the average revenue caps permitted for the SA Water PD 2013. This change will reduce the risk to SA Water of demand being higher or lower than that forecast (risk in this sense being a departure from the expected outcome, rather than only a down-side risk). A revenue cap guarantees SA Water that it will recover the revenue set in the determination.

However, the revenue cap approach will transfer that risk to consumers, who will face higher or lower prices in the future depending on movements in demand.<sup>3</sup> Revenue caps provide longer-term stability of returns to SA Water and, therefore, lower systematic risk of equity.

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<sup>2</sup> The Reserve Bank of Australia's data series of corporate bond spreads begins at January 2005, offering just short of 10 years of data at this time.

<sup>3</sup> Adjustments to SA Water's prices to reflect under or over-recovery of revenue due to variations in demand may occur during the next regulatory period or may be deferred to the following regulatory period. The

There is, however, practical difficulty in measuring the impact of the movement to revenue caps on the systematic risk of equity. Absent any meaningful way of estimating that impact, the Commission proposes to retain a  $\beta_L$  of 0.80.

### ***Market risk premium***

The final parameter to be estimated for the cost of equity is the market risk premium (**MRP**). The Commission's draft position is to retain the MRP that applied in the SA Water PD 2013 at 6%. This is consistent with the majority of regulatory decisions over the past 10 years, market surveys of academics and market practitioners and sits within the range provided by historical estimates.

### ***Calculating the cost of equity***

The nominal cost of equity that results from these inputs is 7.67%.

### ***Regulatory rate of return***

For the purposes of this Draft Report, the Commission has set out proposed approaches to the estimation of the various parameters used to calculate the rate of return.

Acknowledging that there are different possible approaches in estimating various parameters, the Commission has calculated a low-case estimate of the rate of return and a high-case estimate (presented below).

In doing so, it notes that the weight of regulatory practice and precedent would suggest the adoption of parameters consistent with the assumptions in the low-case scenario, which produces a post-tax, real WACC of 3.83%. Nevertheless, the Commission remains open to stakeholder views and arguments which might support a shift in some or all of those parameters.

The price impact of adopting the high-case estimate (which is based on the long-term averaging approach) is significant and, if adopted, the Commission would need to consider transitional arrangements to avoid customers experiencing price shocks. Alternatively, the Government could address that impact through adjusting the value of SA Water's regulated asset base, as has been contemplated in the September 2014 Pricing Order.

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Commission has requested that SA Water propose details of such a mechanism in its 2016 Regulatory Business Proposal.

**Estimated regulatory rates of return (low and high case)  
and compared with the SA Water PD 2013**

<b>PARAMETER</b>	<i>SA WATER PD 2013</i>	<b>INPUT (LOW CASE)</b>	<b>INPUT (HIGH CASE)</b>	<b>DATA SOURCE</b>
Averaging period	<i>20 days</i>	<b>20 days</b>	<b>10 years</b>	Regulatory precedent
Term to maturity of underlying securities	<i>10 years</i>	<b>4 years</b>	<b>4 years</b>	Regulatory precedent
Nominal risk-free rate	<i>3.25%</i>	<b>2.87%</b>	<b>4.62%</b>	RBA
Credit rating	<i>BBB</i>	<b>BBB</b>	<b>BBB</b>	Regulatory precedent
Gearing	<i>60%</i>	<b>60%</b>	<b>60%</b>	Regulatory precedent
Debt risk premium	<i>2.80%</i>	<b>1.69%</b>	<b>3.35%</b>	RBA
Equity beta	<i>0.8</i>	<b>0.8</b>	<b>0.8</b>	Regulatory precedent
Market risk premium	<i>6%</i>	<b>6%</b>	<b>6%</b>	Regulatory precedent
<b><i>Rates of return (including to debt and equity)</i></b>				
Cost of debt nominal	<i>6.04%</i>	<b>4.56%</b>	<b>7.98%</b>	Calculated from above
Cost of equity nominal	<i>8.05%</i>	<b>7.67%</b>	<b>9.42%</b>	Calculated from above
WACC nominal	<i>6.85%</i>	<b>5.81%</b>	<b>8.56%</b>	Calculated from above
Inflation forecast	<i>2.24%</i>	<b>1.91%</b>	<b>2.63%</b>	RBA
<b>WACC post-tax real</b>	<i>4.50%</i>	<b>3.83%</b>	<b>5.77%</b>	Calculated from above
<b><i>Other parameters (as used in the 'building block' calculation of revenues)</i></b>				
Corporate tax rate	<i>30%</i>	<b>30%</b>	<b>30%</b>	Statutory tax rate
Gamma	<i>0.5</i>	<b>0.5</b>	<b>0.5</b>	Regulatory precedent

# 1. INTRODUCTION

The Essential Services Commission of South Australia (**Commission**), established under the *Essential Services Commission Act 2002 (ESC Act)*, is the independent economic regulator of essential services in South Australia. In undertaking its regulatory functions, the Commission's primary objective is the "***protection of the long-term interests of South Australian consumers with respect to the price, quality and reliability of essential services.***"<sup>4</sup>

Pursuant to section 35(1) of the Water Industry Act, the Commission may make a price determination under the ESC Act regulating prices, conditions relating to prices and price-fixing factors for water and sewerage retail services in South Australia.

The Commission made an initial price determination to apply to SA Water in 2013 (**SA Water PD 2013**). That determination expires in June 2016 and the Commission intends to make a further price determination (**SA Water PD 2016**) to apply from that time.

A Pricing Order, issued under section 35(4) of the Water Industry Act on 2 September 2014, will apply to the making of the SA Water PD 2016. A copy of the Pricing Order is provided in Appendix 1.

The Pricing Order requires the SA Water PD 2016 to:

- ▲ be of a 4 year period, commencing 1 July 2016
- ▲ employ a revenue cap form of control
- ▲ adopt separate revenue cap controls for drinking water and sewerage services but not apply revenue caps based on customer class or location
- ▲ include a mechanism to adjust for any over or under recovery of revenue due to variations between actual and forecast water consumption or sewerage connections
- ▲ include a mechanism that allows for the pass through to customers of efficient and material costs associated with events beyond SA Water's control
- ▲ adopt Regulated Asset Base (**RAB**) values as at 1 July 2013 of \$7.77 billion (drinking water) and \$3.58 billion (sewerage) in December 2012 dollars, and
- ▲ allow SA Water to recover certain non-commercial costs specified by direction under section 6 of the *Public Corporations Act 1993*.

The Pricing Order also sets out certain procedural matters, including a requirement that the Commission provide to the Treasurer a separate report setting out its proposed approach to the calculation of the rate of return on the RAB, which should be consistent with Principle 1 of the National Water Initiative (**NWI**) Principles of the Recovery of Capital Expenditure. That principle states that the rate of return should be developed in accordance with the weighted average cost of capital (**WACC**) and the cost of equity derived from the capital asset pricing model (**CAPM**).

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<sup>4</sup> ESC Act 2002, section 6(a).

This Draft Report outlines the Commission's draft proposals on the regulatory rate of return to apply to SA Water's RAB during the regulatory period commencing 1 July 2016 (period of the SA Water PD 2016). The Commission is seeking submissions from interested parties on this Draft Report and will consider those submissions in preparing its Final Report to the Treasurer on SA Water's regulatory rate of return. The Final Report must be submitted to the Treasurer by 31 March 2015.<sup>5</sup>

## 1.1 *What is the regulatory rate of return?*

The regulatory rate of return represents the opportunity cost of funding regulated investments and is dependent on the market for capital and the financial risks associated with regulated activities.

Consistent with the standard building block approach, the rate of return attempts to forecast the efficient cost of capital to be incurred by a prudent water utility during the period of the SA Water PD 2016.

For most regulated utilities, allowed revenues are highly sensitive to the regulatory rate of return due to the capital intensive nature of infrastructure businesses. The use of efficient benchmarks generally provides incentives for regulated businesses to pursue efficient financing arrangements and ensure that customers do not pay for inefficient funding arrangements, thereby promoting the efficient financing of investment in new infrastructure.

## 1.2 *Operation of the Pricing Order*

The Pricing Order proposes a process for setting SA Water's revenues that is different to the standard regulatory process. In particular, it puts forward a process for the SA Water PD 2016 that will involve:

- ▲ The Commission making a draft price determination, setting out the proposed maximum revenues and highlighting any potential changes between draft and final determination (including any likely change in the regulatory rate of return).
- ▲ The Treasurer considering the need to change the value of SA Water's regulatory asset base through the use of a further Pricing Order, based on the likely final determination outcomes, to deliver a different revenue outcome.

The aspects of the Commission's price determination that will have the greatest impact on SA Water's revenues will therefore be its decisions on forecast capital and operating expenditure.

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<sup>5</sup> The September 2014 Pricing Order requires the Final Report to be provided to the Treasurer by 31 December 2014. However, on 18 November 2014, a new Pricing Order was issued that varied that date to 31 March 2015 (Refer Appendix 2).

### 1.3 Methodology for calculating the rate of return

The Commission will calculate the WACC using the CAPM to determine the cost of equity.

To determine the WACC, the Commission must determine seven distinct parameters; three of which can be observed directly from market and financial data and four that require estimation and analysis. The observable market parameters required by the CAPM and the WACC include:

- ▲ the risk-free rate ( $r_f$ );
- ▲ the debt risk premium (**DRP**) or debt margin; and
- ▲ the adjustment for expected inflation ( $i_{exp}$ ).

The other four parameters that require estimation or analysis are:

- ▲ the market risk premium (**MRP**); that is, the expected total market return less the risk-free rate;
- ▲ the degree of systematic risk of an equity – also referred to as the equity beta ( $\beta_L$ );
- ▲ the level of debt and equity in the business, otherwise referred to as the level of gearing of the business; and
- ▲ the value of imputation credits ( $\gamma$ ) - also referred to as “gamma”.<sup>6</sup>

Accordingly, the first step in determining the rate of return is to derive the cost of equity from the CAPM, where the cost of equity is defined as:

$$k_e = r_f + \beta_L \times \text{MRP}$$

where:

$r_f$  = the risk-free rate;

$\beta_L$  = the equity beta;

MRP = the market risk premium.

The second step is to determine the cost of debt ( $k_d$ ), which is the sum of the risk-free rate ( $r_f$ ) and the DRP:

$$k_d = r_f + \text{DRP}$$

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<sup>6</sup> In a post-tax approach, the gamma is accounted for in the tax allowance of the building block approach and not in the regulatory rate of return.

The final step is to weight those returns by the relative proportions of debt and equity in an appropriate manner. The real post-tax WACC formula used by the Commission is:

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

where:

- E = market value of equity
- D = market value of debt
- V = market value of the firm (V = E + D)
- i<sub>exp</sub> = adjustment for expected inflation.

### 1.4 Current rate of return for SA Water

In the SA Water PD 2013, the Commission set the regulatory rate of return to apply to SA Water’s regulated assets from 1 July 2013 as close as possible to that date, so that the most up-to-date data could be utilised.

The rate of return was set using a post-tax, real WACC, with the cost of equity calculated using the CAPM (summarised in Table 1.1 below).

**Table 1.1: Rate of Return for SA Water: SA Water PD 2013<sup>7</sup>**

PARAMETER	SA WATER PD 2013
Averaging period	20 days
Nominal risk-free rate	3.25%
Inflation forecast	2.24%
Debt risk premium	2.80%
Credit rating	BBB
Gearing	60%
Equity beta	0.80
Market risk premium	6%
Corporate tax rate	30%
Gamma	0.50
<b>WACC post-tax real</b>	<b>4.50%</b>

<sup>7</sup> Essential Services Commission of South Australia, *SA Water’s Water and Sewerage Revenues 2013/14 – 2015/16 Final Determination – Statement of Reasons*, May 2013, p.134, (available at <http://www.escosa.sa.gov.au/Publications/DownloadPublication.aspx?id=2632&versionId=2779>).

## 2. RISK-FREE RATE

### 2.1 Introduction

The risk-free rate is the rate of return at which investors are able to invest their capital without risk.

The most commonly adopted proxy for a risk-free rate in Australia is the yield on long-term Commonwealth Government bonds or securities (CGB or **CGS**). As the market value of CGBs fluctuates with interest rates, they are not completely risk-free. However, CGBs are often regarded as default risk-free securities due to the guaranteed return of capital provided by the Australian Government.

The risk-free rate is observed directly from market data and is a required parameter to calculate the cost of equity and the cost of debt.

In order to calculate the risk-free rate, the Commission will need to determine:

- ▲ the security that will act as the proxy for the risk-free rate
- ▲ the term to maturity of the proxy instrument
- ▲ the appropriate period for taking observations (the averaging period).

### 2.2 The SA Water PD 2013

The SA Water PD 2013 calculated a risk-free rate using the following approach:

- ▲ it used a 10-year CGB, which is the longest traded Government security, as a proxy for a risk-free asset.
- ▲ it calculated the risk-free rate by averaging the yields on a 10-year CGB over a 20 business day period, as close as possible to the date of making the determination in order to capture the most recent market data.

### 2.3 Current regulatory practice

Most Australian economic regulators align the CGB term to maturity with the length of the regulatory period. Only the Essential Services Commission – Victoria (**ESCV**) and the Australian Energy Regulator (**AER**) currently use a 10-year CGB to determine the risk-free rate. The Independent Pricing and Regulatory Tribunal (**IPART**), Queensland Competition Authority (**QCA**) and Economic Regulation Authority (**ERA**) all use either a four or five-year CGB.

Regulators generally adopt either a 20 day or 40 day averaging period, although IPART uses a range based on averaging over 40 days and 10 years. The AER is the only regulator that differs in this regard; it is proposing to use a 10-year trailing averaging period in future price determinations.

The arguments for adopting various terms to maturity and averaging periods are discussed in the following section.

**Table 2.1: Maturity dates and averaging periods assumed by other regulators**

ESCV	IPART		QCA	ERA		AER	ICRC
Water Price Review Greater metropolitan water businesses June 2013 <sup>8</sup>	Water Price Review Hunter Water Corporation June 2013 <sup>9</sup> Current market data		Water Price Review Seqwater Irrigation April 2013 <sup>10</sup>	Water Inquiry Efficient costs and tariffs March 2013 <sup>11</sup>	Electricity Access Determination Western Power Network September 2012 <sup>12</sup>	Electricity Rate of Return Guideline December 2013 <sup>13</sup>	Water Final Report: Regulated water and sewerage services, June 2013 <sup>14</sup>
Average yield on 10-year nominal CGB	5-year CGB yield	5-year CGB yield	4-year CGB	Average yield on 5-year CGB as reported	Based on yields from 5-year CGB as reported by the RBA	10-year CGB yield	Uses ACTEW's actual cost of debt based on ACTEW's 2 year projected yield
40 day trading period	40 day average	10 year average	20 trading days	20 trading days	20 business days	20 business days	N/A

<sup>8</sup> ESCV, *Price Review 2013: Greater Metropolitan Water Businesses – Final Decision*, June 2013, p.108 (available at <http://www.esc.vic.gov.au/getattachment/653684bc-1058-4cc9-a62b-c31053e7762a/Metropolitan-water-price-review-2013-18-final-deci.pdf>).

<sup>9</sup> IPART, *Hunter Water Corporation's water, sewerage, stormwater drainage and other services: Review of prices from 1 July 2013 to 30 June 2017 – Final Report*, June 2013, p.186 (available at [http://www.ipart.nsw.gov.au/files/00b55712-a330-437c-8459-a1d600daf637/Final\\_Report\\_-\\_HWCs\\_water\\_sewerage\\_stormwater\\_drainage\\_and\\_other\\_services\\_-\\_1\\_July\\_2013\\_to\\_30\\_June\\_2017.pdf](http://www.ipart.nsw.gov.au/files/00b55712-a330-437c-8459-a1d600daf637/Final_Report_-_HWCs_water_sewerage_stormwater_drainage_and_other_services_-_1_July_2013_to_30_June_2017.pdf)).

<sup>10</sup> QCA, *Final Report, Seqwater Irrigation Price Review 2013-17, Volume 1*, April 2013, p.271 (available at <http://www.qca.org.au/getattachment/3662b6af-fbd0-43a5-a52b-e99c2f6e85be/Seqwater-Irrigation-Price-Review-2013-17-Volume-1.aspx>).

<sup>11</sup> ERA, *Inquiry into the Tariffs of the Water Corporation, Aqwest and Busselton Water: Revised Final Report*, March 2013, p.57 (available at <http://www.erawa.com.au/cproot/11248/2/20130328%20D104647%20-%20Inquiry%20into%20the%20efficient%20costs%20and%20tariffs%20of%20the%20water%20corp%20aagwest%20and%20cusselton%20water%20-%20revised%20final%20report.pdf>).

<sup>12</sup> ERA, *Final Decision on Proposed Revisions to the Access Arrangement for the Western Power Network*, September 2012, p.327 (available at <http://www.erawa.com.au/cproot/10737/2/20120905%20-%20D94955%20-%20Final%20Decision%20on%20Proposed%20Revisions%20to%20the%20Access%20Arrangement%20for%20the%20Western%20Power%20Network%20-%20Published%20Version.pdf>).

<sup>13</sup> AER, *Better Regulation: Rate of Return Guideline*, December 2013 (available at <http://www.aer.gov.au/sites/default/files/AER%20Rate%20of%20return%20guideline%20-%20December%202013.pdf>).

<sup>14</sup> ICRC *Final Report: Regulated water and sewerage services, 1 July 2013 to 30 June 2019*, Report 5 of 2013, June 2013 (available at [http://www.icrc.act.gov.au/wp-content/uploads/2013/06/1-WSS-Final-Report\\_25June13-FOR-WEB1.pdf](http://www.icrc.act.gov.au/wp-content/uploads/2013/06/1-WSS-Final-Report_25June13-FOR-WEB1.pdf)).

## 2.4 Commission's considerations

### 2.4.1 Term to maturity

In the past, regulators have generally used 10-year CGBs as a proxy to measure the risk-free rate on the basis that a 10-year bond has the longest term to maturity and is most consistent with the life of a regulated utility's assets (which have an average life of around 60 years). In recent reviews and determinations by other regulators, there has been a move toward shorter maturities, as shown in Table 2.1.

The Commission notes the debate that has developed with regard to the appropriateness of a 10-year term for the proxy bond. Subject to the term structure of the bond (an upward or downward sloping yield curve), it is possible that an over or under-recovery of revenue could occur if the term of the bond exceeds the length of the regulatory period. One approach to circumvent this issue is to use a bond that possesses a term that matches the regulatory cycle (e.g. four years) instead of the life of the regulatory assets.

Decisions to match the term to maturity of the bond with the regulatory period are generally based around the following arguments:

- ▲ 10-year bonds do not completely align with the life of the assets and financing.
- ▲ Risk minimisation is achieved by a combination of short-term debt and hedging options.
- ▲ 10-year bonds provide compensation for risks that regulated entities do not bear. It is understood that the yield on 10-year bonds exceeds the yield on five-year bonds to compensate investors for liquidity or inflationary risks. If this is the case, regulated companies will be rewarded with a higher rate of return although the risk associated with liquidity and inflation is reset each regulatory period.

Regulatory precedent has moved towards the use of terms to maturity that match the regulatory period, rather than the life of regulated assets. Regulators have increasingly recognised that matching debt to future cash flows (which are reset every four or five years) is more relevant to a regulated business than matching debt to asset lives.

While there are likely to be advantages from matching the term of the risk-free rate with the regulatory period, there may also be some disadvantages including that the use of securities with shorter-term maturities may lead to the regulated entity incurring additional transaction costs with re-financing and hedging.

The Commission acknowledges that regulatory precedent is now in support of a four or five year term to maturity. While it previously adopted a 10-year term on the basis that it reflected the longest dated bond available to align with the average life of a utility's longer-term regulated assets, the Commission accepts that it does not match those asset lives particularly closely and, in any case, there is now strong evidence to suggest that the term of the regulatory period is a more relevant consideration than asset lives.

***Draft Position:***

***The Commission's draft proposal is to use four-year CGBs, interpolated from three-year and five-year CGBs, although it welcomes comments from all interested parties on the merits of continuing with a 10-year CGB.***

## 2.4.2 Averaging period

The cost of capital can vary substantially over time as supply and demand changes within capital markets. In determining the regulatory rate of return, consideration must be given to whether or not the market-based parameters, which includes the risk-free rate, should reflect current market conditions or some longer-term historic period which may smooth out short-term volatility. While, in theory, the cost of capital could reflect point-in-time market-based observations, regulators generally average those observations over a minimum of 20 days, to ensure that any once-off events are not given undue weight.

The choice of averaging period, which can range from 20 days to 10 years under current regulatory practice, also impacts the debt risk premium and inflation parameters.

### 2.4.2.1 Long-term averaging periods

A long-term averaging period (e.g. 10 years) may be appropriate on the basis that regulated businesses enter into financing arrangements incrementally and the cost of capital, which includes the risk-free rate, will be a product of historical rates that are incorporated into those previous transactions. Advocates of the long-term approach argue that it reduces the risk of future cash-flows not being adequate to service an existing debt portfolio of a benchmark utility firm with long-term investments.

The long-term averaging approach has also been supported on the basis that it gives more stability to the prices customers pay as well as the revenue stream for the regulated business as it removes the volatility inherent in a short-term approach. It is also seen as providing an opportunity for regulated businesses to hedge against the risk of changes in the cost of debt. That hedging opportunity may not be available under a short-term approach, as it may not be possible for a regulated business to refinance all debt at a single point in time based on prevailing rates, given the size of the debt and the lack of credit default swaps in the market.<sup>15</sup>

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<sup>15</sup> QCA, *Issues Paper: Trailing average cost of debt*, March 2014, (available at <http://www.qca.org.au/getattachment/e12f3e72-d72b-451b-83d0-525c7607ef89/Issues-Paper-Trailing-Average-Cost-of-Debt.aspx>.)

### 2.4.2.2 Short-term averaging periods

Those that support a short-term averaging period argue that it provides a more accurate measure of the cost of debt that a regulated business will incur over the future regulatory period. The long-term approach could provide an overstatement of the regulatory cost of debt, as a firm which adopts an efficient debt policy would stagger the maturity profile so that only a proportion of debt would mature each year. This would involve the use of interest rate swaps to reduce the borrowing term for the risk-free rate to reduce its cost of debt (assuming a positive yield curve).<sup>16</sup> Such a strategy would involve higher debt management costs and, as the QCA argues,:

*Given the trailing average applied to the total cost of debt will include a 10-year risk-free rate as compared with a shorter term risk-free rate under the other two approaches, it is expected that adopting this approach would systematically lead to an average cost of debt being higher in the long run. Estimates obtained by the QCA during recent water investigations suggest that the transactions costs for interest rate swaps are considerably less than the term premium for the 10-year risk-free rate.<sup>17</sup>*

Many regulators have also concluded that an approach based on prevailing market conditions is more consistent with the objective of economic efficiency, as it ensures that any future investment decisions reflect the prevailing cost of debt, not historic costs. For example, the Economic Regulation Authority has argued that it is the *marginal* cost of debt that is important in driving the correct signals for future investment rather than the *actual* (historic) cost of debt. It points out that a long-term averaging approach, which factors in historic costs of debt, may create incentives for either over-investment or under-investment, if it is different to the prevailing cost of debt.<sup>18</sup>

One objective of regulation is to provide a monopoly utility with a business environment as close as possible to that experienced by an efficient firm within a competitive market. In such an environment, the forward-looking WACC is dynamic – changing every day with the sentiments of the market. For that reason, the Commission supports the use of a short-term averaging period, which is consistent with the objective of promoting economic efficiency. While acknowledging that the AER and IPART utilise (to some extent) a long-term averaging approach, current regulatory practice still generally favours a short-term averaging period.

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<sup>16</sup> See QCA, *Issues Paper: Trailing average cost of debt*, March 2014, p.16, (available at <http://www.qca.org.au/getattachment/e12f3e72-d72b-451b-83d0-525c7607ef89/Issues-Paper-Trailing-Average-Cost-of-Debt.aspx>).

<sup>17</sup> See QCA, p. 17

<sup>18</sup> Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines, Appendix 3*, p.32, (available at <http://www.erawa.com.au/cproot/11955/2/Appendices%20to%20the%20Explanatory%20Statement%20of%20the%20Rate%20of%20Return%20Guidelines.pdf>).

**Draft Position:**

**At this time, the Commission considers that the recent market observation approach (taking observations over a 20-day period as close as possible to the commencement of the period of the SA Water PD 2016) is preferable to a trailing average approach. This preference is guided by the terms of the applicable statutory framework, which do not mandate the adoption of one methodology to the exclusion of the other (leaving it a matter for the Commission's discretion) and the balance of regulatory precedent.**

**The Commission's draft proposal is to utilise a 20 day averaging period for determining the risk-free rate.**

**As at 13 October 2014, the observations from four-year CGBs over a 20 day averaging period result in a nominal risk-free rate of 2.87%.**

**Nevertheless, the Commission remains open to stakeholder views on this matter and seeks comment as to which method may be preferable in the context of the SA Water PD 2016 and the reasons that stakeholders have that preference.**

## 2.5 Sensitivity analysis

Changes to the risk-free rate have a substantial influence on the rate of return. For example, holding all other parameters constant, a 1% (100 basis points) change in the nominal risk-free rate will change the rate of return by approximately 1%.

Noting the open debates in relation to these estimation techniques, as summarised above, the Commission has undertaken a sensitivity analysis to demonstrate the effects of using the alternative approaches. Table 2.2 presents the range of nominal risk-free rates that result from the different assumptions regarding averaging periods and term to maturity and, in a similar manner, Table 2.3 presents the rates of return that result from the same assumptions.

**Table 2.2: The range of nominal risk-free rates resulting from different maturity terms and averaging periods**

<b>RISK-FREE RATE</b>	<b>TERM TO MATURITY</b>	
<b>Averaging approach</b>	<i>10 year</i>	<i>4 year</i>
20 days	3.50%	2.87%
10 year trailing average	4.93%	4.62%

**Table 2.3: The range of regulatory rates of return resulting from different maturity terms and averaging periods**

RATE OF RETURN	TERM TO MATURITY	
<b>Averaging approach</b>	<i>10 year</i>	<i>4 year</i>
20 days	4.68%	3.83%
10 year trailing average	5.74%	5.77%

## 3. INFLATION FORECAST

### 3.1 Introduction

The Commission proposes to utilise a real rate of return in its framework for determining SA Water’s revenues for the SA Water PD 2016. As the relevant observable market parameters that deliver the rate of return are nominal in nature, the resulting rate must be converted to a real rate of return.

To convert a nominal rate of return into a real rate of return, the nominal rate of return is “deflated” by the inflation expectation using the Fisher Equation<sup>19</sup>. Accordingly, a forecast of the inflation expectation is required.

### 3.2 The SA Water PD 2013

In the SA Water PD 2013, the Commission used inflation-indexed 10-year CGBs averaged over a 20 day trading period as published by the RBA to derive a forecast of the inflation rate.

The forecast was determined by the difference between the yields on inflation-indexed bonds and non-indexed (nominal) CGBs of the same maturity calculated by the Fisher equation. As both of these bonds are traded in the domestic bond market, an up-to-date view of the market’s expectations of the forecast for the inflation rate over the applicable time period was established.

### 3.3 Current regulatory practice

As is the case for the estimation of the risk-free rate (described in the previous Chapter), the estimation of forecast inflation relies on the choice of security and the averaging period.

The approaches taken by other regulators in recent decisions is summarised in Table 3.1 below.

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<sup>19</sup> The Fisher equation can be expressed as:  $(1 + \text{nominal rate}) = (1 + \text{real rate}) \times (1 + \text{inflation rate})$ .

**Table 3.1: Inflation forecasting methodology used by other regulators**

ESCV	IPART		ICRC	ERA		AER	QCA
<p><b>Water</b></p> <p>Price Review Greater metropolitan water businesses<sup>20</sup></p>	<p><b>Water</b></p> <p>Price Review Hunter Water Corporation<sup>21</sup></p>		<p><b>Water</b></p> <p>Price Review Regulated Water and Sewerage services<sup>22</sup></p>	<p><b>Water</b></p> <p>Inquiry Efficient Costs and Tariffs<sup>23</sup></p>	<p><b>Electricity</b></p> <p>Access Determination Western Power Network<sup>24</sup></p>	<p><b>Electricity</b></p> <p>Rate of Return Guideline<sup>25</sup></p>	<p><b>Water</b></p> <p>Statement of Regulatory Pricing Principles<sup>26</sup></p>
	Current market data	Long-term averages					
<p>Considered the recent trends in inflation, and the range of longer-term forecasts.</p>	<p>40-day average of swap market implied inflation with a 5-year term-to-maturity.</p>	<p>Breakeven inflation from bond markets using 10-year term-to-maturities averaged over 10 years.</p>	<p>2.5%</p> <p>The midpoint of the 2-3% range adopted by the RBA as its target for inflation.</p>	<p>Estimated using yields on five-year CGBs.</p>	<p>Estimated by taking market observations of nominal and indexed CGBs and then applying the Fisher equation.</p>	<p>None</p> <p>Uses a nominal basis to calculate the allowed rate of return, therefore no estimate for inflation required.</p>	<p>None</p> <p>Uses a nominal basis to calculate the allowed rate of return, therefore no estimate for inflation required.</p>

### 3.4 Commission's considerations

Federal Treasury has previously raised concerns over the potential bias in the yields on 10-year inflation-indexed bonds. The number of inflation-indexed bonds has been noted by the Federal Treasury to be declining, and if these bonds continue to mature without replacement, a bias in inflation estimates may occur.<sup>27</sup>

Notwithstanding that issue, the Commission is of the view that inflation-indexed bonds are currently the best available option for determining the forecast inflation rate. The Commission notes that it may need to revise this methodology if the number of inflation-indexed bonds continues to decline.

<sup>20</sup> ESCV, *Price Review 2013: Greater Metropolitan Water Businesses – Final Decision*, June 2013, p.108.

<sup>21</sup> IPART, *Hunter Water Corporation's water, sewerage, stormwater drainage and other services: Review of prices from 1 July 2013 to 30 June 2017 – Final Report*, p.186.

<sup>22</sup> ICRC, *Final Report- Regulated Water and Sewerage Services*, June 2013, pp.xviii, 42, 69, (available at [http://www.icrc.act.gov.au/wp-content/uploads/2013/06/1-WSS-Final-Report\\_25June13-FOR-WEB1.pdf](http://www.icrc.act.gov.au/wp-content/uploads/2013/06/1-WSS-Final-Report_25June13-FOR-WEB1.pdf)).

<sup>23</sup> ERA, *Inquiry into the Tariffs of the Water Corporation, Aqwest and Busselton Water: Revised Final Report*, March 2013, p.60.

<sup>24</sup> ERA, *Final Decision on Proposed Revisions to the Access Arrangement for the Western Power Network*, September 2012, p.329.

<sup>25</sup> AER, *Better Regulation: Rate of Return Guideline*, December 2013, (available at <http://www.aer.gov.au/sites/default/files/AER%20Rate%20of%20return%20guideline%20-%20December%202013.pdf>).

<sup>26</sup> QCA, *Statement of Regulatory Pricing Principles for the Water Sector*, December 2000, p.93, (available at <http://www.qca.org.au/getattachment/fba12b74-f307-45e9-91f4-6dc9cf50509c/Statement-of-Regulatory-Pricing-Principles-for-the.aspx>).

<sup>27</sup> Australian Federal Treasury, *The Treasury bond yield as a proxy for the CAPM Risk-free rate*, 7 August 2009.

Given the need to ensure internal consistency with other similar market-based parameters of the regulatory rate of return, the Commission proposes to utilise, wherever possible, market observations of financial instruments that reflect the four year term of the period of the SA Water PD 2016 (or a period as close as possible to it). In addition, for similar reasons to those outlined in the previous Chapter, the observations in determining the inflation rate will be based on a 20 day averaging period.

However, for the purposes of this Draft Report, the Commission was unable to obtain relevant market information on inflation-indexed CGBs that would apply to a four-year term and, in the interim, has therefore used 10-year CGBs to derive the inflation forecast.

As at 13 October 2014, using 10-year nominal and inflation-indexed CGBs, averaged over 20 days, delivered an inflation forecast of 1.91% (and 2.63% using 10 year trailing averages) as presented in Table 3.2 below.

**Table 3.2: The inflation forecast resulting from different averaging periods and terms to maturity**

INFLATION FORECAST	TERM TO MATURITY	
<b>Averaging approach</b>	10 year	4 year
20 days	1.91%	n/a
10 year trailing average	2.63%	n/a

The Commission will seek to obtain inflation estimates for 4-year CGBs in time for its Final Report. It remains open to stakeholder views as to which method may be preferable in the context of the SA Water PD 2016 and the reasons that stakeholders have that preference.

**Draft Position:**

***The Commission’s draft proposal is that the inflation forecast should be calculated by comparing four-year inflation-indexed CGBs with four-year nominal CGBs, averaged over 20 days, as published by the RBA. In the absence of data to enable it to calculate that inflation forecast, this Draft Report adopts an inflation forecast based on 10-year bonds. The Commission will resolve this matter in its Final Report.***

***As at 13 October 2014, the observations from 10-year nominal and indexed CGBs over a 20 day averaging period result in an inflation forecast of 1.91%.***

### 3.5 Sensitivity analysis

The forecast inflation rate has a considerable (inverse) impact on the overall rate of return. Holding all other parameters constant, a change of 1% in the inflation forecast will change the rate of return by -1%.

## 4. COST OF DEBT

### 4.1 Introduction

The cost of debt is driven by the price that investors are willing to pay for a business' bonds in the market. Specifically, the cost of debt will comprise the risk-free rate and a premium above the risk-free rate.

This premium is referred to as the debt risk premium (**DRP**) and is the return above the risk-free rate that compensates investors for the systematic and default risks associated with the company's bonds.

In estimating the cost of debt, the following inputs are required:

- ▲ the firm's gearing level; expressed as the ratio of debt to total assets (that is, debt plus equity)
- ▲ the credit rating of the firm's capacity to meet its debt obligations
- ▲ the term structure of the firm's debt, and
- ▲ the averaging period of observations of the various market-based financial instruments.

The regulatory rate of return is dependent on the assumed proportion of assets financed by debt and equity, i.e. the gearing ratio. Specifically, this refers to the ratio of debt to regulatory assets. The regulatory asset base is the value of the assets used to provide the regulated services, and on which the entity is able to earn a regulatory rate of return. The gearing ratio chosen should reflect a prudent and efficient capital structure of a benchmark utility firm. There is some consistency among regulators for the level of gearing adopted, which is, in most cases, 60%. Utility firms with such a capital structure are generally taken, by regulators, to have a BBB- to BBB+ credit rating (based on Standard & Poor's credit rating system). The DRP is benchmarked against firms of similar perceived risk.

### 4.2 The SA Water PD 2013

#### 4.2.1 Benchmark firm

In the SA Water PD 2013, the Commission calculated the cost of debt assuming an efficient stand-alone utility business, based on a BBB credit rating and 60% gearing ratio. A 60% gearing ratio reflected the level of debt which an efficient benchmark utility firm would carry.

#### 4.2.2 Term structure assumptions

The Commission calculated the DRP based on a bond with a remaining term to maturity of 10 years, with yields extrapolated from the Bloomberg BBB 7-year Fair Value Curve (**FVC**). There were insufficient trades of BBB 10-year bonds to enable the DRP to be estimated directly from those bonds.

#### 4.2.3 Averaging period

A 20 day averaging period was used for determining the risk-free rate and DRP.

#### 4.2.4 Cost of debt (calculated)

The cost of debt was derived as a point estimate equalling the risk-free rate plus the DRP. The Commission did not add a margin to the DRP to reflect the transaction costs that SA Water would incur when raising debt. The cost of debt was calculated immediately prior to the commencement of the regulatory period.

### 4.3 Current regulatory practice

#### 4.3.1 Benchmark firm

In general, other regulators define a benchmark firm as a market-listed business that operates in a competitive market and faces similar risks to the regulated business. There are, however, some subtle but important variations amongst regulators.

IPART has only recently adopted the definition above, having previously regarded a benchmark firm as a “new” entrant. The change in approach is consistent with IPART’s decision to extend the averaging period it applies to the components of the DRP, and is further justified by the fact that new entry is rare in practice. It is therefore difficult to infer efficient financing strategies for a new entrant from observed behaviour.<sup>28</sup>

The AER and ERA prefer to restrict the benchmark entity to a pure play, regulated business operating within Australia. The ERA further specifies that the benchmark firm should be without parental ownership – to avoid the dilution or transfer of any systematic risks from the parent to the subject business.<sup>29</sup>

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<sup>28</sup> IPART, *Review of WACC Methodology: Research – Final Report*, December 2013 (available at [http://www.ipart.nsw.gov.au/Home/Industries/Research/Reviews/WACC/Review\\_of\\_method\\_for\\_determining\\_the\\_WACC/Dec\\_2013\\_-\\_Release\\_Final\\_Report/Final\\_Report\\_-\\_Review\\_of\\_WACC\\_Methodology\\_-\\_December\\_2013](http://www.ipart.nsw.gov.au/Home/Industries/Research/Reviews/WACC/Review_of_method_for_determining_the_WACC/Dec_2013_-_Release_Final_Report/Final_Report_-_Review_of_WACC_Methodology_-_December_2013)).

<sup>29</sup> ERA, *Weighted Average Cost of Capital for the Freight and Urban Rail Networks Draft Determination*, June 2014, p.21 (available at <http://www.erawa.com.au/cproot/12579/2/Draft%20Determination%20-%202014%20Review%20of%20Method%20for%20Estimating%20the%20Weighted%20Average%20Cost%20of%20Capital%20for%20Railway%20Networks-1.pdf>).

The ACT's ICRC departs from standard practice, preferring to use a firm-specific approach rather than a benchmark firm, attempting to measure the ACT electricity distributor's (ACTEW's) true cost of capital directly.

The assumption of 60% debt is, in practice, universally applied among interstate regulators of water utilities.

The credit rating BBB band from an international rating agency such as Standard and Poor's or Moody's is also universally applied by interstate water regulators.

#### 4.3.2 Term structure assumptions

The majority of interstate regulators which base their decisions on a benchmark firm, use yields from four-year or five-year corporate bonds for the estimation of the debt risk premium.

#### 4.3.3 Averaging period

As discussed in section 2.3, only the AER adopts a 10-year trailing average approach, although IPART utilises a hybrid 40-day and 10-year approach. All other regulators use a short-term average approach of either 20 or 40 days.

#### 4.3.4 Cost of debt (calculated)

Although the core methodology of the cost of debt equalling the risk-free rate plus the DRP is adopted nationwide, aspects of the methodologies for calculating the cost of debt are not uniform among interstate regulators.

IPART sets the cost of debt at the beginning of each regulatory period and does not adjust it until the following regulatory period. IPART also incorporates an allowance of 12.5 bps for debt raising cost, which is down from 20 bps following its change from a five-year, to a 10-year target term to maturity.<sup>30</sup> IPART has expressed a preference for utilising the RBA's series of credit spreads to estimate the DRP.<sup>31</sup>

The AER's allowed return on debt is derived as a point estimate. As it has moved towards gradual implementation of 10 year trailing averages, the AER will update the trailing DRP every year of the regulatory period, using published yields from an independent third party data service provider. The adoption of 10 year trailing averages marks a departure from the AER's previous practice of using a 20 day averaging period and, therefore, the AER proposes to transition to it over a 10 year period.<sup>32</sup>

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<sup>30</sup> See IPART, *Review of WACC Methodology: Research – Final Report*, December 2013, p.23.

<sup>31</sup> See IPART, *Review of WACC Methodology: Research – Final Report*, December 2013, p.14.

<sup>32</sup> See AER, *Better Regulation: Rate of Return Guideline*, December 2013, p.19, (available at <http://www.aer.gov.au/sites/default/files/AER%20Rate%20of%20return%20guideline%20-%20December%202013.pdf>).

The ERA incorporates an allowance for administrative costs associated with issuing debt.<sup>33</sup> The ERA uses a bond yield approach based exclusively on yield data from the Bloomberg data service. The sample bonds:

- ▲ are only issued in Australia by Australian companies and denominated in Australian dollars
- ▲ are either fixed or floating rate
- ▲ have a time to maturity of at least two years
- ▲ have at least a sample size of 10, and
- ▲ can include callable/putable redemptions.

The QCA has based its cost of debt calculations in recent determinations on a 10-year bond, extrapolated from the Bloomberg BBB 7-year fair value curve.<sup>34</sup> However, the QCA has indicated a move to the RBA's estimates of non-financial corporate yields.<sup>35</sup> The QCA also includes an allowance for annual debt issuance costs.

The ESCV estimates the debt risk premium based upon a 10-year BBB+ bond. This was extrapolated from the Bloomberg BBB 7-year FVC, using a paired bond approach.<sup>36</sup>

## 4.4 Commission's considerations

### 4.4.1 Benchmark firm

The Commission proposes to continue to calculate the cost of debt assuming an efficient stand-alone utility business, based on a BBB credit rating and 60% gearing ratio. This approach does not necessarily assume that the efficient utility is a new entrant.

The assumption of a benchmark efficient utility with a credit rating of BBB is consistent with general regulatory practice (as used by Standard and Poor's corporate credit rating system).

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<sup>33</sup> ERA, *Weighted Average Cost of Capital for the Freight and Urban Rail Networks Draft Determination*, June 2014, p.51, (available at <http://www.erawa.com.au/cproot/12579/2/Draft%20Determination%20-%202014%20Review%20of%20Method%20for%20Estimating%20the%20Weighted%20Average%20Cost%20of%20Capital%20for%20Railway%20Networks-1.pdf>).

<sup>34</sup> QCA, *Issues Paper: Trailing average cost of debt*, March 2014, p.20, (available at <http://www.qca.org.au/getattachment/e12f3e72-d72b-451b-83d0-525c7607ef89/Issues-Paper-Trailing-Average-Cost-of-Debt.aspx>).

<sup>35</sup> See QCA, p.22.

<sup>36</sup> ESCV, *Estimating a debt risk premium*, 11 June 2013, (available at [http://www.esc.vic.gov.au/getattachment/4ae557f3-f389-439b-aa0f-35ffb1d1520d/Greater-Metropolitan-water-price-review-2013-1-\(3\).pdf](http://www.esc.vic.gov.au/getattachment/4ae557f3-f389-439b-aa0f-35ffb1d1520d/Greater-Metropolitan-water-price-review-2013-1-(3).pdf)).

#### 4.4.2 Term structure assumptions

The Commission proposes to use four-year bonds as the benchmark, for the reasons discussed in section 2.4.1 and to maintain internal consistency.

#### 4.4.3 Averaging period

As discussed previously, the Commission proposes to utilise a 20 day averaging period for the DRP (and risk-free rate).

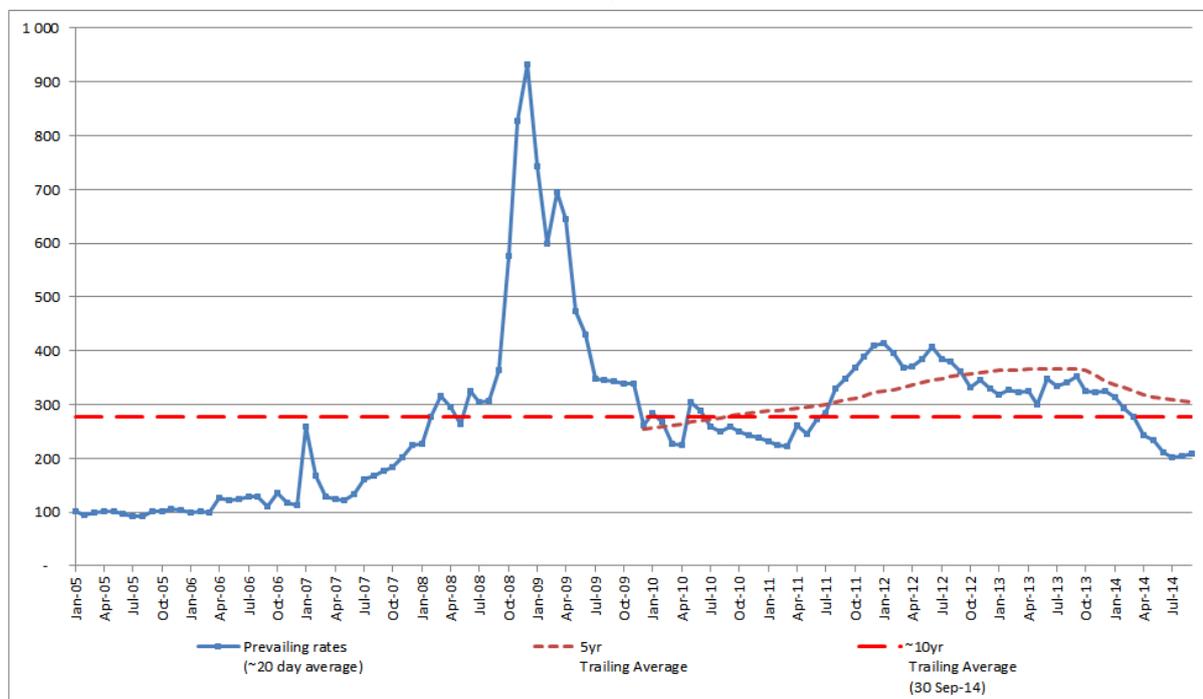
It is important to highlight the implications of that approach in the context of the DRP, which can vary markedly depending on the use of a short-term or long-term approach.

Figure 4.1 shows the volatility in the DRP under a 20-day averaging approach compared to five year and 10 year averages, based on four-year BBB corporate bonds. Corporate bond yields are currently well below the 10 year average and any move from the current short-term approach to a long-term approach would result in a substantial increase in the regulatory rate of return.

In particular, based on current market data and keeping all other parameters constant, the 10-year approach would deliver a post-tax real rate of return of 5.77% (compared to the current post-tax real rate of return of 4.50% determined for the SA Water PD 2013).

Maintaining a 20-day approach would lead to a rate of return of 3.83%.

**Figure 4.1: Debt risk premium under short-term and long-term averaging approaches (basis points)**



Source: Reserve Bank of Australia

The step-change in the rate of return, and prices, that would result from the introduction of a long-term averaging approach was recognised by the AER when it proposed the introduction of a 10-year trailing average approach. The AER has sought to address that impact by transitioning towards that approach over a 10-year period to smooth out the price impacts to customers.

If the Commission were to move to a 10-year trailing average approach, it would also need to think carefully about how to manage the windfall gain that would be received by SA Water from that shift and the potential price shocks that would be experienced by its customers. Those impacts could be managed immediately if the Treasurer were to change the value of SA Water's regulatory asset base, to offset the increase in the rate of return. Such a change is contemplated under the terms of the current Pricing Order. In the absence of such a response by the Treasurer, the Commission would, as a minimum, ensure that any transition to a long-term approach was done slowly, as proposed by the AER.<sup>37</sup>

However, as explained earlier, at this time the Commission's draft proposal is to adopt a 20-day averaging period, which retains consistency with its current approach and with most other regulatory decisions. Potential price shocks to customers, and windfall gains to SA Water, are avoided under that approach.

#### 4.4.4 *Cost of debt (calculated)*

While IPART adds a transaction cost margin to the DRP, the Commission is not persuaded that such a margin is appropriate for SA Water. There is no evidence to suggest that an additional allowance is necessary to reflect SA Water's efficient debt raising costs.

The Commission supports the use of RBA bond yield data to estimate the DRP, on the basis that it is considered to be generally robust and avoids the extrapolation problem associated with the Bloomberg FVC (as discussed in section 4.2.2).

The Commission notes that, if the RAB was not adjusted to compensate for any movements in the rate of return, the movement to a 10 year trailing average would produce a windfall gain to SA Water and the Government (via dividend and tax cash flows), on the basis that the long-term historic cost of debt is higher than the current market-based cost. Some form of transitional arrangement similar to that proposed by the AER would be necessary in that case. However, on the basis that the RAB will be adjusted to reflect that movement, no such arrangement is necessary.

The Commission has calculated the nominal cost of debt as the sum of the nominal risk-free rate (2.87%) and the DRP (1.69%). This produces a nominal cost of debt of 4.56%. The Commission has applied this value in calculating a nominal post-tax WACC which has then been deflated to a real pre-tax WACC using the Fisher equation.

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<sup>37</sup> AER, *Better Regulation: Rate of Return Guideline*, December 2013, p.19.

***Draft Position:***

***The Commission's draft proposal is that the cost of debt should be calculated assuming an efficient stand-alone utility business, based on a BBB credit rating and 60% gearing ratio.***

***The debt risk premium should be calculated using four-year bonds, based on published RBA bond yield data averaged over a 20-day period. The current estimate of the debt risk premium is 1.69%.***

***The combination of the nominal risk-free rate of 2.87% and the debt risk premium of 1.69% produces an estimated nominal cost of debt of 4.56%.***

## 4.5 Sensitivity analysis

A change in the gearing ratio has an inverse effect on the overall rate of return: when holding all other inputs constant, a movement in the gearing ratio of 1% (100 basis points) results in a -0.03% change in the rate of return.

The DRP has a material effect on the overall rate of return: when holding all other inputs constant, a 1% (100 basis points) change in the DRP results in a +0.6% change in the rate of return.

## 5. COST OF EQUITY

### 5.1 Introduction

The cost of equity, which the Commission will determine through the CAPM framework, is defined as the sum of the returns available on a risk-free asset and the premium required to accept the risks associated with equity:

$$k_e = r_f + \beta_L \times \text{MRP}$$

where:

$k_e$  = the cost of equity

$r_f$  = the risk-free rate

$\beta_L$  = the levered or equity beta which reflects the systematic risk of an equity, and

MRP = the expected market risk premium (that is, the expected total market return less the risk-free rate).

Of the CAPM parameters, only  $\beta_L$  is specific to a particular equity – all other inputs are economy-wide factors that affect the required rate of return on all assets. By definition, beta is the extent to which the returns from a firm's equity will co-vary with the returns from the market. Assuming equal gearing, an asset with  $\beta_L$  of one (i.e.  $\beta_L = 1$ ) implies that the asset's returns will move or co-vary equally with the market. A  $\beta_L$  of less than one denotes that the returns of the equity are less risky relative to market returns and a  $\beta_L$  greater than one infers that the equity's returns are more risky relative to market returns.

It should be noted that investors can eliminate much of the risk associated with a particular equity by holding that equity as part of a portfolio. As this portion of risk can be eliminated at little cost, this portion of risk—often termed 'diversifiable' (or 'unsystematic') risk—is not compensated for in a competitive capital market.

Only the remaining risk—the non-diversifiable or systematic risk—is reflected in the cost of equity.<sup>38</sup> The non-diversifiable (systematic) risk reflects the variation in returns to a firm's equity holders that is related to movements in overall market returns of equity and, as such, tends to reflect the variation in returns associated with market-wide factors, such as economic cycles.

A 1% increase in the cost of equity would produce a 0.4% increase in the regulatory rate of return, given the proposed gearing ratio.

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<sup>38</sup> The CAPM provides an estimate of the return required to compensate for the non-diversifiable component of risk only. However, the conclusion that no compensation should be provided for diversifiable risk is relevant to all of the models from finance theory that could be used to estimate costs of capital.

## 5.2 The SA Water PD 2013

In the SA Water PD 2013, the Commission relied largely on regulatory precedent and stability of regulatory approach to estimate the cost of equity. The Commission’s decision on the various parameters that made up the cost of equity in that determination is summarised in Table 5.1.

**Table 5.1: Commission’s decisions on cost of equity in the SA Water PD 2013<sup>39</sup>**

PARAMETER	COMMISSION’S FINAL DECISION
Market risk premium	6%
Equity beta	0.80
Nominal risk-free rate	3.25%
<b>Nominal cost of equity</b>	<b>8.05%</b>

### 5.2.1 Market risk premium

The market risk premium was set at 6% on the basis that it was consistent with regulatory precedent and was consistent with the Commission’s 2012 Final Advice to the Treasurer on SA Water’s regulatory rate of return.

In its 2012 advice, the Commission noted that adjustments to the market risk premium should not be made on the basis of short-term fluctuations in market conditions, and that it is important to take a long-term view given the longer-term impacts of regulatory decisions on investment incentives. Accordingly, the market risk premium should only be reviewed if there is sufficient evidence to demonstrate that there has been a “structural break” in the market.

Given that no evidence had arisen to warrant a revision to the market risk premium, the Commission recommended that the market risk premium should be set at 6% on the basis that it was consistent with Australian regulatory and market practice, and that it was well within the range provided by historic estimates.

### 5.2.2 Equity beta ( $\beta_L$ )

The Commission’s SA Water PD 2013 set the  $\beta_L$  for an efficient benchmarked water utility operating in South Australia at 0.80, consistent with regulatory precedent.

In its Final Advice to the Treasurer published in February 2012, the Commission expressed the view that regulatory stability was important and departures from accepted regulatory practice should only be made when context, logic or evidence strongly warranted such a decision. Further, it noted that there was a lack of consensus between Australian regulators

<sup>39</sup> Essential Services Commission of South Australia, *SA Water’s Water and Sewerage Revenues 2013/14 – 2015/16 Final Determination – Statement of Reasons*, May 2013.

to uniformly agree on a single value for the  $\beta_L$  and problems associated with using empirical data of comparable overseas water utilities and Australian energy utilities to infer a  $\beta_L$  for a South Australian water utility.

To ensure longer-term certainty for investment, the Commission recommended that the appropriate  $\beta_L$  for an efficient benchmarked water utility in South Australia should be set at 0.80 on the basis that it was largely consistent with the relevant decision of other Australian regulators—that is, it was either the explicit value adopted or fell within the fair and reasonable range of values determined by other regulators.

### 5.3 *Current regulatory practice*

Australian regulators have applied different methodologies to estimate both the market risk premium and  $\beta_L$  and there is no consensus on the best methodology. Each methodology has advantages and disadvantages that make it suitable for certain situations and unsuitable for others.

The sections below summarise the different values for market risk premium and  $\beta_L$  adopted by Australian regulators in recent decisions, and the methodologies used to estimate those values.

#### 5.3.1 *Market risk premium*

The evidence in relation to the market risk premium continues to be the subject of debate and academic studies have not arrived at a consensus regarding the most appropriate methodology. As a result, Australian regulators have generally relied on a combination of historical and forward-looking indicators to form a judgement on a suitable market risk premium.

Table 5.2 provides a summary of recent decisions made on the market risk premium by other Australian regulators, and the types of evidence used in support of their decisions. The Commission notes that the market risk premium of 6% is widely used by Australian regulators although some recent decisions have either incorporated 6% as its midpoint or adopted a slightly higher value.

The QCA decision on the regulatory rate of return noted that the long-run average of market risk premium was 6%. However, it argues that current market conditions provide support for a higher value and concluded that its estimate of the market risk premium of 6.5% was a reasonable estimate at the time of its decision.

**Table 5.2: Recent Australian regulatory decisions on market risk premium<sup>40</sup>**

REGULATORY DECISION		MARKET RISK PREMIUM	DATA SOURCE					
			Historical averaging	Academic research	Survey evidence	Expert advice	Regulatory precedents	Others
<b>AER</b>	Gas Access Arrangement: APA GasNet Australia (2013)	6%	×	×	×	×	×	Considered Australian Competition Tribunal decisions
<b>ERA</b>	Water Corporation, Aqwest and the Busselton Water Board (2013)	6%	×		×		×	Considered financial market developments
<b>ESCV</b>	Price Review 2013: Greater Metropolitan Water Businesses (2013)	6%			×		×	ACCC's Water Charge (Infrastructure) Rules require an MRP of 6% to be applied for Victorian businesses operating in the Murray-Darling Basin.
<b>ICRC</b>	ACTEW Regulated Water and Sewerage Services Prices (2008)	6%						
<b>IPART</b>	Hunter Water Corporation (2013)	Current market data: 7.6% Long-term averages: 5.5% to 6.5%	×					Based on 40-day average of the implied market risk premium from Bloomberg
<b>QCA</b>	Cost of capital: market parameters (2014)	6.5%	×		×	×		

<sup>40</sup>

Source:

AER, *Access Arrangement APA GasNet Australia (Operations) Pty Ltd 2013-17 - Final Decision*, March 2013;

ERA, *Inquiry into the Efficient Costs and Tariffs of the Water Corporation, Aqwest and the Busselton Water Board – Revised Final Report*, 23 March 2013;

ESCV, *Price Review 2013: Greater Metropolitan Water Businesses – Final Decision*, June 2013;

ICRC, *Regulated Water and Sewerage Services 1 July 2013 to 30 June 2019 – Final Report*, June 2013;

IPART, *Hunter Water Corporation's water, sewerage, stormwater drainage and other services: Review of prices from 1 July 2013 to 30 June 2017 – Final Report*, June 2013;

QCA, *Cost of capital: market parameters – Final Decision*, August 2014.

### 5.3.2 Equity beta ( $\beta_L$ )

In practice, the estimation of a  $\beta_L$  for an entity generally requires undertaking econometric analysis of equity returns of publicly-listed ‘comparator’ companies. However, a  $\beta_L$  observed or estimated in this manner is subject to substantial statistical uncertainty, and may be imprecise, as well as being volatile and unstable over time. Selecting an appropriate proxy also becomes particularly challenging if the Australian publicly-listed or overseas-listed utilities are not directly comparable to an efficient benchmark utility.

Although the regulatory decisions provided in Table 5.3 do not uniformly agree on a single value for  $\beta_L$ , there are broadly two categories of decisions: those that are heavily weighted towards empirical evidence and firm specific characteristics, producing estimates of around 0.60 – 0.70; and those that place less weight on empirical evidence and more weight on regulatory stability, producing estimates of around 0.80.

**Table 5.3: Recent Australian regulatory decisions on equity beta<sup>41</sup>**

REGULATORY DECISION	EQUITY BETA	GEARING
<b>AER:</b> Gas Access Arrangement: APA GasNet Australia (2013)	0.80	60%
<b>ERA:</b> Water Corporation, Aqwest and the Busselton Water Board (2013)	0.65	60%
<b>ESCV:</b> Price Review 2013: Greater Metropolitan Water Businesses (2013)	0.65	60%
<b>ICRC:</b> ACTEW Regulated Water and Sewerage Services Prices (2008)	0.90 <sup>42</sup>	60%
<b>IPART:</b> Hunter Water Corporation (2013)	0.60 – 0.80	60%
<b>QCA:</b> Seqwater Irrigation Price Review (2013)	0.66	60%

<sup>41</sup> Source:

AER, *Access arrangement APA GasNet Australia (Operations) Pty Ltd 2013-17 - Final Decision*, March 2013;  
 ERA, *Inquiry into the Efficient Costs and Tariffs of the Water Corporation, Aqwest and the Busselton Water Board – Revised Final Report*, 23 March 2013;  
 ESCV, *Price Review 2013: Greater Metropolitan Water Businesses – Final Decision*, June 2013;  
 ICRC, *Regulated Water and Sewerage Services 1 July 2013 to 30 June 2019 – Final Report*, June 2013;  
 IPART, *Hunter Water Corporation’s water, sewerage, stormwater drainage and other services: Review of prices from 1 July 2013 to 30 June 2017 – Final Report*, June 2013;  
 QCA, *Seqwater Irrigation Price Review – Final Report*, April 2013.

<sup>42</sup> On 26 June 2013, the ICRC released its Final Report for regulated water and sewerage services in the ACT. In this report, the ICRC departed from its previous practice of setting the cost of equity (and equity beta) based on the CAPM.

## 5.4 Commission's considerations

In line with general regulatory practice, the Commission believes that adjustments to the parameters of SA Water's regulatory rate of return should only be made if there is evidence to suggest that the current values no longer reflect the market's longer-term expectations for the market risk premium and  $\beta_L$  and not short-term fluctuations in market conditions.

Using this as a starting principle, the Commission's consideration of matters related to the market risk premium and  $\beta_L$  is set out below.

### 5.4.1 Market risk premium

The market risk premium is the expected market return above the risk-free rate (that is, the excess returns earned by investors). The market risk premium is a forward-looking estimate and cannot be directly observed. Changes to the market risk premium can significantly influence the final rate of return figure.

For regulatory purposes, adjustments to the market risk premium should only be revised if there is sufficient evidence to demonstrate that there has been a "structural break" in the market. Historical evidence indicates that market risk premium will generally revert back to its long-term average despite deviations in the short term as a result of fluctuations in market conditions.

Recent decisions made by other Australian regulators indicate that 6% continues to represent their best long-term estimate of the market risk premium, and that adjustments are not warranted on the basis that there has not been a fundamental change in market conditions. In reaching this consensus view, regulators have considered different historical and forward-looking indicators such as historical data and survey evidence.

Given that there has been no substantial evidence to show that there has been a fundamental change in market conditions, the Commission's draft proposal is to use a market risk premium of 6% on the basis that it continues to represent the best long-term estimate of market risk premium. This is supported by Australian regulatory precedent, consistency with market practice and historical estimates.

### 5.4.2 Equity beta ( $\beta_L$ )

Under the CAPM, the total risk of an asset consists of systematic and non-systematic risk. While the former risk is a function of broad economic factors and therefore cannot be eliminated by portfolio diversification, the latter relates to the attributes of a particular equity asset and can be managed by portfolio diversification.

In the CAPM, the equity value reflects the measure of the risk arising from exposure to the return to equity of a particular firm. To determine the  $\beta_L$  value, the business environment in which the firm operates in, and the level of gearing are considered.

The Commission's assessment of recent regulatory decisions indicates that Australian regulators do not uniformly agree on a single value for the  $\beta_L$  because of the different weightings being applied towards empirical evidence and firm-specific characteristics, resulting in estimates ranging from 0.60 to 0.80.

Regulatory decisions that have resulted in  $\beta_L$  values that are at the lower bound of the range were primarily based around empirical estimates. Both the QCA and ESCV regulatory decisions were underpinned by benchmarking studies of comparable overseas and Australian firms. However, the Commission does not propose to rely on those studies, as the  $\beta_L$  estimates produced in those studies were based on outcomes in other industries and were mainly based on overseas observations. Given that the sample size of those studies were largely made up of overseas water businesses and few Australian businesses, there is the potential for incomparability between  $\beta_L$  of overseas utilities with Australian utilities, and the appropriateness of using empirical data for Australian energy businesses to infer a  $\beta_L$  for a South Australian water utility.

Conversely, IPART's decision to use a  $\beta_L$  of 0.70 (representing the mid-point of its estimated range of 0.60 to 0.80) was based on its previous firm-specific considerations of the systematic risk profile of Sydney Desalination Plant in the 2012 price review. IPART subsequently adopted the same  $\beta_L$  estimate of 0.70 in the Hunter Valley's price review on the basis that it did not consider Hunter Water's systematic risk profile to be any different to the Sydney Desalination Plant.

In December 2013 the AER flagged its intention to use a range from 0.4 to 0.7 for all the entities it regulates<sup>43</sup>, but in its January 2014 final decision on SP AusNet, continued to utilise a  $\beta_L$  of 0.8.<sup>44</sup>

On the issue of firm-specific consideration of the systematic risk profile of a South Australian water utility, the Commission is also mindful of the fact that the South Australian regulatory regime is distinctly different from other comparable regimes. This is because SA Water is to be regulated under a revenue cap form of price control. The consequence of this form of price control is that SA Water faces significantly lower demand risk compared to other regulated water utilities as it is guaranteed fixed revenue streams for its water and sewerage services. This is different to the approach that was used in the SA Water PD 2013, which exposed SA Water to demand risk through the adoption of average revenue caps. The change in regulatory environment, which reduces risk to SA Water, therefore lends weight to the argument for a reduction in SA Water's current  $\beta_L$  value of 0.80.

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<sup>43</sup> AER, *Better Regulation, Rate of Return Guideline*, December 2013, p.15, (available at <http://www.aer.gov.au/sites/default/files/AER%20Rate%20of%20return%20guideline%20-%20December%202013.pdf>).

<sup>44</sup> AER, *Final Decision, SP AusNet Transmission determination 2014-15 to 2016-17*, p.22, (available at <http://www.aer.gov.au/sites/default/files/AER%20final%20decision%20for%20SP%20AusNet%27s%202014-17%20regulatory%20control%20period%20-%202014%20January%202014.pdf>).

There is, however, a practical problem associated with measuring the impact of the changed regulatory environment on SA Water’s  $\beta_L$ . In the absence of any meaningful way to make such an adjustment, the Commission proposes to continue to adopt a  $\beta_L$  of 0.8, having regard to regulatory precedent.

**Draft Position:**

***The Commission proposes to adopt a market risk premium of 6% and an equity beta of 0.8.***

**5.4.3 Cost of Equity (calculated)**

The Commission has calculated a nominal cost of equity of 7.67%. This was derived using the following CAPM equation and parameters:

$$k_e = r_f + \beta_L \times \text{MRP}$$

where:

- $r_f$  = the nominal risk-free rate, was determined to be 2.87% as set out in section 2.4
- $\beta_L$  = the levered equity beta, was determined to be 0.8 as set out in section 5.4.2
- MRP = the expected market risk premium, was determined to be 6% in section 5.4.1

**Draft Position:**

***The Commission’s draft proposal is that the cost of equity should be determined using the capital asset pricing model.***

***The current estimate of the nominal risk-free rate is 2.87%.***

***The current estimate of the market risk premium is 6%.***

***The current estimate of the equity beta is 0.8.***

***The application of the capital asset pricing model using the above values produces an estimated nominal cost of equity of 7.67%.***

**5.5 Sensitivity analysis**

The MRP has a material effect on the overall rate of return: when holding all other inputs constant, a 1% (100 basis points) change in the MRP equates approximately to a 0.3% change in the rate of return.

The  $\beta_L$  also has a material effect on the overall rate of return: when holding all other inputs constant, a movement in the  $\beta_L$  of 0.1 equates to a 0.2% change in the rate of return.

## 6. TAXATION AND THE VALUE OF IMPUTATION CREDITS

### 6.1 Introduction

In estimating the value of the allowance for tax paid, the Commission will adopt the following principles and guidelines:

- ▲ The allowance for tax paid will be determined as a separate building block and not in the regulatory rate of return (WACC), consistent with the approach of adopting a post-tax regulatory rate of return.
- ▲ The assessed SA Water forecast tax liability will be adjusted for the value generated by the distribution of imputation credits (i.e., adjusted for gamma ( $\gamma$ )).
- ▲ The value of the distribution of imputation credits will have regard to regulatory precedent.

In relation to tax, this Chapter only deals with the derivation of the value of imputation credits, or gamma ( $\gamma$ ), as in some applications of WACC, gamma can be a component of the WACC formula. That is, in a post-tax approach,  $\gamma$  is accounted for in the tax allowance of the building block approach and not in the regulatory rate of return.

The requirement to calculate  $\gamma$  arises from Australia's dividend imputation system. Companies pay corporate tax on their incomes. However, under Australia's dividend imputation system, shareholders receive imputation credits on corporate taxes paid which reduce shareholders' tax liabilities.

The interest paid by a company is tax deductible. Until 1987, dividends paid to shareholders were not tax deductible and, hence, suffered from double-taxation; that is, the income of the company was taxed at the corporate tax rate and any dividends were subsequently taxed at the individual shareholder level. This created a bias towards debt funding. In 1987, the Commonwealth Government introduced a dividend imputation tax system. Under this system, tax credits (called franking credits) are attached to dividends paid out. Those credits remove the double-taxation problem by providing a tax credit in respect of the company tax paid by the company.

Imputation tax credits provide a benefit for eligible investors in addition to any capital gains or dividend income acquired through their investments. The implication of this for regulatory rate of return calculations is that investors who are entitled to these credits may be willing to accept an investment with a lower return than would be the case were no tax credits available.

## 6.2 The SA Water PD 2013

In the SA Water PD 2013, the Commission determined a  $\gamma$  value of 0.5 and arrived at the tax allowance using the following methodology:

- ▲ forecasting revenues from all sources including tariffs, CSOs and contributed assets
- ▲ forecasting the tax depreciation expense of the tax value of the regulatory assets inclusive of all capital expenditures (including contributed assets), determined on a straight-line basis in a similar manner to the regulatory depreciation but using tax asset lives
- ▲ forecasting the nominal tax liability after consideration of the expected revenues less opex, tax depreciation and benchmark interest costs
- ▲ adjusting the liability for the value of imputation credits adjusted for  $\gamma$ , and
- ▲ converting the  $\gamma$ -adjusted tax liability from a nominal value to a real value.

## 6.3 Current regulatory practice

Table 6.1 lists recent  $\gamma$  values adopted by a selection of Australian regulators.

**Table 6.1: Recent gamma values ( $\gamma$ ) adopted by Australian regulators**

ESCOSA (SA) <sup>45</sup>	IPART (NSW) <sup>46</sup>	ESCV (VIC) <sup>47</sup>	QCA (QLD) <sup>48</sup>	ERA (WA) <sup>49</sup>	AER <sup>50</sup>
0.5	0.25	0.5	0.5	0.25 to 0.39	0.5

<sup>45</sup> Essential Services Commission of South Australia, *SA Water's Water and Sewerage Revenues 2013/14 – 2015/16, Final Determination, Statement of Reasons*, May 2013, (available at [http://www.escosa.sa.gov.au/library/130527-SAWater\\_Water\\_SewerageRevenues\\_2013-16-FinalDetermination-StatementOfReasons\\_0.pdf](http://www.escosa.sa.gov.au/library/130527-SAWater_Water_SewerageRevenues_2013-16-FinalDetermination-StatementOfReasons_0.pdf).)

<sup>46</sup> IPART, *Review of Imputation Credits (Gamma), Research, Final Decision*, March 2012. Refer also to IPART, *Spreadsheet of WACC model-February 2014*, (available at [http://www.ipart.nsw.gov.au/Home/Industries/Research/Market\\_Update/Spreadsheet\\_of\\_WACC\\_model\\_-\\_February\\_2014](http://www.ipart.nsw.gov.au/Home/Industries/Research/Market_Update/Spreadsheet_of_WACC_model_-_February_2014) which employs gamma=0.25. Prior to 2012, IPART used a mid-point estimate of 0.4 (within the range of 0.5 to 0.3) [IPART, *Review of imputation credits (gamma), Analysis and Policy Development, Discussion Paper*, December 2011]).

<sup>47</sup> ESCV, *Price review 2013: Greater Metropolitan Water Businesses, Final Decision*, June 2013, p. 110.

<sup>48</sup> QCA, *SEQ Interim Price Monitoring for 2010/11, Part B-Detailed Assessment, Draft Report*, February 2011.

<sup>49</sup> ERA, *Rate of Return Guidelines, Meeting the Requirements of the National Gas Rules*, 16 December 2013, p. 31, (available at <http://www.erawa.com.au/cproot/11953/2/Rate%20of%20Return%20Guidelines.PDF>). Given a payout ratio of 0.70, the ERA considers the estimated range for gamma is 0.25 to 0.39.

<sup>50</sup> AER, *Better Regulation, Rate of Return Guideline, Explanatory Statement*, December 2013, p. 159. The AER proposes to adopt a gamma of 0.5 as a reasonable estimate of the value of imputation tax credits, based on a payout ratio of 0.7 and a utilisation rate of 0.7 (p. 23). Prior to this development, the AER was compelled to use a value for gamma of 0.25 as a result of a 2011 decision of the Australian Competition Tribunal.

## 6.4 Commission's considerations

Based on Table 6.1, regulatory precedent indicates a gamma ( $\gamma$ ) value ranging from between 0.25 to 0.5.

Gamma ( $\gamma$ ) is usually defined as the product of the distribution ratio (**F**)<sup>51</sup> and the utilisation rate (**theta,  $\Theta$** ):

$$\gamma = F \times \Theta$$

where:

**F** is the value of imputation credits distributed by a firm as a proportion of the value of imputation credits generated by it in the period.

**$\Theta$**  is the value of imputation credits distributed to investors as a percentage of their face value.<sup>52</sup>

Recent research provides some evidence supporting a distribution ratio (**F**) of around 0.85, rather than the generally employed figure of 0.70. From a range of potential values this research also argues that an utilisation rate ( **$\Theta$** ) of 0.80 is appropriate.<sup>53</sup> Employing the above equation, this recent research suggests a value for  $\gamma$  in the order of 0.7; that is,  $0.85(F) * 0.80(\Theta) = 0.68$ .

Whilst this recent credible research indicating a potential gamma ( $\gamma$ ) value of 0.7 is noted, the Commission would not propose to adopt such a value in the absence of further supporting studies and some level of consensus amongst regulators that this is an appropriate value.

The value of gamma ( $\gamma=0.5$ ) adopted for the SA Water PD 2013 remains within the regulatory range of 0.25 to 0.5 identified in Table 6.1.

The Commission therefore proposes to continue to employ a gamma ( $\gamma$ ) of 0.5, consistent with the value it adopted for the SA Water PD 2013.

**Draft Position:**

**The Commission proposes to adopt a gamma ( $\gamma$ ) of 0.5.**

<sup>51</sup> Sometimes referred to as the payout ratio.

<sup>52</sup> IPART, *Review of imputation credits (gamma), Research-Final Decision*, March 2012, p.5, (available at [http://www.ipart.nsw.gov.au/Home/Industries/Research/Reviews/Imputation\\_Credits\\_Gamma/Review\\_of\\_Imputation\\_Credits\\_-\\_Gamma/14\\_Mar\\_2012\\_-\\_Release\\_Final\\_Ddecision/Final\\_Ddecision\\_-\\_Review\\_of\\_imputation\\_credits\\_-\\_gamma\\_-\\_March\\_2012](http://www.ipart.nsw.gov.au/Home/Industries/Research/Reviews/Imputation_Credits_Gamma/Review_of_Imputation_Credits_-_Gamma/14_Mar_2012_-_Release_Final_Ddecision/Final_Ddecision_-_Review_of_imputation_credits_-_gamma_-_March_2012)).

<sup>53</sup> Lally, M., *Estimating gamma*, School of Economics and Finance, Victoria University of Wellington, 25 November 2013, (available at <http://www.qca.org.au/getattachment/6c6cc6d0-1130-47b3-83de-193999847f8d/Lally,-M,-Estimating-Gamma.aspx>).

## 6.5 *Sensitivity analysis*

A  $\gamma$  of 0.50 would result in a lower revenue cap than setting a  $\gamma$  of 0.25. For example, using the determined drinking water services revenues for 2013/14 and employing a  $\gamma$  of 0.25 rather than 0.5 would result in a tax allowance of \$34.6 million instead of \$21.0 million; representing an increase in the revenue cap of 1.8%.

Alternatively, employing a  $\gamma$  of 0.7 would result in a tax allowance for drinking water services (2013/14) of \$11.8 million, resulting in a decrease in the revenue cap of 1.2% compared to using a  $\gamma$  of 0.5.

## 7. REGULATORY RATE OF RETURN

### 7.1 *Summary of draft WACC positions*

Combining each of the inputs discussed in the preceding chapters, the Commission has calculated a post-tax real rate of return of 3.83%. This is based on a 20-day averaging period and four-year term to maturity of underlying securities which, on the balance of evidence, the Commission believes are appropriate. The Commission has noted the debate on those parameters and highlights, in Table 7.1 below, the rate of return that would result under an alternative (high-case) scenario, where a 10-year averaging period and four-year term to maturity is adopted. As discussed previously, the revenue and price impacts from moving to the high-case approach would require careful consideration.

The Commission will set out its proposed approach to the estimation of the rate of return and update that calculation for the Final Report to be submitted to the Treasurer. In doing so, the Commission may change the proposed approach based on submissions received in response to this Draft Report and any new evidence that comes to light.

The Commission will ultimately determine the regulatory rate of return to apply to SA Water during the process of making the SA Water PD 2016.

A summary of the Commission's draft positions on the constituent parameters of the WACC and resulting regulatory rates of return is set out in Table 7.1 below. The WACC parameters from the Commission's SA Water PD 2013 are also provided for comparison.

**Table 7.1: Proposed regulatory rate of return for SA Water (indicative)  
compared with the SA Water PD 2013**

PARAMETER	SA WATER PD 2013	INPUT (LOW CASE)	INPUT (HIGH CASE)	DATA SOURCE
Averaging period	20 days	20 days	10 years	Regulatory precedent
Term to maturity of underlying securities	10 years	4 years	4 years	Regulatory precedent
Nominal risk-free rate	3.25%	2.87%	4.62%	RBA
Credit rating	BBB	BBB	BBB	Regulatory precedent
Gearing	60%	60%	60%	Regulatory precedent
Debt risk premium	2.80%	1.69%	3.35%	RBA
Equity beta	0.8	0.8	0.8	Regulatory precedent
Market risk premium	6%	6%	6%	Regulatory precedent
<b>Rates of return (including to debt and equity)</b>				
Cost of debt nominal	6.04%	4.56%	7.98%	Calculated from above
Cost of equity nominal	8.05%	7.67%	9.42%	Calculated from above
WACC nominal	6.85%	5.81%	8.56%	Calculated from above
Inflation forecast	2.24%	1.91%	2.63%	RBA
<b>WACC post-tax real</b>	4.50%	3.83%	5.77%	Calculated from above
<b>Other parameters (as used in the 'building block' calculation of revenues)</b>				
Corporate tax rate	30%	30%	30%	Statutory tax rate
Gamma	0.5	0.5	0.5	Regulatory precedent

## 7.2 Impact on revenue from changes in the rate of return

The Commission has analysed the overall effect on SA Water's total revenues (compared to the SA Water PD 2013) as a result of using the low and high cases for the regulated rates of return from Table 7.1 above. A summary is provided in the table below.

**Table 7.2: Revenue effects of a change in the regulated rate of return over the three year period<sup>54</sup>**

CHANGE IN REVENUE	LOW CASE	HIGH CASE
	(\$Dec-12)	(\$Dec-12)
Change in drinking water revenue	-\$ 144 million	+\$ 290 million
Change in sewerage revenue	-\$ 65 million	+\$ 132 million
<b>Change in total revenue</b>	<b>-\$ 209 million</b>	<b>+\$ 420 million</b>

Table 7.2 above includes changes in total revenues from both drinking water and sewerage services over the original three-year regulatory period. This analysis incorporates the effects arising from the changes to the rate of return (for each of the low and high cases) while holding all other inputs into the SA Water PD 2013 constant.

## 7.3 Summary of the sensitivity of the rate of return

Throughout this document, the Commission has considered the impact of a change in each parameter (holding all other inputs constant) on the resulting rate of return. Table 7.3 below presents the summarised results.

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<sup>54</sup> These values are unsmoothed and are not subject to any discounted cash flow analysis to reflect any net present value basis.

**Table 7.3: Sensitivity of the rate of return resulting from a change in each parameter**

<b>PARAMETER</b>	<b>SIZE OF CHANGE</b>	<b>EFFECT ON THE RATE OF RETURN</b>
Nominal risk-free rate	+1% <i>(100 basis points)</i>	+1.0%
Inflation forecast	+1%	-1.0%
Debt risk premium	+1% <i>(100 basis points)</i>	+0.6%
Gearing	+1% <i>(100 basis points)</i>	-0.03%
Equity beta	+0.1	+0.2%
Market risk premium	+1% <i>(100 basis points)</i>	+0.3%

# APPENDIX 1: SEPTEMBER 2014 PRICING ORDER

## WATER INDUSTRY ACT 2012 (SECTION 35)

### PRICING ORDER

FOR THE REGULATORY PERIOD 1 JULY 2016 – 30 JUNE 2020

#### PREAMBLE

This pricing order has been prepared in order to provide information that would assist SA Water to prepare its Regulatory Business Proposal and the Essential Services Commission of South Australia (ESCOSA) to prepare its Final Framework and Approach in July 2014 and its Draft Determination for SA Water's drinking water and sewerage services for the second regulatory period.

A further pricing order may be issued to vary this pricing order prior to ESCOSA issuing its Final Determination. These variations may be required in response to matters raised by ESCOSA in its Draft Determination or its Final Inquiry Report on water pricing reform once the South Australian Government has considered these matters and developed an appropriate response.

Pursuant to section 35(4) of the *Water Industry Act 2012 (the Act)*, the Treasurer hereby issues the following pricing order (**this Order**):

#### 1. INTERPRETATION

1.1 Where a term used in this Order is defined in the Act, it has the meaning given in the Act.

1.2 In this Order, unless the contrary intention appears:

*determination* means a determination of the Commission under section 35 of the Act and Part 3 of the *Essential Services Commission Act 2002 (the ESC Act)* made in respect of retail services;

*drinking water retail service* means a retail service constituted by the sale and supply of water of a quality fit for human consumption;

*Initial Pricing Order* means the order issued by the Treasurer pursuant to section 35(4) of the Act dated 24 September 2012;

*NWI Pricing Principles* means the National Water Initiative Pricing Principles 2010 agreed by Australian governments as the basis for setting water prices / charges in their jurisdictions, as amended or replaced from time to time;

*NWI Principles for the Recovery of Capital Expenditure* means the Principles for the recovery of capital expenditure which form part of the NWI Pricing Principles, as amended or replaced from time to time;

*NWI Principles for Urban Water Tariffs* means the Principles for urban water tariffs which form part of the NWI Pricing Principles, as amended or replaced from time to time;

*second regulatory period* means the four year period commencing 1 July 2016;

*sewerage retail service* means the sale and supply of sewerage services for the removal of sewage.

## **2. APPLICATION**

- 2.1 This Order is to take effect from the date that it is signed.
- 2.2 This Order is to apply to a determination for the second regulatory period in respect of drinking water retail services and sewerage retail services provided by SA Water, and as such applies in conjunction with the Initial Pricing Order.
- 2.3 Clause 3 of the Initial Pricing Order is varied to include a new subclause 3.3 as follows:

“3.3 In the case of a determination to which any further order made pursuant to section 35(4) of the Act applies, clause 3.1 applies subject to that further order.”
- 2.4 For the avoidance of doubt, the Commission must ensure that any draft of a determination to which this Order will apply and which is provided to any person in accordance with section 26(1) of the ESC Act is prepared consistently with, and complies with, all applicable requirements of the Initial Pricing Order and this Order.

## **3. SA WATER DRINKING WATER AND SEWERAGE RETAIL SERVICES**

The Commission must adopt or apply the following parameters, principles or factors when making a determination to which this Order applies:

- 3.1 The second regulatory period must be adopted as part of the determination.
- 3.2 The determination must only determine the total revenue which may be derived from the provision of drinking water retail services and sewerage retail services.
- 3.3 The determination must apply a separate total revenue control for drinking water retail services and sewerage retail services respectively.
- 3.4 The determination must not establish, or require the establishment of, a revenue control for a drinking water retail service or a sewerage retail service based on customer class or location.
- 3.5 The determination must include a mechanism which allows for the adjustment of the total revenue which may be derived where the Commission determines there to be a relevant and material variation between forecast and actual rates of water consumption or sewerage connections. The adjustment mechanism must operate on the basis of efficient costs associated with variations in demand, and so as to promote a stable price path for retail services.
- 3.6 The determination must include a mechanism which allows for the adjustment of the total revenue which may be derived where the Commission determines appropriate as a result of the occurrence of an event beyond the control of SA Water which has or will have a material impact on the cost of provision of a drinking water retail service or a sewerage retail service during the regulatory period. The adjustment mechanism must operate on the basis of efficient costs attributable to the event, and so as to promote a stable price path for retail services.
- 3.7 The determination must adopt or apply the NWI Principles for the Recovery of Capital Expenditure, subject to the following:

- 3.7.1 the determination must adopt or apply the value of \$7.77 billion as the regulated asset base (**RAB**) as at 1 July 2013 (in December 2012 dollars) in relation to assets used by SA Water in the provision of drinking water retail services;
  - 3.7.2 the determination must adopt or apply the value of \$3.58 billion as the RAB as at 1 July 2013 (in December 2012 dollars) in relation to assets used by SA Water in the provision of sewerage retail services;
  - 3.7.3 the determination must allow SA Water to recover the efficient cost of assets acquired (or to be acquired) after 1 July 2013 which are required to support activities that SA Water is required to provide in accordance with a direction under section 6 of the *Public Corporations Act 1993*;
  - 3.7.4 for the avoidance of doubt, the Commission must only adopt or apply Principle 6 of the NWI Principles for the Recovery of Capital Expenditure in relation to contributed assets that SA Water acquires after 1 July 2013.
- 3.8 The determination must adopt or apply Principle 1 of the NWI Principles for Urban Water Tariffs, subject to the following:
- 3.8.1 in relation to costs relating to externalities (including water planning and management), the determination must only allow SA Water to recover such costs as are attributable to and payable by SA Water in accordance with the law, including a direction under section 6 of the *Public Corporations Act 1993*;
  - 3.8.2 the determination must allow SA Water to recover such costs (less any relevant contributions to such costs that it receives) that are attributable to activities that SA Water is required to provide in accordance with a direction under section 6 of the *Public Corporations Act 1993*, and are either:
    - (i) specified in the relevant direction, or if not so specified,
    - (ii) determined by the Commission to be efficient.

#### 4. PREPARATION AND PRESENTATION

- 4.1 The determination must be prepared and presented consistently with "*the Regulated Asset Base (RAB), or building blocks approach*" as described in the NWI Principles for the Recovery of Capital Expenditure (subject to clause 3.7 above).
- 4.2 In particular, the determination must identify the assumptions on which it is based, including the method of calculation of, and monetary value assigned to, each of the following parameters for the purposes of the determination:
  - 4.2.1 the RAB, where the values set out in clauses 3.7.1 or 3.7.2 (as appropriate) are to be rolled forward consistently with Principle 5 of the NWI Principles for the Recovery of Capital Expenditure;
  - 4.2.2 the rate of return on the RAB (which should be consistent with Principle 1 of the NWI Principles for the Recovery of Capital Expenditure);

- 4.2.3 any allowance for working capital (i.e. any allowance considered appropriate to adjust for the lead or lag in cash flow as a result of incurring costs in providing services and receiving payment for those services);
  - 4.2.4 the rate of return of capital (depreciation), including its method of calculation, and any adopted classifications of, or remaining life attributable to, the regulatory assets on which it is based;
  - 4.2.5 operating expenditure (which should include efficient operational, maintenance and administrative costs);
  - 4.2.6 the costs of externalities, consistent with clause 3.8.1; and
  - 4.2.7 any allowance for tax paid (which should be identified separately from the rate of return on the RAB where the weighted average cost of capital (WACC) is calculated on a post-tax basis).
- 4.3 Where the Commission anticipates a likely material variation in either the method of calculation of, or monetary value assigned to, any of the parameters identified in clause 4.2 as between any draft of a determination to which this Order will apply in accordance with clause 2.4, and the relevant final determination, then the draft of the determination must identify, in relation to any such anticipated likely material variation:
- 4.3.1 the relevant parameter;
  - 4.3.2 the likely cause or causes;
  - 4.3.3 where the anticipated variation is to the monetary value assigned to a parameter, the likely magnitude and direction.
- 4.4 The Commission must prepare and provide to the Treasurer, on or before 31 December 2014, a separate report setting out the Commission's proposed approach to the calculation of the rate of return on the RAB (which should be consistent with Principle 1 of the NWI Principles for the Recovery of Capital Expenditure).

## 5. VARIATION

This Order may be varied by a subsequent pricing order issued under section 35 of the Act.



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Jay Weatherill  
**PREMIER**  
**A/TREASURER**

15/2014

# APPENDIX 2: NOVEMBER 2014 PRICING ORDER

**WATER INDUSTRY ACT 2012 (SECTION 35)**  
**PRICING ORDER**  
**FOR THE VARIATION OF A PREVIOUS PRICING ORDER**

Pursuant to section 35(4) of the *Water Industry Act 2012* (**the Act**), the Treasurer hereby issues the following pricing order (**this Order**):

**1. INTERPRETATION**

1.1 In this Order, *September Pricing Order* means the order issued by the Treasurer pursuant to section 35(4) of the Act dated 2 September 2014.

**2. APPLICATION**

2.1 This Order is to take effect from the date that it is signed.

2.2 This Order applies so as to vary the September Pricing Order.

2.3 Clause 4.4 of the September Pricing Order is varied to delete the words "31 December 2014" and substitute in their place "31 March 2015".

**3. VARIATION**

3.1 This Order may be varied by a subsequent pricing order issued under section 35 of the Act.

  
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**TOM KOUTSANTONIS M.P.**  
Treasurer

Date: 18<sup>th</sup> November 2014



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