4 ESTIMATING REVENUE REQUIREMENTS

It is common practice for monopoly, or near monopoly, providers of goods and services to be subject to government regulation with respect to setting prices, particularly where the goods and services provided are considered to be essential services such as electricity and water.

In the absence of effective competition, regulation of such industries aims to ensure that consumers do not pay more than the efficient cost of providing the goods or services, and to ensure that the goods and services meet prescribed standards. The framework most commonly used by Australian economic regulators to determine prices for regulated services is referred to as the 'building block' approach.

4.1 Building block approach

The Economic Regulator adopted the building block methodology for the first regulatory period and will continue this approach for the second regulatory period.

Under the building block approach the maximum revenue a regulated business is allowed for each period is determined by the following costs ('building blocks') incurred in providing regulated goods and services:

- depreciation;
- Opex necessary to provide the regulated services; and
- cost of capital - comprising the cost of the debt and equity that together make up the total amount of capital invested in the regulated business.

The value of capital invested in the regulated business is equal to the value of the regulated asset base (RAB) ie assets used to provide regulated services while the cost of capital is determined by multiplying the capital invested (RAB) by an appropriate weighted average cost of capital (WACC).

Therefore, under the building block approach, the maximum allowed revenue for each period is calculated as follows:

$$\text{Maximum allowed revenue} = (\text{RAB} \times \text{WACC}) + \text{D} + \text{OM}$$

where:

RAB = value of regulated asset base

WACC = weighted average cost of capital (return on capital)

D = depreciation (return of capital)

OM = operating and maintenance expenditure

4.2 Revenue limits

Consistent with the approach adopted in the first water and sewerage price determination investigation the Economic Regulator has calculated three annual revenue limits – upper, lower and statutory.

In calculating the regulated entity's revenue limits, the Economic Regulator has adopted an approach that is consistent with:

- the National Water Initiative (NWI) pricing principles[1];
- the pricing principles listed in section 68 of the Industry Act; and
- the additional pricing principles expressed in the Pricing Regulations.

4.2.1 National Water Initiative revenue limits

The NWI prescribes two revenue limits:

- the upper revenue limit (full cost recovery); and
- the lower revenue limit (sustainability threshold).

Under the NWI, a regulated water and sewerage business should recover revenue at least equal to the lower revenue limit but no greater than the upper revenue limit, as this represents the limit above which monopoly profits would be earned.

4.2.2 Statutory revenue limit

The requirements of the Industry Act necessitate an additional revenue limit - the statutory revenue limit.

The statutory revenue limit is the maximum allowed revenue where the cost of capital component is calculated in accordance with section 68(1A) of the Industry Act. Section 68(1A) of the Industry Act requires the rate of return, on assets transferred to the previous regulated entities before 1 July 2011, to incorporate a commercial rate of return on debt and a legislated pre-tax rate of return of three percent on equity. For all other assets, the rate of return will incorporate a commercial risk based rate of return on both debt and equity.

Therefore section 68(1A) of the Industry Act effectively requires two separate WACCs and two separate RABs: one for assets transferred to the previous regulated entities before 1 July 2011 and another for assets purchased or constructed by the previous regulated entities and, now TasWater after

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[1] Natural Resource Management Ministerial Council, 23 April 2010: http://www.environment.gov.au/water/policy-programs/urban-reform/nwi-pricing-principles.html

1 July 2009[2]. The assets are referred to as 'existing assets' and 'new assets' respectively.

TasWater must establish, maintain and roll forward each RAB on an annual basis in accordance with the Economic Regulator's Data Collection Template.

The RAB for existing assets will gradually decline over time as depreciation and disposals reduce the value of those assets, whilst the RAB for new assets will increase in line with Capex on new assets.

During the second regulatory period TasWater should be aiming to:

- ensure that revenue is kept above the lower revenue limit to maintain financial sustainability; and
- transition revenue towards the statutory revenue limit in the medium term (the maximum revenue permitted under the Industry Act).

Over the long term the statutory revenue limit will become the upper revenue limit as the value of existing assets decrease due to depreciation and disposals.

4.2.3 Statutory revenue limit formula

The annual statutory revenue limit ($R_{STATUTORY}$) is calculated as follows:

$$R_{STATUTORY} = (RAB_{EXISTING} \times WACC_{EXISTING}) + (RAB_{NEW} \times WACC_{NEW}) + D_{NEW} + D_{EXISTING} + OM$$

where:

$RAB_{EXISTING}$	=	value of the regulated asset base in respect of existing assets
$WACC_{EXISTING}$	=	weighted average cost of capital to be applied to existing assets
RAB_{NEW}	=	value of the regulated asset base in respect of new assets
$WACC_{NEW}$	=	weighted average cost of capital to be applied to new assets
D_{NEW}	=	Depreciation of the regulated asset base in respect of new assets
$D_{EXISTING}$	=	Depreciation of the regulated asset base in respect of existing assets
OM	=	operating and maintenance expenditure

[2] Amongst other things, the *Water and Sewerage Corporation Act 2012* provided for the transfer of the assets and liabilities of the previous regulated entities to the new regulated entity, TasWater.

4.2.4 Upper revenue limit formula

The annual upper revenue limit (R_{UPPER}) is calculated as follows:

$$R_{UPPER} = (RAB_{NEW} \times WACC_{NEW}) + (RAB_{EXISTING} \times WACC_{NEW}) + D_{EXISTING} + D_{NEW} + OM$$

where:

$RAB_{EXISTING}$ = value of the regulated asset base in respect of existing assets

RAB_{NEW} = value of the regulated asset base in respect of new assets

$WACC_{NEW}$ = weighted average cost of capital to be applied to new assets

D_{NEW} = Depreciation of the regulated asset base in respect of new assets

$D_{EXISTING}$ = Depreciation of the regulated asset base in respect of existing assets

OM = operating and maintenance expenditure

4.2.5 Lower revenue limit formula

The annual lower revenue limit (R_{LOWER}) is calculated as follows:

$$R_{LOWER} = Debt + OM + ARA$$

where:

Debt = debt servicing costs

OM = operating and maintenance expenditure

ARA = asset renewal annuity

The lower revenue limit provides an estimate of the cash outlays TasWater needs to fund to be considered to be operating at a financially sustainable level.

4.3 Revenue limit components

4.3.1 Regulated asset base

The RAB comprises the values of assets used to provide regulated services and therefore excludes the value of assets to provide unregulated services which are discussed in section 4.3.1.4.

As discussed in section 4.2.2 section 68(1A) of the Industry Act necessitates calculating two RABs ($RAB_{EXISTING}$ and RAB_{NEW}). Each RAB is split between water and sewerage assets to enable the Economic Regulator to ascertain whether the revenue from each regulated service relates only to the costs associated with providing that service. The Economic Regulator has not attempted to exclude third party capital contributions made before the previous regulated entities were formed from $RAB_{EXISTING}$ due to difficulties in ascertaining the value of those contributions.

The opening $RAB_{EXISTING}$ and RAB_{NEW} are DORC[3] asset values as at 1 July 2015 which have been rolled forward from 1 July 2009.

For each financial year of the second regulatory period RAB_{NEW} is rolled forward as follows:

Opening RAB_{NEW}

+ Capex

- $Depreciation_{NEW}$

- $Asset\ disposals_{NEW}$

- Third party capital contributions

= Closing RAB_{NEW}

For each financial year of the second regulatory period, $RAB_{EXISTING}$ is rolled forward as follows:

Opening $RAB_{EXISTING}$

- $Depreciation_{EXISTING}$

- $Asset\ disposals_{EXISTING}$

= Closing $RAB_{EXISTING}$

The RABs in each financial year are calculated as the average of the opening RAB (ie the RAB as at 1 July in the relevant financial year) and closing RAB (ie the RAB as at 30 June in the relevant financial year) with the opening RAB value in each financial year equal to the closing balance from the previous financial year.

4.3.1.1 Capital expenditure (Capex)

Capex is the amount invested in new regulated assets and includes expenditure funded through third party capital contributions but excludes expenditure on assets used to provide unregulated services.

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[3] Depreciated Optimised Replacement Cost.

4.3.1.2 Third party contributions

Third party capital contributions are assets contributed by third parties that are not funded by the regulated entity and include developer charges, service introduction charges, and government grants. Third party capital contributions are netted off the value of the RAB as regulated entities are not permitted to receive a return on capital, or return of capital, that they did not fund.

4.3.1.3 Asset disposals

Asset disposals include assets which are no longer used to provide regulated services.

4.3.1.4 Assets used to provide unregulated services

The cost of assets used to provide unregulated services (ie unregulated assets) must be recovered from the customers utilising those services rather than from the regulated customer base.

Unregulated services include:

- providing water for irrigation;
- reusing water, discharged from a sewage treatment plant, for irrigation; and
- providing stormwater services via a combined sewerage/stormwater system.

In determining the regulated entity's RAB, the value of unregulated assets and the costs associated with unregulated services, such as providing water for irrigation or providing stormwater services via a combined sewerage/stormwater system, must therefore be excluded using an optimisation approach. Under the optimisation approach, the value of assets used to provide services to both unregulated and regulated customers is adjusted to determine the value of the assets required to service regulated customers only, which is then included in the RAB.

Where reuse water is used for irrigation in accordance with existing contracts, a proportion of reuse assets must be excluded from the RAB to cover the cost of the reuse system based on the following ratio:

$$\frac{\text{Revenue received from reuse customers}}{(\text{Value of assets used to provide reuse water} \times \text{WACC}) + D + OM}$$

where:

WACC = Weighted average cost of capital[4]

D = Depreciation associated with reuse assets

[4] $WACC_{NEW}$ to be used where new assets are used for reuse activities and $WACC_{EXISTING}$ to be used where existing assets are used for reuse activities.

OM = Operating and maintenance expenditure associated with reuse assets

For new reuse schemes or renegotiated reuse contracts, the value of assets excluded from the RAB is calculated on the basis of a ratio proposed by the regulated entity which reflects the average revenue contribution from reuse customers as a proportion of total reuse costs. The ratio proposed by the regulated entity must be justifiable.

4.3.2 Depreciation

Depreciation is the return of the capital invested in an asset over the life of that asset. The regulated entity is required to calculate depreciation using the straight line method. Different useful lives of the assets comprising $RAB_{EXISTING}$ and RAB_{NEW} will result in two depreciation rates which are used to calculate separate depreciation amounts for each RAB roll forward for each financial year of the second regulatory period. In addition the two depreciation amounts are used in calculating the statutory revenue limit (section 4.2.3) and upper revenue limit (section 4.2.4).

Depreciation on existing assets ($D_{EXISTING}$) in each financial year of the second regulatory financial period is calculated as follows:

$$D_{EXISTING} = DR_{EXISTING} \times (\text{Opening } RAB_{EXISTING} - (0.5 \times AD_{EXISTING}))$$

Where:

$DR_{EXISTING}$ = depreciation rate for existing assets

$$= \frac{1}{\text{Average use life of existing assets}}$$

Opening $RAB_{EXISTING}$ = opening value of $RAB_{EXISTING}$ in each financial year

$AD_{EXISTING}$ = existing asset disposals

Depreciation on new assets (D_{NEW}) in each financial year of the second regulatory financial period is calculated as follows:

$$D_{NEW} = DR_{NEW} \times (\text{Opening } RAB_{NEW} + (0.5 \times (\text{Capex} - CC - AD_{NEW})))$$

Where:

DR_{NEW}	=	depreciation rate for new assets
	=	$\frac{1}{\text{Average use life of new assets}}$
Capex	=	capital expenditure
Opening RAB_{NEW}	=	opening value of RAB_{NEW} in each financial year
CC	=	third party capital contributions
AD_{NEW}	=	new asset disposals

4.3.3 Operating and maintenance expenditure (Opex)

The three revenue limits include an amount for the efficient costs of operating and maintaining the water and sewerage systems together with the associated administrative costs in respect of providing regulated services. Opex relating to providing unregulated services is excluded from the Opex amount used to calculated the three limits.

Opex consists of:

- Operating costs - costs incurred in operating the water and sewerage system, including the cost of collecting, treating, testing, and pumping water and sewerage and also include royalties, chemicals, power and labour.
- Maintenance costs - the direct costs of maintaining the water and sewerage systems and include materials, internal labour costs, and contractor costs. The total maintenance costs will vary with the type, age and general condition of the assets.
- Regulatory costs - including charges imposed by the various industry Regulators and internal costs incurred in complying with regulatory obligations.
- Administration costs - including all overhead costs, salaried staff costs (including costs of planning and engineering staff) and other items such as Board costs but excludes depreciation and interest costs except where interest paid relates to security deposits.

4.3.4 Weighted Average Cost of Capital (WACC)

The return on capital is calculated using the WACC which is the weighted average of the cost of debt and cost of equity. In line with accepted regulatory practice, a benchmarked debt to equity ratio is used in calculating the WACC to ensure customers do not bear the cost associated with an inefficient financing structure.

The WACC can be set on a real or nominal, pre-tax or post-tax basis. There is little consistency across Australia in terms of the type of WACC adopted for the water and sewerage sector. Therefore the Economic Regulator proposes to use a real pre-tax WACC as was used in the first water and sewerage price investigation.

As discussed in section 4.2.2, section 68(1A) of the Industry Act requires the calculation of two separate WACCs: $WACC_{NEW}$ and $WACC_{EXISTING}$.

4.3.4.1 WACC NEW

$WACC_{NEW}$ incorporates a commercial risk adjusted cost of debt and return on equity and is used in calculating the statutory revenue limit (section 4.2.3) and the upper (section 4.2.4) revenue limits. The WACC is converted from a nominal to a real measure. Throughout this draft report the real WACC (shown below as "$_{REAL}WACC_{NEW}$") is referred to as $WACC_{NEW}$.

$WACC_{NEW}$ is calculated as follows:

$$_{nominal}\,WACC_{new} = Rd \times G + Re \times \left(\frac{1}{(1 - t(1 - \gamma))}\right) \times (1 - G)$$

$$_{real}\,WACC_{new} = \left(\frac{(1 + WACC_{new\ nominal})}{(1 + i)}\right) - 1$$

where:

Re	=	Cost of equity (post-tax)
	=	$Rf + \beta_e \times (MRP)$
Rd	=	pre–tax cost of debt
MRP	=	market risk premium
Rf	=	risk free rate
t	=	corporate tax rate
β_e	=	equity beta
G	=	gearing ratio

i	=	forecast inflation (annual average over regulatory period)
γ	=	gamma - represents the proportion of imputation credits, which can be utilised by shareholders and varies between 0 and 1

Applying the formula, the Economic Regulator approved 5.32 per cent as the value of $WACC_{NEW}$ for the first regulatory period.

4.3.4.2 $WACC_{EXISTING}$

The statutory revenue limit (section 4.2.3) requires a WACC ($WACC_{EXISTING}$), to be applied to existing assets incorporating real pre-tax cost of equity of three per cent per annum. Therefore, $WACC_{EXISTING}$ is calculated by replacing the formula for $WACC_{NEW\ NOMINAL}$ in section 4.3.4.1 with the following:

$$WACC_{EXISTING\ NOMINAL} = (Rd \times G) + (Z \times (1 - G))$$

where:

Z	=	Statutory pre-tax return on equity replacing $\text{Re} \times \left(\frac{1}{(1 - t(1 - \gamma))} \right)$ in the $WACC_{NEW}$ formula.
Rd	=	pre-tax cost of debt
G	=	gearing ratio

Applying the formula, the Economic Regulator approved 2.74 per cent as the value of $WACC_{EXISTING}$ for the first regulatory period.

4.3.5 Asset renewal annuity

The Asset Renewal Annuity (ARA) is the annualised average cost of maintaining the operating capacity of existing infrastructure assets. The ARA provides an estimate of the amount of funds required to meet future Capex needs converted to an annuity so that the relevant funds can be accumulated consistently and equitably over a long period thereby avoiding sudden significant variations in funding needs.[5]

As investment in infrastructure assets is generally “lumpy” rather than being able to be added in regular small increments, an annuity is used to smooth out the year to year variations in asset refurbishment and replacement expenditure.

The ARA is part of the calculation of the lower revenue limit and is calculated using the following formula:

$$ARA = NPV \times \left(\frac{r}{(1 - (1 + r)^{-n})} \right)$$

[5] The ARA is based on estimating the funds required to replace the assets as distinct from depreciation which apportions the cost of the assets over their useful lives.

where:

NPV = the net present value of projected asset renewal and replacement expenditure

r = the discount rate

n = the number of years

As for the first regulatory period, the Economic Regulator directed the regulated entity, via the PSP Guideline, to include Capex required to achieve regulatory compliance in its ARA on the basis that achieving regulatory compliance (ie operating legally) is considered necessary to achieving a sustainable operation.

The discount rate used in calculating the NPV for the ARA is $WACC_{NEW}$.

4.3.6 Debt Servicing Costs

The lower revenue limit includes the regulated entity's actual debt servicing costs rather than the benchmark level of debt used calculating the WACC as the lower revenue limit is the minimum revenue required to be financially sustainable. Debt servicing costs applicable in calculating the lower limit are total debt servicing costs for each financial year of the second regulatory period apportioned on the ratio of the value of regulated assets to the value of total assets.

4.4 Economic Regulator's assessment of TasWater's proposed revenue limit components

This section assesses TasWater's revenue limit components as provided in its Data Collection Template and proposed price and service plan and explains the Economic Regulator's proposed approach to, and results from, calculating each of the components having regard to:

- the information contained in Jacobs' final report;
- the information in TasWater's Data Collection Template; and
- TasWater's responses to the Economic Regulator's queries about the data provided in the data collection template.

As outlined in section 2.3, the Economic Regulator commissioned Jacobs to undertake an independent review[6] of TasWater's proposed Opex and proposed Capex (including asset values). In particular, Jacobs was required to examine whether it considered:

- there was a need for TasWater to spend the amounts proposed (ie was the expenditure prudent); and

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[6] Jacobs's *Review of the Tasmanian Water and Sewerage Corporation's Operating Expenditure and Capital Expenditure (including asset values) Final Report, 2 December 2014*

- whether the amount spent was the most cost effective approach to achieving the desired outcomes (ie was the expenditure efficient).

4.4.1 Capex

Table 4.1 shows the Capex values from TasWater's Data Collection Template and the Capex values from Table 9 of TasWater's proposed price and service plan. The differences between the two sets of figures are due to the inclusion of third party contributions in the Data Collection Template figures.

Table 4.1 TasWater's proposed Capex ($'000s)

	2015-16	2016-17	2017-18
Price and service plan	110 000	110 000	110 000
Data Collection Template	117 745	117 939	118 138

Jacob's review identified that TasWater has, and the three previous regulated entities also had, under-spent on capital projects compared to their respective Capex forecasts. Jacobs also questioned the efficiency of TasWater's proposed Capex based on its review of a sample of TasWater's capital projects. Jacobs also discounted the Capex in TasWater's proposed price and service plan by 2.5 per cent to express the figures in real 2015 dollars as shown in the following table:

Table 4.2 Jacobs' discounting of TasWater's proposed Capex ($'000s)

	2015-16	2016-17	2017-18
TasWater proposed (nominal)	110 000	110 000	110 000
Jacobs (real2015$)	107 250	104 570	101 960

Based on the findings of its review, Jacobs recommended reducing TasWater's proposed Capex in 2015-16 by $10.73 million and increasing TasWater's proposed Capex in 2017-18 by $10.73 million.

Jacobs explained that the recommended decrease in 2015-16 reflected TasWater's current low level of committed expenditure, the approval delays associated with some of the projects Jacobs had sampled and TasWater's history of under delivering capital projects.

Jacobs also explained that the recommended increase in 2017-18 recognised that TasWater had demonstrated to Jacobs' satisfaction that there was a genuine need for the proposed Capex to occur (ie the expenditure was prudent) and was an acknowledgment of TasWater's focus on both increasing its capacity to deliver capital projects and in developing business cases in relation to high priority projects.

The Economic Regulator has accepted Jacob's recommendations with respect to TasWater's Capex allowance for the second regulatory period, net of unregulated

Capex[7]. The Capex values the Economic Regulator used in determining TasWater's two RABs are specified in the following table.

Table 4.3 Economic Regulator's proposed Capex allowances ($'000s)

	2015-16	2016-17	2017-18
Jacobs' Capex recommendation	96 530	104 570	112 690
Less: unregulated Capex	921	970	0
Economic Regulator's Proposed Capex	95 609	103 600	112 690
Breakdown of Economic Regulator's proposed Capex allowances:			
Water	42 336	45 986	47 533
Sewerage	53 273	57 614	65 157

4.4.2 Third party contributions

Table 4.4 shows TasWater's proposed third party contributions, namely gifted reticulation assets. The Economic Regulator notes that TasWater's forecast total revenue (Table 28 of TasWater's proposed price and service plan) includes government grants which are not included in third party contributions in its Data Collection Template for the purpose of determining the RABs.

Table 4.4 TasWater's proposed third party contributions ($'000s)

	2015-16	2016-17	2017-18
Third party contributions	7 745	7 939	8 138

The Economic Regulator has included therefore values shown in Table 4.5 in determining the two RABs.

Table 4.5 Economic Regulator's proposed third party contributions ($'000s)

	2015-16	2016-17	2017-18
Reticulation assets	7 745	7 939	8 138
Government grants	6 499	1 874	1 874
Total Third Party Contributions	14 244	9 813	10 012

4.4.3 Depreciation

Table 4.6 shows TasWater's average useful life for new and existing assets as provided in its Data Collection Template. Jacobs' review notes that, due to a lack of detail about the assumptions TasWater has adopted in calculating the useful lives

[7] As provided in TasWater's Data Collection Template.

for its assets, it was unable to validate the asset lives provided in Table 19 of TasWater's proposed price and service plan. Jacobs also questioned the adoption of a relatively short 40 year asset life for new asset headworks.

Table 4.6 TasWater's average useful life – existing and new assets (years)

	Average useful life – existing assets	Average useful life – new assets
Water	36.9	40.1
Sewerage	35.6	36.3

The Economic Regulator has reviewed the data provided by TasWater and recalculated the useful lives of TasWater's infrastructure assets based on TasWater's data and using a weighted average rather than a straight average. The resultant useful lives are shown in Table 4.7 whilst the recalculated combined depreciation figures for new assets and existing assets are reflected in Tables 4.8 and 4.9 for each year of the second regulatory period.

Table 4.7 Economic Regulator's proposed average useful lives and depreciation rates for existing and new assets

	Average useful – existing assets (years)	Depreciation rate (%)	Average useful life – new assets (years)	Depreciation rate (%)
Water	42.3	2.36	57.5	1.74
Sewerage	39.4	2.54	56.7	1.76

Table 4.8 Economic Regulator's proposed calculation of depreciation for new assets (D_{NEW}) ($'000s)

	2015-16	2016-17	2017-18
TasWater	14 711	18 197	21 641
Economic Regulator	8 039	9 614	11 335
Variation	(6 672)	(8 583)	(10 306)

Table 4.9 Economic Regulator's proposed calculation of depreciation for existing assets ($D_{EXISTING}$) ($'000s)

	2015-16	2016-17	2017-18
TasWater	75 030	75 030	75 030
Economic Regulator	63 398	63 398	63 398
Variation	(11 632)	(11 632)	(11 632)

4.4.4 WACC – new and existing assets

With respect to the WACC, TasWater proposes using the current 2012-15 parameters for market return, equity beta, gearing, corporate tax rate and gamma (being 6 per cent, 0.65, 60 per cent, 30 per cent and 50 per cent respectively) and

adopting the following methodology for calculating the risk free rate and debt risk premium:

- Calculate the risk free rate as close as possible to the start of the regulatory reset period using the simple averages of Reserve Bank of Australia (RBA) data for the 10 year Commonwealth Government bond rate over the previous 40 business days and over the previous 10 years.
- Calculate the debt risk premium as close as possible to the start of the regulatory reset period using the simple averages of the BBB credit (debt) margin over the previous 40 business days and over the last 10 years, using RBA data.

Applying this approach, TasWater calculated the $WACC_{NEW}$ and $WACC_{EXISTING}$ as shown in Tables 4.10 and 4.11 respectively.

Table 4.10 TasWater's Parameters for $WACC_{NEW}$

Parameter	Description	Proposed value
Re	cost of equity (post tax)	8.26%
Rd	pre-tax cost of debt	6.87%
MRP	market risk premium	6.00%
Rf	risk free rate	4.36%
T	corporate tax rate	30.00%
β_e	equity (beta)	0.65
G	gearing ratio	60.00%
i	forecast inflation	2.50%
γ	gamma	50.00%
$WACC_{NEW}$		5.37%

Table 4.11 TasWater's Parameters for $WACC_{EXISTING}$

Component	Description	Proposed value
Rd	pre-tax cost of debt	6.87%
G	gearing ratio	60.00%
Z	statutory pre-tax return on equity	3.00%
i	forecast inflation	2.50%
$WACC_{EXISTING}$		2.75%

The Economic Regulator proposes maintaining, market return, equity beta, gearing, corporate tax rate and gamma as per the first regulatory period (ie 6 per cent, 0.65, 60 per cent, 30 per cent and 50 per cent respectively). With respect to the risk free rate and the debt risk premium, Australian economic regulators use a number of diverse approaches to determine these parameters. Furthermore, economic regulators may use a different approach for different industries due to specific legislative requirements.

The change in approach to determining the debt component of the cost of capital reflects that in recent years regulated entities have been lobbying regulators that the debt incurred by the benchmark firm should reflect an efficient debt financing and risk management policy. Such a policy would be based on issuing debt at different points in time with a staggered maturity profile. Therefore the effective interest cost of an unregulated business is likely to be a mix of current and past interest rates. Consequently a point in time estimate does reflect actual debt issuing practises

While the Economic Regulator acknowledges the arguments in favour of incorporating a historic component in the debt component, the Economic Regulator also notes the Economic Regulation Authority's (ERA) view that incorporating past interest rates into the cost of debt is akin to a cost pass through. This leaves customers exposed to interest rate risk and has the potential to result in costs of debt out of line with the market and distorting capex incentives.

The approaches currently to determining the debt component that are being applied or considered include:

- a 'trailing average' methodology;
- a trailing average methodology with a transitional period;
- the mid-point of the 40 trading day average and a 10 year average of the yield on 10 year Commonwealth Government securities (CGS); and
- 40 trading day average of the yield on 10 year CGS.

In the absence of any consensus among economic regulators, the Economic Regulator proposes to calculate the risk free rate as the mid-point of the 40-day trading average of the 10 year CGS and a time weighted average of the 10-year CGS with a 10 year averaging period.

With respect to the debt risk premium, the Economic Regulator proposes using the credit spreads for Australian non-financial corporation's (NFCs) as published by the RBA. As the RBA's corporate credit spread is available monthly the Economic Regulator intends taking the last two observations available prior to making its final Price Determination. The WACCs in Tables 4.12 and 4.13 use the RBA data for 12 December 2014.

Table 4.12 Economic Regulator's parameters for $WACC_{NEW}$

Parameter	Description	Proposed value
Re	cost of equity (post tax)	7.63%
Rd	pre-tax cost of debt	6.01%
MRP	market risk premium	6.00%
Rf	risk free rate	4.36%
T	corporate tax rate	30.00%
β_e	equity (beta)	0.65
G	gearing ratio	60.00%
i	forecast inflation	2.50%
γ	gamma	50.00%
$WACC_{NEW}$		4.58%

Table 4.13 Economic Regulator's parameters for $WACC_{EXISTING}$

Component	Description	Proposed value
Rd	pre-tax cost of debt	6.01%
G	gearing ratio	60.00%
Z	statutory pre-tax return on equity	3.00%
i	forecast inflation	2.50%
$WACC_{EXISTING}$		2.25%

The methodology and the parameters adopted by the Economic Regulator in calculating the $WACC_{NEW}$ and $WACC_{EXISTING}$ is based on data available to the Economic Regulator at the time of preparing this Draft Report.

The Economic Regulator will review the methodology and the parameters to be adopted in the Final Report when making its Final Determination in April 2015.

4.4.5 Opening regulatory asset base (New Assets)

TasWater calculated its opening RAB for new assets as follows:

Table 4.14 TasWater's Opening RAB new assets ($'000s)

	Water	Sewerage
1 July 2015 Opening RAB	272 028	196 249

As discussed in section 4.4.1 Jacobs' review identified that TasWater's actual Capex was less than its forecast Capex with Jacob's establishing that TasWater and its predecessors had underspent approximately $64 million over the first regulatory period. Consequently, the Economic Regulator has recalculated TasWater's opening RAB (New Assets) as at 1 July 2015 to factor in the difference between

actual and forecast Capex during the first regulatory period. The adjustment applied to TasWater's opening RAB (New Assets) has been calculated as follows:

(a) Determine the difference between the closing RAB value for 2014-15 for new assets in the first regulatory period and the closing RAB value for new assets for 2014-15 as provided by TasWater in its Data Collection Template. This provides the amount of under-spent Capex already factored into the opening RAB (New Assets).

(b) Subtract the difference between the RABs calculated in (a) from the amount of under-spent Capex identified by Jacobs. This is the additional amount of under-spent Capex that is not factored into the opening RAB (New Assets).

(c) Reduce the opening RAB (New Assets) by the amount calculated in (b).

The adjusted Opening RAB for new assets is provided in the following table.

Table 4.15 Economic Regulator's Opening RAB new assets ($'000s)

	Water	Sewerage
1 July 2015 Opening RAB	251 018	174 789

4.4.6 Regulatory assets bases

Based on the Economic Regulator's proposed RAB components specified in sections 4.4.1 to 4.4.5 above, the Economic Regulator has calculated TasWater's two RABs as follows:

Table 4.16 Economic Regulator's RABs ($'000s)

	2015-16	2016-17	2017-18
RAB_{NEW}	2 558 217	2 494 819	2 431 421
$RAB_{EXISTING}$	462 470	541 220	628 978

4.4.7 Operating and maintenance expenditure

TasWater's proposed Opex is provided in the following table.

Table 4.17 TasWater's Opex ($'000s)

	2015-16	2016-17	2017-18
Debt Servicing Costs	160 301	164 676	169 173

Jacobs' review recommends using the Opex for the second year (ie 2013-14) of the current determination expressed in 2014-15 dollars as a base year from which Opex is determined for the second regulatory period. In addition Jacobs also recommends that the base Opex allowance be adjusted to remove annual recurring savings of $5.9 million arising from the merger of the three previous regulated entities into TasWater. Recognising the impacts of TasWater's proposed capital program on future Opex, Jacobs also recommends increases in TasWater's Opex allowances of $700 000 in 2015-16, $1 million in 2016-17 and $1.4 million in 2017-18.

The Economic Regulator also reviewed the actual Opex for the previous regulated entities' for 2012-13 and 2013-14 and notes that the aggregated actual Opex exceeded the previous regulated entities' aggregated Opex forecasts by $11.12 million and $9.24 million respectively. Further, TasWater's forecast Opex for 2014-15 exceeds the aggregate of the previous regulated entities' Opex forecasts by $9.99 million.

In conclusion, the Economic Regulator has accepted Jacobs' recommendations with respect to Opex and, after allowing for Opex associated with unregulated assets, has calculated TasWater's Opex for the second regulatory period as shown in Table 4.18.

Table 4.18 Economic Regulator's Opex ($'000s)

	2015-16	2016-17	2017-18
Opex	145 965	146 265	146 665

4.4.8 Value of unregulated assets

The Economic Regulator notes that TasWater's Data Collection Template proposed treating eight per cent of the value of its total assets as unregulated assets. The Economic Regulator questioned TasWater about this and was advised that TasWater had adopted the same percentage of unregulated assets to total assets as the previous regulated entities had relied upon.

However this percentage (and the corresponding unregulated asset values) appears to be relatively high given the Economic Regulator's understanding of TasWater's unregulated activities and the assets involved in those activities (eg the value of the stormwater component of the Launceston Combined System and the value of pumps and pipes used for sewage re-use activities). However, over-estimating unregulated assets would be to the benefit of water and sewerage customers. The Economic Regulator therefore proposes accepting TasWater's estimate of the value of its unregulated assets.

4.4.9 Debt servicing costs

The following table reflects TasWater's calculation of its debt servicing costs for each financial year of the second regulatory period.

Table 4.19 TasWater's debt servicing costs ($'000s)

	2015-16	2016-17	2017-18
Debt Servicing Costs	23 617	25 908	30 564

Upon review, the Economic Regulator noted that TasWater failed to apportion debt servicing costs on the basis of the ratio of the value of regulated assets to the value of total assets. Therefore, accepting TasWater's proposal that unregulated assets comprise eight per cent of its total assets leads to the following outcomes for debt servicing costs for each financial year of the second regulatory period:

Table 4.20 Economic Regulator's debt servicing costs ($'000s)

	2015-16	2016-17	2017-18
Debt Servicing Costs	21 728	23 836	28 119

4.4.10 Asset renewal annuity

The following table summarises TasWater's calculation of its ARA for both water and sewerage.

Table 4.21 TasWater's ARA ($'000s)

	2015-16	2016-17	2017-18
Water	45 511	45 511	45 511
Sewerage	49 679	49 679	49 679
Total ARA	95 190	95 190	95 190

The Economic Regulator sought further clarification from TasWater about its approach to the calculation of its ARA. In response, TasWater advised that it viewed the ARA as an annualised theoretical calculation of the future asset renewal and replacement program required to maintain the operating capacity of infrastructure assets over the life of the regulated entity. TasWater also considered that the ARA does not necessarily equate to the current and forecast spending allocated to renewals.

TasWater also explained that its annuity was based on a "fully regulated asset base" and essentially represented the amount it should be spending on renewals, as opposed to its forecast spend which, given its need to focus on compliance in the near future, is based on the remaining funds that can be allocated and delivered each year.

TasWater's responses indicate that it views the calculation of the asset renewal annuities approach as a theoretical exercise. The Economic Regulator does not accept TasWater's view or methodology in this regard.

In particular, the Economic Regulator notes that the inputs into TasWater's ARA were based on theoretical expenditure which the Economic Regulator contends is not practically achievable based on both Jacobs' and the Economic Regulator's review of TasWater's past Capex.

As a result the Economic Regulator has 're-profiled' each of the water and sewerage ARAs for the second regulatory period as follows:

(a) Use forecast renewal and compliance Capex as per the Data Collection Template for the three years of the second regulatory period.

(b) After three years, reduce compliance expenditure over a seven year period to reflect Jacobs' final report reference to compliance Capex being required for a decade.

(c) After three years, use the forecast renewal Capex for the five financial years from 2013-14 to 2017-2018 as provided in the Data Collection Template and then eight years of adding the annual reduction in compliance Capex to the renewals Capex over the previous eight years.

(d) From 2032 onwards use the combined renewal and compliance Capex from 2016 onwards thereby creating an approximate 17 year renewals cycle based on TasWater's own data which Economic Regulator considers is within TasWater's financial and logistical capabilities.

Applying the methodology outlined in (a) to (d) above, the Economic Regulator's ARA is as follows:

Table 4.22 Economic Regulator's calculation of the ARA ($'000s)

	2015-16	2016-17	2017-18
Water	16 040	16 040	16 040
Sewerage	28 991	28 991	28 991
TOTAL	45 031	45 031	45 031

As to the reasons for the large variation between TasWater's proposed ARA and the Economic Regulator's proposed ARA, the Economic Regulator is of the opinion that the annual annuity payments detailed in TasWater's ARA are not achievable and considers that TasWater has not provided adequate justification for its approach to calculating the ARA.

4.5 Calculation of TasWater's revenue limits

The upper, statutory and lower revenue limits in this section have been calculated using the revenue limit components proposed by the Economic Regulator in section 4.4.

Table 4.23 Upper revenue limit

	2015-16	2016-17	2017-18
Total RAB (a) ($'000s)	3 020 687	3 036 039	3 060 398
$WACC_{NEW}$ (b)	4.58%	4.58%	4.58%
Depreciation (c) ($'000s)	71 437	73 012	74 733
O&M (d) ($'000s)	145 965	146 265	146 665
Upper revenue limit = (a x b) + c + d ($000s)	355 666	358 243	361 479

Table 4.24 Statutory revenue limit calculation

	2015-16	2016-17	2017-18
$RAB_{Existing}$ (g) ($'000s)	2 558 217	2 494 819	2 431 421
$WACC_{EXISTING}$ (h)	2.25%	2.25%	2.25%
RAB_{New} (i) ($'000s)	462 470	541 220	628 978
$WACC_{NEW}$ (b)	4.58%	4.58%	4.58%
Depreciation (c) ($'000s)	71 437	73 012	74 733
O&M (d) ($'000s)	145 965	146 265	146 665
Statutory Revenue Limit = (g x h) + (i x b) + c + d ($000s)	296 054	300 108	304 822

Table 4.25 Lower revenue limit calculation

	2015-16	2016-17	2017-18
Debt servicing costs (e) ($'000s)	21 728	23 836	28 119
O&M (d) ($'000s)	145 965	146 265	146 665
ARA (f) ($'000s)	45 031	45 031	45 031
Statutory revenue limit = e + d + f ($000s)	212 724	215 132	219 814

In the following chapter, the revenue limits calculated above are compared against TasWater's forecast of its expected revenue for each year of the second regulatory period.

The Economic Regulator intends to require TasWater to adopt in its price and service plan the revenue limit calculations presented in this chapter.