Queensland Urban Utilities

Price Monitoring Information Return
31 August 2010

QUEENSLAND URBAN UTILITIES – TAKING CARE OF
YOUR WATER AND WASTEWATER NEEDS

QUEENSLAND UrbanUtilities

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1. PURPOSE AND INTRODUCTION

The Queensland Government has referred the newly established South East Queensland Distributor-Retailer water businesses for price monitoring by the Queensland Competition Authority (QCA). To facilitate the price monitoring, the QCA requires each Distributor-Retailer to complete a comprehensive *Information Requirements Template (QCA Data Template)*.

The Central SEQ Distributor-Retailer Authority trading as Queensland Urban Utilities is submitting this document to provide background, context and other supporting information to accompany the *QCA Data Template*.

This document includes:

- background information on Queensland Urban Utilities
- specific elements of information requirements including supporting details for the *QCA Data Template* worksheets
- the price setting approach for 2010/11 prices
- the Board certification for the submission of the *QCA Data Template*.

Queensland Urban Utilities considers that the information supplied in this document forms part of the submission to the QCA and should be read in conjunction with the *QCA Data Template*.

Queensland Urban Utilities began operation on 1 July 2010. The participation agreement between the shareholding councils of Queensland Urban Utilities was signed by the responsible minister on 25 June 2010 and the Board was appointed on 25 June 2010. Price setting for the 2010/11 year and the forecasts for 2011/12 and 2012/13 have been developed based on the best information available and our understanding of the regulatory and legislative environment at the time.

As foreshadowed by the Queensland Government in the referral of the new distributor-retailer water businesses for price monitoring by the QCA, the capacity of the new entities to provide comprehensive regulatory information will be limited, particularly in the 2010/11 year.

The previous shareholding council owners – Brisbane City Council, Ipswich City Council, Lockyer Valley Regional Council, Scenic Rim Regional Council and Somerset Regional Council, have provided much of the information presented in the *QCA Data Template*. Queensland Urban Utilities has compiled the data to form a single entity view of historical data and to form a base for forecasting information required for the *QCA Data Template*. Queensland Urban Utilities has made every effort to complete the *QCA Data Template* as required.

We also note that, in the price monitoring period, the Queensland Government's strong preference is for a light-handed approach to regulation. This is to enable the entities that have not previously been subject to economic regulation to develop the necessary capacity, systems and processes.

Our submission to the QCA should be read in the context of the matters outlined above.

2. BACKGROUND

2.1 ABOUT QUEENSLAND URBAN UTILITIES

Queensland Urban Utilities is an integrated water and wastewater distribution and retail statutory authority serving cities and towns across the Brisbane, Ipswich, Lockyer Valley, Scenic Rim and Somerset council areas.

The creation of Queensland Urban Utilities is the result of the Queensland Government's structural reforms of the water sector in South East Queensland, which have affected all elements of the regional water supply chain. Queensland Urban Utilities has merged the water and wastewater businesses of its five shareholding councils, making it one of the largest water and wastewater entities in Australia.

Within its operational area Queensland Urban Utilities is responsible for water delivery, wastewater transport and treatment, recycled water treatment and supply, operations and maintenance, new infrastructure, and retail services including billing and customer service.

Figure 1 Queensland Urban Utilities' operational area

From its full establishment on 1 July 2010, Queensland Urban Utilities will:

- serve a population of 1.3 million
- support in excess of 510,000 connections
- supply approximately 105,000 ML of drinking water each year
- employ over 1100 staff.

2.2 GOVERNANCE

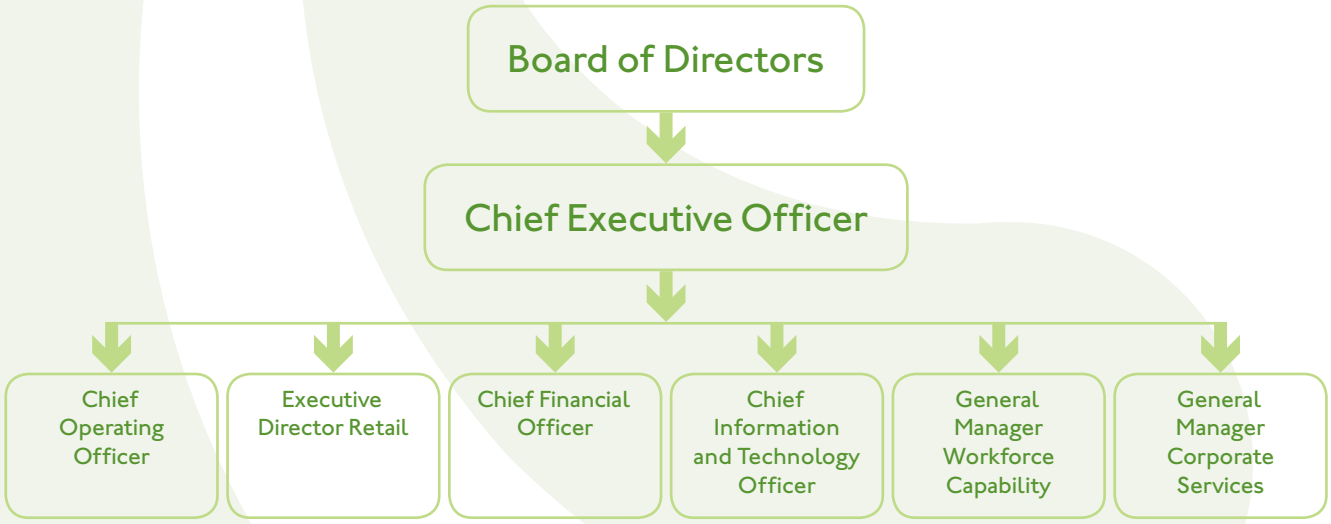
Queensland Urban Utilities will operate under the direction and control of an eight-member Board (the Board).

The Board will be responsible for:

- deciding the strategies and the operational, administrative and financial policies to be followed by Queensland Urban Utilities
- ensuring Queensland Urban Utilities performs its functions and exercises its powers in a proper, effective and efficient way
- ensuring, so far as practicable, Queensland Urban Utilities complies with its planning and reporting requirements.

2.2.1 ORGANISATIONAL STRUCTURE

Figure 2 Organisational structure



2.3 KEY STRATEGIC AND CORPORATE PRIORITIES

As a new business, Queensland Urban Utilities is developing its corporate structure, systems and culture. During the transition period, we have established the following strategic priorities and themes to help drive and support decision making.

- Delivery of reliable and quality water and wastewater services.
- A seamless transition for our customers.
- A safe working environment.
- Capable and committed people.
- Sustainable environmental performance.
- Delivery of the agreed program of work.

2.4 BUSINESS DETAILS

Table 1 Business details

Entity name	Central SEQ Distributor-Retailer Authority
Trading name	Queensland Urban Utilities
Australian Business Number	86 673 835 011
Principal place of business	Level 1 TC Beirne Building 315 Brunswick Street Mall Fortitude Valley QLD 4006
Contact person	Louise M Dudley Chief Financial Officer
Contact details	(07) 3027 5798

3. PRICING CONSIDERATIONS

3.1 PRICE SETTING

Price setting for 2010/11 was undertaken using the best information available to Queensland Urban Utilities at the time. The full operations of Queensland Urban Utilities commenced on 1 July 2010.

A majority of the information used in the price setting process was initially provided by councils and reviewed and refined by Queensland Urban Utilities. This included information on operating costs and capital expenditure.

Key decisions were required to be made by Queensland Urban Utilities such as the return on asset cost component. A weighted cost of capital (WACC) of 9.2% was used in the return on asset calculation. In considering the WACC, Queensland Urban Utilities considered not only the economic rate of return that might be used but also the impact of price increases on customers. The rate was selected having regard to this being the first time Queensland Urban Utilities set prices and to ensure a conservative approach to price setting for 2010/11, particularly in view of the number of uncertainties related to the application of the regulatory framework. As discussed in section 5.10 independent advice on the WACC was received which indicated that a higher rate was reasonable. Queensland Urban Utilities then sought further independent advice. This advice confirmed a higher WACC would be appropriate.

The 9.2% rate has been applied for consistency within the *QCA Data Template* for 2010/11 as this reflects the budget decision. The WACC as outlined in section 5.10 is 10.25% and has been used in the *QCA Data Template* for the other two forecast years.

3.2 TARIFFS

The initial set of tariffs Queensland Urban Utilities inherited includes all of the tariff structures applied by the shareholding councils in the 2009/10 financial year. This includes a variety of sub-district tariffs from before the merger of councils in March 2008.

In setting prices, shareholding councils considered a range of issues in structuring the previous tariffs. Regard was given to these principles in setting the 2010/11 prices. These principles are set out in Table 2 below.

Table 2 Tariff principles

Principle	Consideration
Efficient prices	• Whether the customer contributed infrastructure specific to their service supply.
	• The service level provided e.g. trickle feed versus pressurised services.
Revenue adequacy	• Revenue to be earned through rates versus revenue from water services.
	• Application of two-part tariffs.
Equity and social welfare	• Consider users' capacity to pay e.g. charitable and sporting clubs receiving reduced charges and non-residential customers paying higher prices.
	• High water users for health reasons e.g. discount to home dialysis users.
Environment and resource impact	• Water demand management through volumetric and tiered pricing.
Administrative practicality	• Set prices to be administratively feasible, and not impose undue information, management or systems costs.
Easily understood	• Endeavour to apply simpler rather than complex price structures in order to maximise awareness by consumers.

Price setting considerations normally take into account a longer term view than one year. However the QCA is awaiting direction from the Queensland Treasury and Queensland Water Commission to commence consulting on and developing the long-term pricing principles for the South East Queensland water industry. These principles are necessary to allow a meaningful assessment of longer term pricing, including tariff structuring. Our focus to date has been of necessity to determine the required price increases for 2010/11 financial year based on the best available information.

Structural changes to tariffs impact customer groups to varying levels and Queensland Urban Utilities intends to consult with customers and the community as part of the detailed assessment of tariff alignment. We believe that it is critically important that this consultation time is allowed in the process.

Accordingly, no structural alignment has been undertaken of tariffs that apply in the 2010/11 financial year. Queensland Urban Utilities proposes to review tariff structures during the interim regulatory period with the goal of establishing a simpler set of tariffs to apply in future years. This review will be conducted in consultation with customers and the community and requires the urgent provision of the long-term pricing principles.

A summary list of current tariffs is provided in Annex 1.

3.2.1 DISCOUNTS

The shareholding councils of Lockyer Valley, Scenic Rim and Somerset previously provided prompt-payment discounts of 10%, 5% and 15% respectively on water and wastewater fixed charges. Queensland Urban Utilities does not offer such discounts.

In recognition of the discounts previously offered, these discounts were applied to the actual 2009/10 tariffs prior to the application of the required price increase for 2010/11.

4. POLICIES, PROCEDURES AND SYSTEMS

4.1 ACCOUNTING SYSTEM

Queensland Urban Utilities has been able to form its primary accounting system within the mature financial systems operated by Brisbane City Council (BCC). Under a service level agreement, BCC provides Queensland Urban Utilities with systems for payroll, procurement, job costing, asset management, sundry debtors, general ledger and cash management. (Queensland Urban Utilities' primary utility billing system is owned by Queensland Urban Utilities and is completely separate from BCC's rating system.)

The BCC systems are provided in a manner that allows Queensland Urban Utilities to manage its own data and most of the systems operations. Queensland Urban Utilities' data is also separate from BCC data, allowing each entity to operate their own books independently.

This has provided Queensland Urban Utilities with a fully operational financial platform to provide accounting information from 1 July 2010. However, only limited legacy information is maintained within this system.

The general ledger chart of accounts is similar to that previously used for the BCC water business. Modifications to the chart of accounts are limited due to the use of the same chart within the BCC general ledger. The general ledger captures costs across three dimensions – natural account, cost centres and products (or services).

The natural account dimension is based on the nature of the transactions i.e. labour costs, services, depreciation and so on. Sub-accounts provide further sub-categorisation.

Cost centres (responsibility centres) provide for the departmental categorisation of transactions. These categorisations generally follow the organisational structure and the cost centres can be rolled up to provide reporting at various levels within the organisational structure. (The expansion of the original BCC water business for Queensland Urban Utilities primarily involved the addition of cost centres for the districts of Ipswich, Lockyer Valley, Scenic Rim and Somerset.)

The third dimension is the product analysis. The five primary products used are:

- water – for core and non-core water services
- wastewater – for core and non-core wastewater services
- competitive services – for non-regulated services
- asset creation – captures the costs relating to the capital expenditure program that will primarily be capitalised
- support services – initially captures transactions that are not directly attributable to the other products (these transactions are subsequently allocated to the other products (in summation) through semi-automated processes).

With the formation of Queensland Urban Utilities, the five primary products above have been joined with district identifiers to facilitate district reporting. As Queensland Urban Utilities has five districts – Brisbane, Ipswich, Lockyer Valley, Scenic Rim and Somerset – the resulting combination of product codes is 25 (five products for each of the five districts).

The general ledger is linked to the job costing/asset management system so that most of the elementary transactions are generated directly in the job costing/asset management system. This provides for tight control to ensure that costs are captured in the appropriate groups.

A management reporting system that provides financial reporting at various levels of the business supplements the general ledger system. This is an in-house reporting system based on Microsoft Access and Microsoft Excel.

The general ledger system provides for the recording of budget and forecast values at the same low level as the transactions are captured. Budget-to-actual comparisons is the primary cost control mechanism available to Queensland Urban Utilities in its initial year. The budget forms the basis of the price submission data. The development of Queensland Urban Utilities budget for 2010/11 is outlined in section 5.11.

4.2 LEVEL OF DISAGGREGATION

The price monitoring framework applies to the two activities of Queensland Urban Utilities being:

- water distribution and retail activities
- wastewater distribution and retail activities.

These activities incorporate a range of services. Table 3 allocates the service to the activity and details the level of disaggregation of information that is available. For example, revenue information is available at the service level for trade waste. However information on operating expenses and assets is available only at the activity level.

Table 3 Current separability of data by service categories

Activity	Service	Revenue	Operating expenses	Assets
Water	**Drinking water** Potable water supplies to all customer classes.	Yes	Yes	Yes
	Other core water Queensland Urban Utilities has no other core water services.	N/A		
	Aggregate non-core water Sundry services, such as water connections, water meter testing, special meter reads and water efficiency management plan assessment.	Yes		
Wastewater	**Wastewater via sewer** Domestic strength wastewater from residential and non-residential customers and trade waste and recycled water where they are not currently separable.	Yes	Yes	Yes
	Trade waste Trade waste where currently separable from wastewater via sewer.	Yes		
	Other core wastewater Recycled water where currently separable from wastewater via sewer.	Yes		
	Aggregate non-core wastewater Sundry services, such as discharge of septic tanks, sewer connections and garbage grinders.	Yes		
	Non-regulated Consultancy, connection design and private plumbing works.	Yes	Yes	Not material

The QCA has also requested data at the district level based on the old council boundaries. While Queensland Urban Utilities has supplied information as requested it is strongly recommended that the QCA review the value of continuing to constrain Queensland Urban Utilities to old council boundaries. The most appropriate geographical level for cost reporting requires discussion as part of the development of the long-term pricing principles.

4.3 ALLOCATION PRINCIPLE

4.3.1 OPERATING COSTS

The formation of the operating cost budgets was based on the previous year's actual costs within each of the former five water businesses. Accordingly the majority of costs are directly attributable to the districts and to the products including support services.

Support services costs are subsequently reallocated to the other products based on direct labour costs. Direct labour is deemed to be appropriate as support costs are primarily labour and labour-driven expenses such as computers, accommodation and telephones.

Support costs are allocated at three levels – direct labour on-costs, local support costs and corporate overheads. Direct labour on-costs are the labour costs relating to costs such as sick leave, annual leave, superannuation and payroll tax. Local support costs relate mainly to local management and support staff within each department (sub-units within branches). Corporate costs include the majority of the costs of support functions of finance, human resource management, computer systems management and corporate services.

This three-tiered approach provides for a reasonable allocation of support costs to the core products.

4.3.2 ASSETS AND CAPITAL EXPENDITURE

Infrastructure assets are allocated directly to districts and activities.

Sundry property, plant and equipment, buildings other than infrastructure housing, and land are allocated directly to districts. Where there is a direct link to the activity they are assigned directly, with the remainder assigned using the 1 July 2008 infrastructure regulatory asset base (RAB) activity percentage. The majority of these assets are used in support of the infrastructure assets either to operate or maintain the assets. Therefore this is a reasonable causal basis for allocation. Further analysis may allow more assets to be directly linked to an activity.

Corporate systems, billing systems and establishment cost assets are allocated across districts using the district's percentage of total water and wastewater properties and then to activities within districts using each district's water and wastewater properties split. Properties serviced represent a reasonable causal connection to the use of the systems.

Allocation of the RAB value as advised by the Minister is detailed in section 5.5.

4.3.3 CASH CONTRIBUTIONS

Developer cash contributions are allocated to asset classes using growth-driven capital expenditure. The long-term forecasts of growth capital expenditure are converted to a net present value for each asset class. The resultant percentage splits are used to allocate the cash contributions across asset classes. This approach was used to match over time the expenditure at the asset class level, which is the driver of the future component of the cash contributions.

4.4 STATEMENT OF ACCOUNTING PRINCIPLES AND POLICIES

Queensland Urban Utilities is required to comply with the *Financial Accountability Act 2009*, *Financial and Performance Management Standard 2009*, *Statutory Bodies Financial Arrangements Act 1982* and the *Accounting Standards*. A *Financial Management Practice Manual* is in the process of being compiled. This manual will incorporate similar information as required by Queensland Government-owned corporations and departments.

Financial policies are being prepared to support the financial operations and governance of Queensland Urban Utilities. These policies will be approved in accordance with the Policy Framework, incorporated into the *Financial Management Practice Manual* and implemented as part of financial practice and culture.

Based on a review of the different financial policies applied by the five shareholding councils, there are a number of implications for Queensland Urban Utilities, particularly with respect to the capitalisation of assets.

- Water meters – Queensland Urban Utilities has determined that water meters will be capitalised and depreciated over the average useful life of the asset.
- Pre-design project costs will be expensed in the year incurred, unless there is evidence to support that the project will commence within a 12-month period.
- Borrowing costs that can be directly attributable to the acquisition, construction or production of a qualifying asset will form part of the cost of the asset.
- Thresholds – Queensland Urban Utilities has determined that the following thresholds will apply.
    - Tools of trade assets (including computer equipment) – $5000.
    - Other property, plant and equipment – $10,000.
    - Network assets – all network assets are capitalised.

The future valuation of assets (and hence the impact on depreciation) for accounting purposes is currently under review in consultation with the Queensland Audit Office.

All remaining financial policies will be reviewed prior to the end of the 2010/11 financial year.

5. INFORMATION REQUIREMENTS

5.1 STATUTORY ACCOUNTS AND BUDGET

The first set of statutory financial statements for Queensland Urban Utilities will be prepared for the period 3 November 2009 to 30 June 2010. It will be audited by the Queensland Audit Office, with the expectation of sign-off by external audit by 31 August 2010. The costs included in this set of financial statements will be the establishment costs for Queensland Urban Utilities and will be based on the criteria defined by the Queensland Water Commission.

5.2 REVENUE

5.2.1 BUILDING BLOCK APPROACH

Queensland Urban Utilities has calculated utility revenue using the standard building block approach.

The revenue-offset method has been used for the treatment of capital revenues. While forecast revenues have also been estimated under a revenue-offset approach, Queensland Urban Utilities has not formed a view on the method that will be used in the 2011/12 or 2012/13 financial years.

The maximum allowable revenue has been calculated at the entity level (whole of Queensland Urban Utilities) for each activity.

For 2010/11 a uniform price adjustment has been applied across all districts using the entity-level maximum allowable revenue for each activity.

5.2.2 ALLOCATION OF THE MAXIMUM ALLOWABLE REVENUE TO TARIFFS

Each shareholding council provided billing and property data to Queensland Urban Utilities to determine the required tariff increases based on the entity-level maximum allowable revenue.

Demand and growth assumptions used to determine 2010/11 tariffs are outlined in the table below.

Table 4 Demand and growth assumptions

District	Brisbane	Ipswich	Lockyer Valley	Scenic Rim	Somerset
Residential growth	1.60%	3.58%	3.27%	1.55%	1.55%
Non-residential growth	1.00%	0%	1.37%	1.00%	1.00%
Residential demand (litres per person per day)	175	175	158	158	158
Non-residential demand	As per current year but with adjustments for anticipated demand changes from specific large customers product change or substitution.				

5.3 SERVICE STANDARDS

Under the *South East Queensland Water (Distribution and Retail Restructuring) Act 2009* the Minister, by 30 June 2011, will make a water and wastewater customer code to provide for minimum and guaranteed service standards for the customers of the three distributor-retailers.

At present Queensland Urban Utilities operates under the customer service standards prepared by its five shareholding councils to comply with the *Water Supply (Safety and Reliability) Act 2008*.

Under the *Water Supply (Safety and Reliability) Act 2008*, the Department of Environment and Resource Management (DERM) provides guidelines for developing and reporting customer service standards, and monitors service provider compliance with agreed standards.

There is considerable variation in customer service standards across the state, across South East Queensland, and across Queensland Urban Utilities' operational area. This reflects wide variations in historical investment and geography. Queensland Urban Utilities has committed to ensuring that its customer service standards continue at a level equal to or better than those existing prior to its formation.

The standards required under the *Water Supply (Safety and Reliability) Act 2008* include both asset and retail service-driven standards. Categories for the latter include complaints management, service connections, billing, metering, accounting, and customer consultation and dispute resolution. Customer service standards including complaints and dispute resolution, customer consultation, accounting, metering or billing can be found in our *Customer Service Charter*.

The interim *Customer Service Charter* is attached as Annex 2.

Ensuring all of Queensland Urban Utilities' customers receive at least the minimum agreed and regulated service standards is a key element of decision making on future operating, maintenance and capital expenditure.

Compliance to these standards is monitored through Queensland Urban Utilities' Integrated Management System Framework. This framework sets out the governance arrangements for the development, maintenance and application of management systems across the business and supports the delivery of water and wastewater services to our customers. Queensland Urban Utilities will review and report its achievements against its targets annually.

5.4 DEMAND FORECAST

The forecast demand for water and wastewater activities is a key input into capital and operational expenditure decisions.

Queensland Urban Utilities forecasts water demands, sewage volumes and recycled water usage on an annual basis. These forecasts are correlated with projections developed for the Queensland Government by the Queensland Water Commission, primarily through its *South East Queensland Water Strategy*.

Water demand projections are also reviewed on a monthly basis through the confirmation of Grid Instructions that are issued by the Water Grid Manager.

5.4.1 DEMAND DRIVERS

There are various demand drivers in making decisions on capital expenditure, forecast operating expenditure and tariff setting.

The major drivers of annual water demand are:

- population growth
- industrial and commercial growth
- the setting and enforcement of water restrictions and the change in water use behaviour by customers, and the level of water efficiency implemented on customer premises
- the level of background leakage, both in the utility network and on customer premises.

5.4.1.1 Population growth

Population growth projections when combined with design standards, define the future capacity requirements of the system to meet the service standards in place. The population projections used by Queensland Urban Utilities are drawn from a variety of sources and are updated periodically in response to:

- updates to high-level strategic directions and principles provided in the *South East Queensland Regional Plan* prepared every five years by the Queensland Government previously under the *Integrated Planning Act 1997* (IPA), now the *Sustainable Planning Act 2009*
- regular detailed projections of population dynamics, residential dwelling activity and urban land supply provided by the Queensland Government's Population Information and Forecasting Unit (PIFU)
- town planning decisions made by shareholding councils under the *Local Government Act 1993* and the Urban Land Development Authority under its 2007 Act.
- requests and feedback from Queensland Urban Utilities' major customers, particularly land developers and large industrial customers.

Approximately half of Queensland Urban Utilities' capital program is driven by the anticipated population growth across the region. The new assets built for this purpose are identified in Water and Sewerage Master Plans and Planning Scheme Policies (PSPs) that are updated at least every five years, in accordance with the *Sustainable Planning Act 2009*. This ensures that Queensland Urban Utilities is proactively planning and investing wisely for the long-term benefit of its customers.

The following population projections demonstrate the substantial and rapid population growth forecast for the region, drawing on both the *South East Queensland Regional Plan 2009-2031* 's targets and the estimates and projections provided for 2009 by the PIFU.

Table 5 Population growth forecast

Regions	PIFU estimated population 2009	PIFU projected resident population at 2031			Regional Plan Planning targets 2031
		Low series	Medium series	High series	
Brisbane	1,052,458	1,155,102	1,220,543	1,275,452	1,270,000
Ipswich	162,383	385,081	434,788	532,581	435,000
Lockyer Valley	35,633	54,632	57,443	63,219	166,000
Scenic Rim	37,419	61,958	71,042	97,838	
Somerset	21,608	30,055	32,778	35,940	
Queensland Urban Utilities area total	**1,309,501**	**1,686,828**	**1,816,594**	**2,005,030**	**1,871,000**

In the next 20 years, the population in Queensland Urban Utilities' operational area is forecast to increase by approximately 40%.

Importantly, this growth will vary from geographic area to area. The strongest growth, in both percentage and absolute terms, is expected to occur in Ipswich, with a forecast growth of 270,000 people – a 168% increase based on 2009 population figures.

Local governments anticipate managing this growth differently. In Ipswich, the focus is on greenfield development – the urbanisation of land. In contrast, Brisbane plans to use a mix of greenfield development and brownfield urban infill and densification. Greenfield and brownfield infrastructure provision provide a variety of different costs and challenges.

Land use planning is primarily a local government function. However, there are some land areas within Queensland Urban Utilities' service area that fall under other planning jurisdictions. These include land under the jurisdiction of the Urban Land Development Authority, Port of Brisbane Corporation and Brisbane Airport Corporation. All entities responsible for land use planning are required to ensure their planning schemes are consistent with the Queensland Government's *South East Queensland Regional Plan 2009-2031*.

Local governments develop population and employment projections for their local government area (LGA) based on various planning schemes and inputs such as census data, Queensland Planning Information and Forecasting Unit (PIFU) projections, development activity, the *South East Queensland Regional Plan 2009-2031* targets and economics analyses.

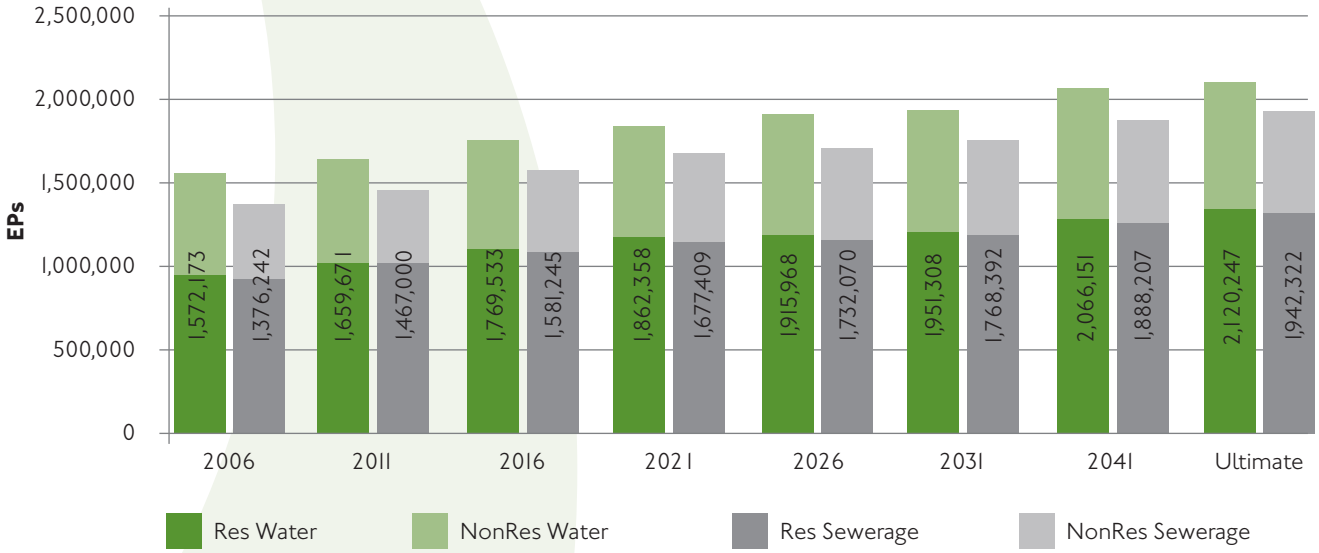
Queensland Urban Utilities derives equivalent population (EP) projections from local government population and employment projections. These relate only to the serviced population, and take into account the relative demands of different development types, such as high density residential, industrial and commercial, compared to low density residential. Industrial development and population densities will increase at different rates across the Queensland Urban Utilities' service area.

Land use planning is continuously evolving, with changes occurring regularly as local planning and strategic planning is undertaken and reviewed. The following subsections outline the current EP projections for each LGA serviced by Queensland Urban Utilities.

Over the next 20 years Queensland Urban Utilities is anticipated to need infrastructure to service the demands of an additional 500,000 people. As with most infrastructure activity, almost all of the investment is required prior to development occurring – capital expenditure leads development in order to ensure adequate water pressures and flows are sustained, and wastewater transportation and treatment capacity is available. This leads to a high capital investment requirement in both the provision of new infrastructure to service this growth, and augmentation of existing infrastructure capacity.

The following outlines Queensland Urban Utilities' present EP projections, current at April 2010 and in use for network planning purposes. These projections include information from local plans, urban renewal area plans and Urban Development Areas (UDA) for which future land uses were reasonably certain.

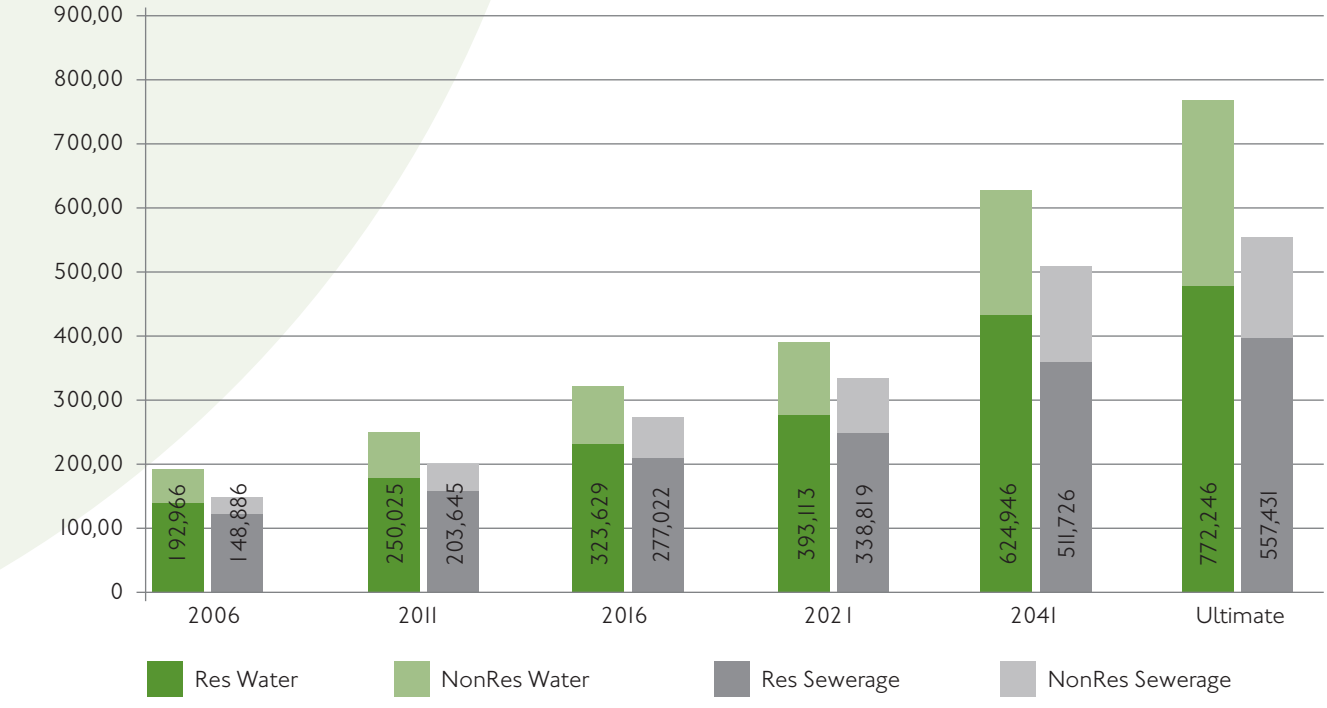
Figure 3 Brisbane water supply and sewerage projections



The majority of growth in Brisbane City is expected to occur as infill in urban renewal areas and transit-oriented developments. Major areas of growth over the next 10 to 15 years will be in the UDAs at Northshore Hamilton, Bowen Hills and Fitzgibbon, and other areas identified for high-density development such as West End/South Brisbane, Woolloongabba, Milton, Toowong/Auchenflower and Fortitude Valley. These will cater for a mix of residential and commercial uses. Major greenfield development will occur at Rochedale and Willawong/Pallara (Oxley Wedge), primarily as low density residential. The major industrial/commercial growth will occur in the Australia TradeCoast area, around Brisbane Airport and in the Richlands/Wacol area.

The following figure shows Ipswich EP projections current at 2007 on which current network planning is based.

Figure 4 Ipswich water supply and sewerage projections EP projections



N.B. The sewerage EP projections exclude Ebenezer and Rosewood Catchments.

Major growth areas for Ipswich over the next 10 to 15 years are Springfield and Ripley Valley.

For Lockyer Valley, Scenic Rim and Somerset districts, EP projects are not yet available and PIFU projects are presently used.

5.4.1.2 Industrial and commercial growth

Industrial and commercial demands are a large component of the volumes of water and wastewater transported. In the Brisbane and Ipswich districts these constitute approximately 41% of the 2008/09 total customer demand. Generally, industrial and commercial demand follows population growth, and a similar percentage of the total customer demand is anticipated in the short term.

5.4.1.3 Water restrictions and water efficiency

One of the key demand management tools is the Permanent Water Conservation Measures water restrictions established by the Queensland Water Commission in December 2009. Water restrictions have been used across South East Queensland by the Queensland Government to significantly reduce consumption in recent years due to the reduction in available water supply during the millennium drought. With the ending of the drought, the Queensland Government recognised the benefit of moving towards permanent water conservation measures to maintain the cultural change in the community's use of water, smooth the increase in demand coming out of high-level water restrictions and reduce ongoing demand.

This cultural change in consumption has also seen a steady increase in customers' water use efficiency. This is due both to the mandating of water efficient fixtures in new development, and to a lesser extent, from customers retrofitting water efficient fixtures and appliances to existing premises.

Recent water use behaviour has been heavily influenced by the drought. Both the setting of relatively harsh water restrictions and community perceptions of water scarcity have lead to extremely large drops in unit consumption rates.

It is anticipated that this relatively low per-capita consumption will continue in the short term, with potentially some upwards creep over the longer term as a response to the recently relaxed water restrictions, as the community develops a growing sense of water security and availability.

Queensland Urban Utilities forecasts that demand will plateau at between 200-230 litres per person per day (L/p/d) and has set infrastructure design standards accordingly. This target has been set in coordination with the Queensland Water Commission.

The shareholding council water businesses that are now integrated into Queensland Urban Utilities were required to have Demand Management Plans in operation as part of their Total Management Plans. Water demand management generally incorporates several complementary strategies to reduce residential and commercial water consumption, including water conservation programs, educational campaigns, pricing, water restrictions (managed by the Queensland Government) and pressure and leakage management.

These plans will be merged and updated as part of the introduction of Queensland Urban Utilities' *Water Netserv Plan*. Queensland Urban Utilities is required under legislation to have its *Water Netserv Plan* in place by 1 July 2013. The *Water Netserv Plan* supports and reflects the regional planning conducted by the Queensland Government and the local planning of the five local government areas that make up Queensland Urban Utilities' operational area.

5.4.1.4 Non-revenue water

Non-revenue water is the difference between water purchased by Queensland Urban Utilities and the water billed to our customers. There are a number of factors that prevent the total amount of bulk water delivered being recorded as passing on to a customer's meter. These include background leakage, legal and illegal unmetered consumption, unbilled metered consumption and meter inaccuracies.

While the total quantity of non-revenue water is calculable, Queensland Urban Utilities is generally forced to estimate the quantity attributable to various sources of non-revenue water.

5.4.1.4.1 Background leakage

Background leakage is the major component of the difference between water purchased by Queensland Urban Utilities and the water sold to its customers. Background leakage is due to the nature and history of the infrastructure and technology used in water supply networks. Background leakage can be managed and reduced, but the benefits must be weighed against the costs.

Regulation by the Queensland Government in response to the drought has driven significant expenditure by water service providers on leakage reduction. In 2006, the Queensland Government mandated the implementation of the South East Queensland Pressure and Leakage Management Program (PLMP). As at the end of March 2010, the program had seen reductions in non-revenue water for Queensland Urban Utilities of approximately 29 ML/day, or 22 L/p/d.

Some causes of background leakage are more easily and cheaply dealt with than others. The program, having principally met its objectives, is due to end between 2010 and 2012 and continued savings will taper off. Given that early efforts at reducing leakage rightly focused on 'easy wins' it is expected that further leakage reductions will become relatively less economically sensible to pursue as additional leakage management project benefit/cost ratios decrease.

Reducing background leakage is difficult as not all leakage is detectable. Although leakage management will continue to be a priority into the future, the water industry has recognised that, with current technology, some background leakage cannot yet be detected and therefore repaired. This level of leakage is referred to as 'unavoidable background leakage'. Recent sustained efforts into leakage reduction by the Australian industry has indicated that even with the latest leakage

management techniques deployed, unavoidable background leakage is currently in the order of 50-80 litres per connection per day. In the short term, Queensland Urban Utilities' unit non-revenue water should continue to trend downwards, however overall will grow with the number of additional connections occurring through growth.

Ultimately leakage, both avoidable and unavoidable, leads to increased costs to customers due to the need to purchase and transport larger volumes of water than customers demand. But equally, there comes a point where the cost of reducing leakage outweighs the benefit of doing so.

5.4.1.4.2 Illegal and legal water use

In determining its management of non-revenue water, Queensland Urban Utilities also estimates and reports water that is legally used by customers but is not paid for, and water that is illegally removed from the network.

The primary activity in the legal water use category is water provided to fire fighting systems and fire fighting. Under s144 of the *Water Supply Act*, water service providers must provide this water for free. Water used in fire fighting systems may be used for testing the system. However, it is also not uncommon for people to use fire fighting systems for other uses. For example, using the fire hose to clean an area, which is illegal.

Legal water use also includes water used by Queensland Urban Utilities itself, primarily during construction of assets and for clearing and cleaning its networks.

Illegal water use generally comes in two forms – illegal connections and direct theft.

Some users may have illegal connections to the water and wastewater network. Typically in recent drought affected times and with improved network services, the number of illegal connections has declined.

There is also direct theft of water from the network. Anecdotally, this is mostly in the form of water carriers (tankers) removing water from the network, typically from fire hydrants, rather than travel to Queensland Urban Utilities' supply points, as the time and fuel costs of such travel are sometimes perceived as substantial. The quantities of stolen water are estimated to increase significantly during periods of high restrictions on water usage when use of carried water increases.

5.4.1.5 Customer meters

The limitations of customer meters also add to the total of non-revenue water. The nature of the meters used is such that they are far more likely to under-report than over-report i.e. there is no self-balancing. Studies have shown that under very low flows, meters may under-report or not report at all, as the flow is unable to overcome the natural friction in the meter. Such low flows often occur as a result of a minor leak within a property's plumbing system.

Queensland Urban Utilities has an extensive meter maintenance and replacement program which seeks to minimise the quantity of consumption that goes unrecorded.

5.4.1.6 Wastewater Network Infiltration

Wastewater network inflow and infiltration comprises the groundwater and stormwater that enters the dedicated wastewater system. This inflow and infiltration constitutes the difference between the quantities of wastewater collected from customers via toilets, sinks, bathtubs, showers and trade waste, and the quantities received and treated by water reclamation plants. A continuous base groundwater infiltration occurs during dry weather, which typically makes up around 25% of the total dry weather flow in the network. During rain events, direct stormwater inflow occurs and infiltration increases resulting in peak wet weather flows that are several times greater than the average dry weather flow. The magnitude of wet weather flows is dependent on the condition of the pipe network, the prevalence of illegal connections and the intensity, duration and extent of the rainfall.

Various actions have been undertaken by Queensland Urban Utilities to reduce inflow and infiltration. These include flow monitoring, hydraulic modelling and inspections to identify and then rectify defects – replacement or relining of sewers in poor condition, and identification of illegal connections using techniques such as smoke testing to reveal roof water systems that are connected to the wastewater network. Approximately half of the inflow/infiltration entering the wastewater network occurs in customers' private drainage and Queensland Urban Utilities may issue a notice to customers requiring them to undertake any necessary repairs. All new sewers installed within Queensland Urban Utilities' service area are proposed to be welded polyethylene pipe systems (NuSewers) that are essentially a sealed system that will experience dramatically reduced levels of inflow/infiltration compared to traditional systems.

Importantly, inflow and infiltration have a significant influence upon asset design and maintenance and therefore cost. It is not possible to eliminate inflow/infiltration from a traditional sewerage system and the extent of actions to reduce it must strike a sensible balance between costs and benefits. Inflow into the wastewater system during wet weather is significant, so to avoid unacceptable overflows, sewers must be designed with capacity to accept sudden and significantly larger flows than would be necessary to transport wastewater generated by customers on a day-to-day basis.

5.5 REGULATORY ASSET BASE

Queensland Urban Utilities' asset base consists of water and wastewater assets from the Brisbane, Ipswich, Somerset, Lockyer Valley and Scenic Rim Councils.

The value as advised by the Minister for Natural Resources and Energy and the Minister for Trade for the Regulatory Asset Base (RAB) as at 1 July 2008 has been assigned on a district basis. Each shareholding council's value, as advised, has been allocated to the written down value (WDV) at the asset level in the fixed asset registers as provided by the shareholding

councils. Esk Gatton Laidley Water Board's RAB has been allocated 80% to Lockyer Valley and 20% to Somerset. The assets have been assigned to Lockyer Valley district, as separation on use was not material or practical.

In arriving at the 1 July 2008 WDV for each district, all assets owned at that time and known to be transferring to Queensland Urban Utilities were included. Where the assets were reported separately for water and wastewater within each council's Annual Financial Statements they were checked against the register values. Not all assets, such as land and buildings, are identified specifically as water and wastewater assets in the council's Annual Financial Statements.

To populate the *QCA Data Template* the following approaches were adopted:

Council	Approach
Brisbane	30 June 2008 asset register excluding bulk water assets.
Ipswich	30 June 2008 asset register.
Lockyer Valley	Due to council amalgamation, the 14 March 2008 asset register was used as no additions or disposals occurred prior to 30 June 2008. Esk Gatton Laidley Water Board's asset register as at 14 March 2008 was used.
Scenic Rim	30 June 2009 asset register was used as a revaluation was conducted between 15 March and 30 June 2008. This led to new asset identifiers and a new register. Assets added over the 2009/10 financial year were identified and removed and depreciation was calculated on a straight line to match regulatory requirements in determining a 1 July 2008 WDV.
Somerset	30 June 2009 asset register was used, as a combined register with Kilcoy and Esk assets was available. This register also provided asset movement information for the year.

5.6 CAPITAL EXPENDITURE

Shareholding councils provided information on actual capital expenditure and capitalisations for 2008/09 and forecasts for 2009/10 at the asset class level. The difference between opening and closing capital in progress (CIP) was used with capitalisations to check capital expenditure amounts in total. Capital expenditure is used for these two interim years as per the Ministers' direction and referral.

Queensland Urban Utilities in calculating the maximum allowable revenue for pricing purposes in the 2010/11 year used forecast capital expenditure based on it's understanding of the information requirements. Subsequent discussions with QCA have indicated that the QCA's preference is for capital to only be added to the RAB as it is commissioned. Queensland Urban Utilities would like the opportunity to discuss this further with the QCA as this is not the common practice among regulators. However, prior to this discussion the capital expenditure from 2010/11 onwards has been forecast on a commissioned basis in the *QCA Data Template*.

Capital expenditure that is not commissioned in the year of expenditure has in the year of expenditure six months of interest capitalised (at the regulatory weighted average cost of capital). For each year following this where the project is not commissioned, a full year's interest is capitalised on the previous expenditure. This process is mirrored for each additional year while the project is not added to the RAB. In the year the project is commissioned, and the project CIP is added to the RAB, the carried forward amount from the previous year's CIP has six months interest capitalised.

5.7 CONTRIBUTED, DONATED AND GIFTED ASSETS

5.7.1 DONATED ASSETS

The shareholding councils provided information on donations by asset class for 2008/09 and forecasts for 2009/10. The 2008/09 donations were checked against the shareholding councils' Financial Statements in their Annual Reports.

Somerset received an extraordinary donation for water assets from the Queensland Government in 2008/09. The relative size of this donation compared to Somerset's annual utility revenue did not allow for a compensating offset against maximum allowable revenue, as is the standard practice for the revenue-offset method. Given this, Queensland Urban Utilities has not included this value in the donations added to the RAB and recorded this as a regulatory adjustment in worksheet 5.1.5 (marked as a 2008/09 adjustment) in the *QCA Data Template*. This adjustment is done to avoid Queensland Urban Utilities potentially charging customers for assets that Somerset did not pay for and would not have been able to reduce utility charges to account for in a short period of time. This does not constitute a change from the revenue-offset to the asset-offset method for Queensland Urban Utilities.

The majority of donations are for local infrastructure including mains and connections that fall into the distribution asset class. However, on occasions a developer could previously have negotiated with their local council (now it would be with Queensland Urban Utilities) to build some trunk infrastructure that is usually formalised through an infrastructure agreement.

The degree to which this will occur will be influenced by Queensland Urban Utilities' policy. In these circumstances the developer may receive an offset against planning scheme policy (PSP) charges they are obligated to pay.

The 2010/11 budget and forward forecasts for donations are as provided by the shareholding councils. Brisbane forecasts donations by applying the yearly difference in the growth rate used in the PSPs to adjust the previous year's budget or forecast.

In forecasting local donations, Ipswich applies a property growth rate (lots) based on the *South East Queensland Regional Plan 2009-2031* and uses an historical expenditure per lot. They have also forecast donations of trunk infrastructure. Queensland Urban Utilities has used these forecasts, as these trunk assets have not been included in the Ipswich district capital program. However, once the Queensland Urban Utilities' policy on donations of trunk infrastructure is developed, some or all of these large donations could be transferred to the capital program.

Lockyer Valley forecasts donations at a growth rate of 2% on the forecast for 2009/10. Scenic Rim and Somerset have not forecasted donations. Queensland Urban Utilities will investigate if an appropriate forecasting methodology can be developed for these districts when examining a common forecasting method across all districts.

5.7.2 DEVELOPER CASH CONTRIBUTIONS

Brisbane's 2010/11 budget for cash contributions is based on shareholding council information using development approvals, forecast approvals and historical trends. The number of infrastructure units applied in each development approval is the maximum available for collection. This amount is then reduced by a percentage based on the number of years since the approval was given and the expected percentage of approvals that will expire without payment. These percentages are based on historical payment patterns. A further reduction is made to exclude the bulk water component of the water charges. While Brisbane City Council offers developers a discount under certain conditions, the gross amount is to be remitted to Queensland Urban Utilities. Forecasts after 2010/11 smooth the transition to the expected *Priority Infrastructure Plans* (PIP) forecast charges.

Ipswich utilises the growth in lots from the previous year to forecast the lots for which contributions will be received. These lots are then multiplied by the previous years average contribution value per lot indexed by the rate applied to the infrastructure charge units for the forecast year.

Lockyer Valley and Scenic Rim's forecasts are as supplied to the Council of Mayors (SEQ) water reform program by those councils. Somerset has not forecasted developer cash contributions.

Queensland Urban Utilities intends to investigate an appropriate method of forecasting developer cash contributions across all districts.

Developer cash contributions are forecast at an average charge, with this high level information provided in 5.7.1 SD03 of the *QCA Data Template*, whereas there may be many and wide ranging charges within each district. To supplement this information the current infrastructure charges by district are included in Annex 3.

5.8 DEPRECIATION AND DISPOSALS

Depreciation for regulatory purposes is based on RAB values. Depreciation calculated from the fixed asset registers for 2007/08 is used to provide an average existing asset life by asset class, as at 1 July 2008. Each asset class RAB value is divided by the year's depreciation.

The average life is then used to calculate depreciation on the opening value of the asset class. In addition 50% of each year's capital expenditure is depreciated at the nominal life assigned to the appropriate asset class. Queensland Urban Utilities has calculated depreciation in this way to match the expected QCA preferred method.

Depreciation in the financial statements (5.1.1 in *QCA Data Template*) for 2008/09 and 2009/10 are WDV depreciation. From the 2010/11 budget forward, depreciation is based on RAB values.

Disposals were taken from the fixed asset registers, shareholding council advice and where possible, checked against the shareholding council's Financial Statements. Disposals were then adjusted from a WDV to a RAB value. These were then assigned to an asset class level using more detailed information supplied by the shareholding councils.

Disposal values equivalent to WDV based on RAB are included under gross in 5.5.2 SD01 in the *QCA Data Template* as regulatory gross and accumulated depreciation will not be tracked individually.

5.9 INDEXATION

Indexation for 2008/09 is based on the ABS Brisbane all groups consumer price index of 2.0% for June to June. For 2009/10 an inflation forecast of 2.5% has been used. The inflation forecast used in the WACC is applied going forward.

5.10 RETURN ON CAPITAL

The following details Queensland Urban Utilities' target return on capital for each year of the interim period from 1 July 2010 to 30 June 2013 including the values attached to the key underlying parameters and the method of WACC calculation.

Given this is the first time Queensland Urban Utilities has nominated a target return on capital, Queensland Urban Utilities has engaged Competition Economics Group (CEG) to provide guidance on the WACC parameters. A copy of CEG report has been included as Annex 4. Queensland Urban Utilities has considered this report and sought further independent advice. Using the reports provided, Queensland Urban Utilities has proposed a WACC of 10.25%. The approach selected to determine the WACC has been selected by Queensland Urban Utilities as we believe it is representative of standard regulatory practice. As noted earlier, a WACC of 9.2% was used for the purposes of price setting for 2010/11. However, we would expect that the QCA would use the proposed WACC of 10.25% in assessing the maximum allowable revenue.

5.10.1 RISK-FREE RATE

The risk-free rate of 5.43% is based on the 20-day average of the 10-year Commonwealth Government Securities (CGS) rates for the period 7 May to 3 June 2010. This represents commonly accepted regulatory practice and the term of the risk-free rate used in the Capital Asset Pricing Model (CAPM) to calculate the cost of equity should reflect the long-run returns expected by shareholders, which is best proxied by the 10-year CGS, not the five-year CGS. A 10-year CGS is also consistent with a 6% market risk premium.

5.10.2 CAPITAL STRUCTURE

Queensland Urban Utilities proposes the cost of capital to be based on 60% debt gearing assumption, giving rise to a credit rating of BBB+ as recommended in the *CEG report*. A capital structure of 60% debt matches interstate regulators assumptions for urban water entities as well as for electricity and gas entities.

5.10.3 DEBT MARGIN

Queensland Urban Utilities has adopted the seven-year BBB Bloomberg estimate of debt costs extended to 10 years by extrapolating from the shape of the Bloomberg AAA corporate debt curve to estimate a 10-year debt margin. This was measured over the same period as the risk-free rate, resulting in a debt margin of 455 basis points. The sole use of the Bloomberg data rather than the CEG recommended mid-point between Bloomberg and CBA Spectrum is based on the arguments put forward by QCA in recent reports indicating a preference for Bloomberg. A debt raising cost of 12.5 basis points is added resulting in an overall debt margin of 4.68%.

5.10.4 DEBT BETA

Queensland Urban Utilities has adopted a debt beta of 0.11 consistent with that previously recommended by the QCA for the Gladstone Area Water Board. In this report the issues with the current high debt margins leading to abnormally high debt betas when the standard formula was applied were raised. Queensland Urban Utilities notes that to avoid the higher calculated debt beta being applied in the QCA building block model either a correction to 0.11 will be required within the model or the application of asset beta that results in the Queensland Urban Utilities equity beta of 0.84. For 5.10.0 in the *QCA Data Template*, a higher asset beta has been input to result in the Queensland Urban Utilities WACC for analysis within the QCA building block model.

5.10.5 BETA

There is no evidence that urban water has a systematic risk that is less than energy and in earlier electricity distribution decisions asset betas of 0.45 have been applied. QCA in the recent draft Queensland Rail decision accepted an asset beta of 0.45. Queensland Urban Utilities has adopted an asset beta of 0.43 which when using the Conine formula with a debt beta of 0.11, a capital structure of 60% debt and gamma of 0.5 results in an equity beta of 0.84.

5.10.6 MARKET RISK PREMIUM

The *CEG report* concludes that a market risk premium (MRP) of 6.5% as applied by the Australian Energy Regulator (AER) in recent electricity decisions is conservative. Queensland Urban Utilities recognises that the use of a 6.5% MRP by AER was the result of a specific set of circumstances and proposes the use of the accepted practice of 6.0%. This recognition though is based on the use of 10-year CGS to estimate the risk-free rate.

5.10.7 GAMMA

Queensland Urban Utilities has adopted 0.5 for gamma reflecting QCA regulatory precedent.

5.10.8 INFLATION

Queensland Urban Utilities considers the approach adopted by the QCA in the recent Gladstone Area Water Board report of using the mid-point in the Reserve Bank of Australia's target range of 2% to 3% reasonable. The inflation rate used is 2.5%.

5.10.9 WACC PARAMETERS

Queensland Urban Utilities' proposed parameter estimates are presented in the following table, along with the recommended values proposed by CEG. A lower and upper bound is presented for the CEG estimates due to the recommended equity beta range.

Table 6 WACC parameters

Parameter	CEG Table 2 – Lower bound	CEG Table 2 – Upper bound	Queensland Urban Utilities' proposal
Risk-free rate	5.43%	5.43%	5.43%
Debt to total value	60%	60%	60%
Debt margin	3.87%	3.87%	4.68%
Market risk premium	6.5%	6.5%	6.0%
Gamma	0.5	0.5	0.5
Tax rate	30%	30%	30%
Asset beta	N/A	N/A	0.43
Debt beta	N/A	N/A	0.11
Equity beta	0.8	1.0	0.84
Inflation	2.5%	2.63%	2.5%
Cost of equity	10.63%	11.93%	10.46%
Cost of debt	9.3%	9.3%	10.11%
Nominal vanilla WACC	9.83%	10.35%	10.25%

5.11 OPERATING COST

5.11.1 BUDGET DEVELOPMENT

The budget for 2010/11 forms the foundation of the financial forecast analysis and is primary input for the pricing of services for 2010/11. Accordingly, Queensland Urban Utilities undertook a structured approach to the development of its budget for 2010/11.

The budget was developed in two stages. Firstly, the five existing water businesses were each asked to prepare a budget for their business for 2010/11, as if their business would continue without any institutional reform. These budgets were referred to as the 'as is' budgets.

The Budget Framework for 2010/2011, including the key assumptions, was approved by the Establishment Committee of Queensland Urban Utilities on 3 December 2009 and detailed Budget Guidelines were provided to each council. Each council has confirmed that the 'as is' budget was developed in accordance with those guidelines. Significant review and refinement of the budget has occurred. This has involved an account-level review of the budget and comparison to historical trends (at least three years prior) and forecasts for the 2009/2010 year.

The second stage involved the determination of the changes for the formation of Queensland Urban Utilities and merging of the five water businesses. Key managers involved in the business formation project prepared budgets. The budgets prepared by these project managers were referred to as the 'to be' budgets. Significant review and refinement of the 'to be' budget has also occurred.

The Queensland Urban Utilities budget was then formed from a combination of the 'as is' and 'to be' budgets.

5.11.1.1 Asset operations

The majority of the asset operations 'as is' budget was developed following the zero base budget approach. This bottom up approach was applied to the following key components.

- Asset maintenance (materials, services, internal resource requirement)
- Planned schedule maintenance
- Corrective maintenance
- Responsive maintenance
- Planned special project maintenance
- Operations (electricity, chemicals, sludge)
- Resources (labour, fleet)

5.11.1.1.1 Asset maintenance

The asset maintenance component of the budget was developed using the following framework.

- Identify the assets that are currently being managed by the organisation.
- Establish the maintenance requirements and associated strategies for those assets to ensure regulatory and service level requirements are met.

Planned schedule maintenance

- Develop the planned maintenance schedule of works for each maintainable asset.
- Forecast the planned maintenance schedule over the financial year.
- Against each program of works estimate material, services and resource requirements and associated costs.

Corrective maintenance

- The historical corrective maintenance expenditure trend for each asset class is analysed. This historical trend is cross referenced with the inspectional work as per the maintenance schedule. Costing is adjusted for the following financial year.

Responsive maintenance

- The historical responsive maintenance expenditure trend for each asset class and work type is analysed. Costing is adjusted for the following financial year with consideration to asset condition.

Special project maintenance

- The special projects to be undertaken in the financial year are listed, justified and budgeted as separate non-capitalised projects. This includes items such as safety improvements, minor modification, blasting and painting.

It is noted that this process is undertaken at the standard job level.

5.11.1.1.2 Operation

The operations budget is developed using various models which include the following:

- Chemical model – Historical analysis of chemical usage is undertaken with reference to the wastewater flow rates experienced for each Wastewater Reclamation Plant (WRP). The catchment area forecast flow rates are applied to this chemical consumption rate for the financial year.
- Sludge model – Historical analysis of sludge generation is undertaken with reference to the wastewater flow rates experienced for each WRP. The catchment area forecast flow rates are applied to this sludge generation rate for the financial year. This model takes into consideration the Oxley Creek WRP Cambi Process, which imports sludge from other plants for further biological treatment and electricity generation.
- Electricity model – Historical analysis and forecasting of each metered site is undertaken. The associated tariff is applied to each site. Non-metered sites are budgeted at the appropriate flat rate. This model accounts for anticipated green electricity generation upon the applicable sites.

5.11.1.1.3 Resources

The Maintain Resource Model is based upon the requirements identified in the Asset Maintenance budgetary process.

The Operational Resource Model is based upon the known operating requirements of the asset base.

5.11.1.1.4 Future budget preparation 2011/12

In areas where budget development and maintenance strategy differs from the above, as of 1 July 2010, Queensland Urban Utilities is actively engaged in a program to collate the asset/equipment listings and base maintenance requirements to standardise and align the budget and asset management strategy.

5.11.2 PREPARATION OF FORECASTS

Operating costs for 2011/12 and 2012/13 have been forecast by applying cost indices and growth factors to the 2010/11 budgeted costs. This has been carried out at the high-level grouping of expenses by district and product as set out in the following table.

Table 7 Expenses by district and product

Expense group	Cost index		Growth factor					
	FY 12	FY 13	Brisbane	Ipswich	Lockyer Valley	Scenic Rim	Somerset	Corporate
Reference – population growth (PIFU forecast)			1.33%	5.44%	2.83%	3.3%	2.57%	1.97% (QUU total)
Direct labour	4.30%	4.25%	1.00%	1.50%	1.50%	1.50%	1.50%	0%
Indirect labour								0%
Bulk water	Estimate bulk volumes at Water Grid Manager forecast prices indexed at 2.5% pa							
Electricity	2.50%	2.50%	Aligned to percentage change in bulk water volume					
Chemicals	2.50%	2.50%						
Sludge handling	2.50%	2.50%						
Infrastructure	2.50%	2.50%	N/A	N/A	N/A	N/A	N/A	N/A
Doubtful debts	Estimated at 0.5% of forecast utility and sundry revenue							
Other costs	2.50%	2.50%	0.25%	0.40%	0.40%	0.40%	0.40%	0.27%

5.12 THIRD PARTY TRANSACTIONS

Queensland Urban Utilities has made a commitment to work collaboratively with shareholding councils so that the existing contractual relationships are not negatively impacted by the creation of the new, separate entity.

As a result, and to ensure the seamless provision of goods and services, a number of different contractual arrangements are required from related and third party sources.

Third party transactions are imperative to ensure that Queensland Urban Utilities can continue to deliver a high quality service to our customers. They include capital works contracts through to operational contracts for biosolid removal, electricity, printing, banking and water meter replacements. These contracts have been awarded through an open tender process through the shareholding councils.

Prior to the establishment of Queensland Urban Utilities, the water businesses were bound by the respective shareholding council's procurement rules, which are outlined in the *City of Brisbane Act* for Brisbane City Council and the *Local Government Act* for all other councils. The water businesses managed 'water only' procurement, for goods and services such as water meters, chemicals, biosolid removal and capital works. Councils have undertaken the procurement of all other goods and services with the water business purchasing through corporate council contracts.

From 1 July 2010, Queensland Urban Utilities is bound by the State Procurement Policy and has a detailed *Procurement Manual* that outlines the policy framework and procedures for procurement, contracting and tendering.

Queensland Urban Utilities will continue to independently manage the procurement for 'water only' goods, services and capital works projects.

However, given the large number of goods and services that Queensland Urban Utilities purchases through corporate council contracts, it is not feasible to replace these contracts in the short term. As a result, Queensland Urban Utilities will continue to purchase via corporate council contracts for generic goods and services in the short to medium term. These contracts have been entered into through a value for money, open tender process. For example, generic goods and services include:

- banking and payment channels
- bulk fuel
- contract/temporary labour hire
- corporate wardrobe and protective clothing
- desktop computer hardware and related services
- hire of major and minor plant, trucks and specialised equipment
- infrastructure design and consulting services/engineering services
- legal services
- marketing and advertising services
- passenger and light commercial vehicles – dealers
- petrol
- printing
- software licences, maintenance and support
- stationery
- telecommunications.

Table 8 Ongoing corporate council contracts

Council	Number of corporate council contracts identified
Brisbane City Council	161
Ipswich City Council	18
Lockyer Valley Regional Council	4
Scenic Rim Regional Council	6
Somerset Regional Council	1

5.13 RELATED PARTY TRANSACTIONS

From 1 July 2010, shareholding councils will also provide a number of goods/services to Queensland Urban Utilities and vice versa. Queensland Urban Utilities and the shareholding councils have now agreed on these specific services. Significant agreements include the provision of the call centre, financial management system and payroll processing.

The agreements have been developed collaboratively and in good faith between Queensland Urban Utilities and each shareholding council and are based on the following principles and objectives.

- Achieve best value for money.
- Deliver procurement services efficiently.
- Effectively balance key user's needs with efficient, cost effective procurement.
- Establish effective working relationships with key customers.
- Establish a culture of collaboration.
- Ethical behaviour and fair dealing.

To ensure a mutually beneficial outcome for both Queensland Urban Utilities and shareholding councils, a set of clear 'pricing principles' was implemented including:

- open book approach
- full cost pricing provided
- allocation of shared costs on a commercial basis
- the pricing approach may be different to the past
- reasonable margin
- benchmarking and market comparison, where possible.

5.14 NON-REGULATED SERVICES

Queensland Urban Utilities has several services that are open to competition by other parties. These services are technical consultancies, connection design and private plumbing works.

Customers have an option to use Queensland Urban Utilities' design team to do the required design work for connecting into the district's network or employ an engineering firm. Also, developers can use the design service for completing the design of the water and sewer networks within a development.

Private plumbing work is when a customer requires work done on the water and sewer pipes on privately owned property. This work is open to any licensed plumber.

A review of Queensland Urban Utilities' services will be conducted prior to next year's submission to assess the existence and potential for competition in the supply of each service.

5.15 ESTABLISHMENT COSTS

In May 2007, the Queensland Water Commission released the *Urban Water Supply Arrangements Report*. Following this report it was proposed that a single distribution and three retail entities would be established to manage the distribution and retail supply of water and wastewater services. The Council of Mayors (SEQ) Water Reform Program and an Interim Distribution Entity were set up to manage the establishment under the initial reform model and consequently costs were incurred primarily in the areas of due diligence, consulting, program management expenses and establishment of a head office and executive management team.

Subsequent to this initial reform model, the Deputy Premier announced the new (current) model which resulted in the establishment of Queensland Urban Utilities and the other two distributor-retailer authorities. The costs incurred by Council of Mayor's SEQ Water Reform Program, the Interim Distribution Entity, councils and by the new water entities in establishing the distributor-retailer authorities under the water reform models (initial and current) are able to be carried forward as part of the regulatory asset base provided they meet eligible purpose criteria and verification requirements.

The cost of establishing Queensland Urban Utilities consists of four categories of cost.

1. Share of cost of Council of Mayor's SEQ Water Reform Program and Interim Distribution Entity.
2. Cost of establishing the Retail Entities under the initial reform model.
3. Cost of establishing the Central SEQ Distribution-Retailer Authority under the revised model.
4. Council transaction costs.

The Queensland Water Commission (QWC) has commissioned Ernst and Young (EY) to provide advice on the criteria. EY have provided a draft report to QWC for their consideration, however QWC have not yet provided advice back to the new entities on the final criteria and verification requirements. Given this guidance was not available we have used our estimate of the establishment costs as provided to the QWC. This *QCA Data Template* does not specifically cater for the addition of establishment costs into the 1 July 2010 opening RAB so these costs have been input into the capital expenditure for the 2009/10 financial year.

6. OUR INFRASTRUCTURE NETWORK

Queensland Urban Utilities' water and wastewater infrastructure networks service the cities and townships of the following council districts – Brisbane, Ipswich, Lockyer Valley, Scenic Rim and Somerset.

6.1 SUMMARY OF INFRASTRUCTURE ASSETS MANAGED

Queensland Urban Utilities' assets as of 1 July 2010 are summarised in the following table.

Table 9 Summary of Queensland Urban Utilities' existing assets

Physical Assets	Brisbane City	Ipswich City	Lockyer Valley Region	Scenic Rim Region	Somerset Region	Total
Water reservoirs	42	29	16	19	9	115
Water pump stations	18	17	9	4	13	61
Water boosters	86	13	8	1	0	108
Water supply network (km)	6368	1536	431	300	207	8842
Wastewater network (km)	6842	1388	77	150	80	8537
Wastewater pump stations	206	61	25	21	15	328
Water reclamation plants	9	4	4	6	5	28

6.2 THE DISTRICTS

The following table shows the cities and townships supplied by the water supply and sewerage networks for each of the five districts.

Table 10 Cities and townships serviced by Queensland Urban Utilities

Region	Wastewater network	Water supply network
Brisbane	Brisbane	Brisbane
Ipswich	Ipswich, Rosewood	Ipswich, Rosewood, Amberley, Grandchester and Ripley
Lockyer Valley	Forest Hill, Gatton, Helidon and Laidley	Forest Hill, Gatton, Grantham, Helidon, Laidley, Regency Downs, Kensington Grove and Withcott
Scenic Rim	Aratula, Beaudesert, Boonah, Canungra, Kalbar, Kooralbyn	Aratula, Beaudesert, Boonah, Canungra, Harrisville, Kalbar, Kooralbyn, Mt Alford, Peak Crossing, Rathdowney and Warill View
Somerset	Esk, Fernvale, Kilcoy, Lowood and Toogoolawah	Esk, Fernvale, Jimna, Kilcoy, Linville, Lowood/ Minden, Moore, Somerset Dam and Toogoolawah

6.3 WATER SUPPLY NETWORK

6.3.1 OVERVIEW

The water supply network is predominately concentrated in the centre of the amalgamated region, extending west from Brisbane through to Ipswich and the Lockyer Valley. Brisbane and Ipswich contribute approximately 89% of the total water supply network, with Lockyer Valley, Scenic Rim and Somerset contributing the remaining 11%.

At present the water supply network links the dams, water storage facilities and trunk and reticulation mains within the five council districts with minimal interface between districts.

The water supply network is included in Annex 5.

6.3.2 SOUTH EAST QUEENSLAND WATER GRID

Potable water is supplied to Queensland Urban Utilities from the South East Queensland water grid. Since July 2008 the grid has been operated by the following Queensland Government entities.

- Seqwater – owns and operates the raw water harvesting facilities (all major dams and bore fields around South East Queensland) and the water treatment plants, including clearwater storages.
- WaterSecure – supplies water from the Gold Coast Desalination plant and the Western Corridor Recycled Water Scheme to the water grid, power stations and Wivenhoe Dam.
- LinkWater – owns and operates the regional bulk water transportation system, including major trunk mains, pumping stations and bulk water reservoirs.
- SEQ Water Grid Manager – oversees the management of the water grid operations, purchasing bulk water and selling to local government-owned distribution and retail businesses.

6.3.3 WATER SUPPLY NETWORK – BRISBANE DISTRICT

Brisbane sources its water from the Somerset, Wivenhoe, North Pine and Enoggera Dams in conjunction with several small aquifer water treatment plants. Water is sourced from these dams and treated at the three state-owned water treatment plants – North Pine Water Treatment Plant (NPWTP), Mt Crosby Water Treatment Plant (MCWTP) and Enoggera Water Treatment Plant (EWTP). The treated water is then distributed to 38 water reservoirs in Brisbane via trunk mains, operated by LinkWater and Queensland Urban Utilities.

There are 25 reservoir zones supplying potable water throughout the 188 suburbs of Brisbane via approximately 300 km of trunk mains and approximately 6000 km of reticulation mains. Wellers Hill and Green Hill are two of the largest water supply zones in Brisbane distributing water to Brisbane's residential and industrial customers. Part of Brisbane's trunk network also transports water to Allconnex.

Due to the recent drought and general water scarcity, 30 'pressure managed area' zones have been introduced around Brisbane to regulate the pressure of low-level areas in Brisbane in order to reduce water loss within the system.

6.3.4 WATER SUPPLY NETWORK – IPSWICH DISTRICT

The Ipswich district sources its water from Wivenhoe and Somerset Dam storages on the Brisbane River. This water flows down the Brisbane River to the Mt Crosby Water Treatment Plant (MCWTP) where it is treated to drinking water standard. The treated water is then distributed to 27 water reservoirs and supplied via 1536 km of water mains to its customers.

6.3.5 WATER SUPPLY NETWORK – LOCKYER VALLEY DISTRICT

The Lockyer Valley district sources its water from the Wivenhoe Dam for distribution to the towns of Gatton, Grantham, Helidon and Withcott. The water is treated at a water treatment plant located in Lowood and supplied to the Gatton Shire at the eastern boundary of the shire. From there the water is distributed via pump stations and reservoirs through to Withcott. Water bypassing Gatton is pumped to either the Helidon Reservoir or Postman's Ride Reservoir. Helidon Reservoir distributes water to the towns of Helidon and Grantham. Postman's Ride Reservoir delivers water to a few properties in Postman's Ridge and will also be the supply for a proposed subdivision at Murphy's Creek.

6.3.6 WATER SUPPLY NETWORK – SCENIC RIM DISTRICT

The Scenic Rim region was established in 2008 with the amalgamation of the Boonah and Beaudesert Shires and the rural townships of Harrisville and Peak Crossing (previously in Ipswich local government area).

The region contains two dams, Lake Moogerah and Lake Maroon with construction of a third, Wyaralong Dam, expected to be completed in 2011. Flow is released from these dams to various creek and river systems, from which the region draws its water.

The water supply network provides two types of service – 'on demand' and 'constant flow'. On demand is the supply of treated water at full pressure to residential, commercial and industrial properties. Constant flow is the supply of treated water at a controlled rate of eight litres per minute to rural and residential properties.

A summary of the water supply schemes within the district is presented in Table 11.

Table 11 Scenic Rim water supply schemes

Scheme	Water Source
Boonah	Reynolds Creek Intake
Warrill View	Commercial allocation from Ipswich City Council
Beaudesert	Albert River and Logan River
Canungra	Canungra Creek
Kooralbyn	Logan River
Rathdowney	Logan River

6.3.7 WATER SUPPLY NETWORK – SOMERSET DISTRICT

The Somerset district sources the majority of its raw water from Wivenhoe Dam, Somerset Dam and the Brisbane River. The water supply schemes are independent operations servicing their relatively small communities. The distance between the townships mean there are minimal integration opportunities.

A summary of the water supply schemes within the district is presented in Table 12.

Table 12 Somerset water supply schemes

Scheme	Water Source
Linville	Borehole
Town of Kilcoy	Kilcoy Creek (preferred), bores and Lake Somerset
Town of Jimna	Jimna Creek
Lowood (includes Tarampa/ Minden)	Bulk water pipeline from Lowood
Esk	Wivenhoe Dam
Fernvale	Bulk water pipeline from Lowood
Toogoolawah	Esk Water Treatment Plant
Somerset Dam	Somerset Dam

6.4 WASTEWATER NETWORKS

6.4.1 OVERVIEW

The wastewater network is predominately concentrated in Brisbane and in the northeast region of Ipswich. Brisbane contributes approximately 80% of the wastewater network and Ipswich approximately 16%. The remaining 4% of the wastewater network is in the Lockyer Valley, Scenic Rim and Somerset regions.

The wastewater network consists of an array of gravity and rising mains transporting sewage from customers to WRPs for waste treatment, disposal and water reuse. With the exception of Carole Park Sewage Treatment and Moreton Bay Regional Council (Pine Rivers Sewage Transfer), there is currently minimal interaction between the five districts' sewerage networks. The main interaction between the districts is the Western Corridor Pipeline Scheme. Brisbane and Ipswich currently supply recycled water to the pipeline and there may be possibilities in the future for contributions from Lockyer Valley, Somerset and Scenic Rim.

The Sewerage Network is detailed in Annex 6.

6.4.2 WASTEWATER NETWORK – BRISBANE DISTRICT

Brisbane's wastewater network comprises eight WRPs servicing seven catchments. The network contains approximately 7000 km of sewer mains, with approximately 200 km of these being rising mains.

The three major Brisbane WRPs are located at Luggage Point, Oxley and Gibson Island, with Luggage Point servicing approximately 60% of Brisbane's total wastewater.

Table 13 shows which WRP services each catchment, the capacity of the plant and the year it was commissioned.

Table 13 Brisbane's water reclamation plants

Catchment	Water Reclamation Plant (WRP)	WRP capacity (EP)	Year commissioned
S1	Luggage Point	850,000	1975
S2	Fairfield	12,500	1966
	Oxley	270,000	1975
	Rocks Riverside	Sewer mining plant	2003
S3	Gibson Island	180,000	1989
S4	Wynnum	37,500	1965
S5	Sandgate	104,000	1966
S6	Wacol	35,000	1991
S7	Karana Downs	2500	1980

Brisbane's largest pumping station is located Eagle Farm. It pumps sewage through 11 km of rising mains, from the S1 catchment to the Luggage Point WRP. Sewage is transferred to the Eagle Farm Pump Station through three main sewer lines – the main sewer through Brisbane City, the North Kedron Brook sewer and the Norman Creek sewer. Other major sewerage infrastructure in the Brisbane area includes the 2.4 km S1 Interceptor from North Quay to Hamilton, and the Bulimba Creek sewer that transports sewage from the S3 catchment to the Gibson Island WRP.

6.4.3 WASTEWATER NETWORK – IPSWICH DISTRICT

The wastewater network in Ipswich services the three major catchments of Bundamba, Goodna and Carole Park and the minor catchment of Rosewood. These catchments are serviced by four WRPs – Bundamba, Goodna, Rosewood and Carole Park Sewage Treatment Centres. Amberley is serviced by a WRP owned and operated by the RAAF. Areas of the city that are not serviced by the sewerage network have on-site treatment systems.

Table 14 gives an overview of the catchments, their associated WRPs, their capacity and the year the plant was commissioned.

Table 14 Scenic Rim water reclamation plants

Catchment	WRP	WRP capacity (EP)	Year commissioned
Bundamba and Tivoli	Bundamba	100,000	1982
Goodna	Goodna	55,000	1971
Carole Park	Carole Park	22,000	1973
Rosewood	Rosewood	2300	1960

6.4.4 WASTEWATER NETWORK – LOCKYER VALLEY DISTRICT

The Lockyer Valley district has sewerage reticulation in the towns of Gatton, Helidon, Laidley and Forest Hill that feeds into four separate WRPs. There are 21 pump stations in total – 100 km of sewer gravity mains and 19 km of sewer rising mains.

Table 15 gives an overview of the catchments, their associated WRPs, their capacity and the year the plant was commissioned.

Table 15 Lockyer Valley water reclamation plants

Catchment	WRP	WRP capacity (EP)	Year commissioned
Gatton	Gatton	6800	1959
Helidon	Helidon	700	1998
Laidley	Laidley	6800	1968
Forest Hill	Forest Hill	700	1966

6.4.5 WASTEWATER NETWORK – SCENIC RIM DISTRICT

The Boonah district consists of three gravity wastewater schemes (Aratula, Boonah and Kalbar), each serviced by a WRP. Boonah is the only scheme with pump stations – seven in total. There are other smaller urban areas not connected to the wastewater network and treatment scheme as it is not economically feasible. These properties have on-site traditional septic systems and aerated sewage treatment systems.

The Beaudesert district consists of three gravity wastewater schemes (Beaudesert, Canungra and Kooralbyn), each serviced by a WRP. There are 12 pump stations in total across the three schemes.

Table 16 gives an overview of the catchments, their associated WRP, their capacity and the year the plant was commissioned.

Table 16 Scenic Rim water reclamation plants

Catchment	WRP	WRP capacity (EP)	Year commissioned
Aratula	Aratula	250	1988
Boonah	Boonah	3000	1967
Kalbar	Kalbar	700	1971
Beaudesert	BTST1	8000	1965
Canungra	CNST1	850	1976
Kooralbyn	KRST1	2000	1979

6.4.6 WASTEWATER NETWORK – SOMERSET DISTRICT

The Somerset district provides sewerage services to Esk, Lowood, Toogoolawah, Fernvale and Kilcoy. The treatment process at Esk and Lowood are trickling filters, while Toogoolawah utilises a maturation pond with a constructed wetland. At Fernvale, only a small population of the town is connected to the current scheme.

The Kilcoy WRP provides a 'secondary' level of treatment. The process incorporates primary sedimentation, trickling filters, secondary sedimentation, chlorination and sludge digestion and drying.

Other settlements within the district are serviced by septic systems.

Table 17 gives an overview of the catchments, their associated WRPs, their capacity and the year the plant was commissioned.

Table 17 Somerset water reclamation plants

Catchment	WRP	WRP capacity (EP)	Year commissioned
Esk	Esk	1300	1977
Toogoolawah	Toogoolawah	1300	1972
Lowood	Lowood	1200	1974
Fernvale	Fernvale	400	1992
Kilcoy	Kilcoy STP	2100	1980

6.5 RECYCLED WATER (NON-POTABLE)

6.5.1 BRISBANE DISTRICT

The Brisbane district has approximately 13.5 km of recycled water mains and five recycled water filling stations supplying Class A recycled to approved water carriers for non-residential use. The five tanker filling facilities are:

- Luggage Point Water Reclamation Plant (LPWRP)
- Sandgate Water Reclamation Plant (SWRP)
- Oxley Water Reclamation Plant (OWRP)
- Wacol Water Reclamation Plant and (WWRP)
- Gibson Island Water Reclamation Plant (GWRP).

LPWRP also directly supplies recycled water to British Petroleum Refinery at Bulwer Island and the WWRP Plant supplies Caltex Lytton Refinery. LPWRP, GWRP, WWRP and OWRP also supply recycled water to the Western Corridor Recycled Water Scheme. Additionally, there are a number of golf courses and parks that are supplied with recycled water.

6.5.2 IPSWICH DISTRICT

The Ipswich district contributes the majority of its treated water flow from Bundamba and Goodna Sewage Treatment Plants to the Western Corridor Recycled Water Scheme.

Recycled water is also supplied to approved water carriers from tanker filling stations for non-residential use. These tanker filling stations are:

- Bundamba Wastewater Centre
- Rosewood Wastewater Centre.

6.5.3 LOCKYER VALLEY DISTRICT

The Lockyer Valley district has implemented a project to enable beneficial reuse of all water from the Gatton WRP. This will result in no water flow into Lockyer Creek except in abnormal wet weather situations. Users of this water will be responsible for the following.

- Transporting the water to their property. This will include the initial capital cost of infrastructure i.e. pumps, switchboards, pump station, water meters, telemetry and pipelines.
- Ongoing operation, maintenance and depreciation costs of pump station, pipeline and ancillary equipment.
- Delivery of the water.
- Provision of plant and equipment used for the distribution of the water within the user's property.

6.5.4 SCENIC RIM DISTRICT

The Scenic Rim district currently supplies recycled water from the Beaudesert Sewage Treatment Plant (STP) to the racecourse and golf club in Beaudesert. This treatment plant also supplies recycled water through a dedicated 150 mm diameter pipeline to a storage dam on Tim Deeran's property on the western side of Bromelton House Road. The pipeline is initially able to supply up to one megalitre per day, but when further modifications are made to the pumping system and the pipeline is extended, in excess of two megalitres per day of recycled water will be available. Other schemes in the district include supplying recycled water from Boonah WRP to two farmers. The Kalbar WRP has one dedicated customer and occasionally supplies the Kooralbyn Resort.

6.5.5 SOMERSET DISTRICT

The Esk WRP currently supplies recycled water to Esk Golf Course and Toogoolawah WRP supplies recycled water to Toogoolawah Golf Course. Effluent re-use also occurs on an ad hoc basis to provide water to council parks and gardens. The district continues to investigate opportunities for the reuse of treated effluent.

7. INFRASTRUCTURE BASED EXPENDITURE

Infrastructure based expenditure includes both capital and expensed maintenance costs. Queensland Urban Utilities ensures that this investment satisfies the following objectives to:

- meet statutory requirements of planning acts
- ensure customers receive water supply and sewerage services within agreed standards of service for quality, quantity and reliability
- meet forecast growth requirements
- apply a triple bottom line approach in determining future investment profiles
- supply the required infrastructure in the most efficient way
- prioritise so that limited capital is directed towards those initiatives that provide maximum benefit to the customer.

Previously it was common practice to split capital expenditure into two main drivers, these being:

- replacement – maintaining asset performance through renewal or replacement
- enhancement – improvement of service capacity/ performance of assets.

Queensland Urban Utilities' has commenced reclassifying its assigning capital expenditure using the QCAs preferred classifications (drivers).

Queensland Urban Utilities' capital program will be further rationalised and optimised as Queensland Urban Utilities is fully established.

Queensland Urban Utilities has also established a 30-year program of capital investment.

The 30-year forecast capital program is composed of projects sourced from:

- long-term infrastructure planning
- asset rehabilitation and replacement requirements
- predicted technological change.

Queensland Urban Utilities is presently drafting a *Water Netserv Plan*, which provides an overview of Queensland Urban Utilities' infrastructure and service plan. The *Water Netserv Plan* supports and reflects the regional planning conducted by the Queensland Government and the local planning of the five local government areas that make up Queensland Urban Utilities' operational area.

Queensland Urban Utilities is required under legislation to have its *Water Netserv Plan* in place by 1 July 2013. Completion of the *Water Netserv Plan* will see it replace several current asset management regulatory tools, combined under the Total Management Plans. The majority of these Total Management Plans are anticipated to expire on 31 December 2012. Queensland Urban Utilities is working to finalise its *Water Netserv Plan* at the earliest opportunity.

7.1 ASSET MANAGEMENT APPROACH

The asset base that Queensland Urban Utilities manages varies from civil infrastructure with a predicted life of 100-plus years through to mechanical and electrical equipment with a design life in some cases of less than five years. This includes tanks, wet wells, pipe work, pumps, variable speed drives, and instrumentation and control systems.

As different service standards, legislation and predicted life are applied to different groupings of assets. The assets are classified into asset classes to maintain a common strategic approach to assets of similar cohorts.

The high-level framework applied to Queensland Urban Utilities assets to manage the asset classes are categorised into the following five main categories.

7.1.1 ASSET CREATION AND ENHANCEMENT

This approach identifies assets that require future enhancement due to a requirement to increase capacity or quality of the final product/discharge. Governance and identification of works is through the master planning and feasibility process with the execution of works being delivered through the Major Projects and Commercial Services Unit.

7.1.2 ASSET OPERATIONS

This approach is the organisation's day-to-day operations of the existing assets to deliver the required levels of service. The governance for this function is detailed in operating parameters and procedures. It is delivered by the Service Delivery Unit through the SCADA and works management system.

7.1.3 ASSET MAINTENANCE

This approach is the organisation's ongoing maintenance of the existing assets to deliver the required levels of service. The governance for this function is detailed in operating parameters, procedures and maintenance methodologies. It is delivered by the Service Delivery Unit through the SCADA and works management system.

7.1.4 ASSET REPLACEMENT/REHABILITATION

This approach identifies assets that are not fit for purpose, identifies the solutions and prioritises the works into the capital rolling programs for execution. Works are primarily identified from structured asset condition monitoring, performance and condition measurement identified in the field. A rolling program is a program of works to efficiently deliver a finite number of similar minor capital projects, usually grouped by asset type. The governance for this function is located in the individual rolling program business rules. The Major Projects and Commercial Services Unit delivers these works.

7.1.5 ASSET DISPOSAL

This approach identifies assets that are no longer of benefit to the organisation, removes them from service, rehabilitates the physical site and reallocates the land back to the relative authority when required. Governance and identification of works is through the master planning and feasibility process. The Major Projects and Commercial Services Unit delivers these works.

7.2 CAPITAL PLANNING

In developing its infrastructure strategies, Queensland Urban Utilities considers a variety of statutory, industry, customer, regional and other influences.

7.2.1 STATUTORY PROVISIONS

The *Water Act 2000* sets out provisions for the management of water resources in Queensland.

The *Water Supply (Safety and Reliability) Act 2008* provides for a regulatory framework for providing water and sewerage services in Queensland, including functions and powers of service providers. It requires service providers have a *Strategic Asset Management Plan (SAMP)*, *System Leakage Management Plan (SLMP)*, *Drinking Water Quality Management Plan (DWQMP)* and Customer Service Standards.

The *Environmental Protection Act 1994* requires water service providers to ensure that development is ecologically sustainable. The *Environmental Protection (Water) Policy 2009* specifically requires local governments to develop environmental plans on a range of issues including water conservation, trade waste and sewerage management.

Sustainable Planning Act 2009 requires water authorities to develop master plans for their systems, capital works schedules for future infrastructure and equitable funding mechanisms in the form of infrastructure charges (priority infrastructure plans and infrastructure charges schedules).

The *South East Queensland Water (Restructuring) Act 2007* enabled the formation of the bulk water supply authorities and the water grid manager and sets out their roles, responsibilities and powers.

The *South East Queensland Water (Distribution and Retail Restructuring) Act 2009* enabled the formation of distributor-retailers (of which Queensland Urban Utilities is one) and sets out their roles, responsibilities and powers.

The *South East Queensland Water (Distribution and Retail Restructuring) Act 2009* and *Other Legislation Amendment Act 2010*, amended several of the above-mentioned Acts. The amendments further clarified the roles, responsibilities and powers of Distributor-Retailers set out in the *South East Queensland Water (Distribution and Retail Restructuring) Act 2009* and made consequential amendments to other acts to ensure consistency. In particular, the *South East Queensland Water (Distribution and Retail Restructuring) Act 2009* sets out transitional arrangements and requires distributor-retailers to produce a plan (a *Water Netserv Plan*) about their water and wastewater networks and also provide their water and wastewater activities. The *Water Netserv Plan* must have regard to planning documents including in the *South East Queensland Regional Plan 2009-2031* and the planning assumptions made by shareholding councils for Queensland Urban Utilities' operating area. Under transitional arrangements, the *South East Queensland Water (Distribution and Retail Restructuring) Act 2009* transfers SAMPs and SLMPs developed by its five shareholding councils to Queensland Urban Utilities, until such time as the new business develops an endorsed *Water Netserv Plan*.

7.2.2 INDUSTRY TRENDS

Commercialisation within the water industry has placed greater emphasis on the need for water service providers to maximise utilisation of their existing infrastructure, refine planning for new infrastructure and ensure that the customers receive value for money in making capital investment decisions.

New technologies, associated costs, capability and reliability are continuously improving and providing new options for improvement of water service delivery.

7.2.3 COMMUNITY CONSIDERATIONS

The general community's expectations are that the water service providers will continue to meet (and possibly improve) their customer outcomes over time. Planning is a key process for the water service provider in meeting this expectation.

The application of infrastructure charges has led the development community to take an increased interest in the efficiency and effectiveness with which trunk infrastructure is provided to meet the growing needs of the region.

7.2.4 REGIONAL CONSIDERATIONS

South East Queensland is Australia's fastest growing metropolitan region, covering 22,890 square kilometres. It stretches 240 kms from Noosa in the north to the Queensland-New South Wales border in the south, and 160 kilometres west to Toowoomba. From 2006 to 2031, its population is expected to grow from 2.86 million to 4.4 million people. An estimated 754,000 additional dwellings will be required to cater for this growth. The estimated resident population at June 2009 was 3.1 million.

The population in the central area serviced by Queensland Urban Utilities is expected to increase from 1.31 million in 2009 to 1.82 million in 2031, requiring approximately 270,000 additional dwellings. As a key provider of water services within the region, Queensland Urban Utilities needs to ensure that its planning processes are sufficient to meet the challenges generated by this rapid growth. In the regional context, Queensland Urban Utilities will need to:

- ensure its planning is consistent with the *South East Queensland Regional Water Supply Strategy*, identifying supply constraints and demand horizons for regional water resource and per capita demand targets
- give due consideration to the *Healthy Waterways Strategy* – a Queensland Government and South East Queensland councils initiative to protect and enhance waterways, and deliver the *South East Queensland Regional Water Quality Management Strategy*
- liaise and coordinate with the Grid Manager and drinking water and recycled water groups
- continue to participate in regional forums to ensure a coordinated response to water quality issues.

7.2.5 CUSTOMER SERVICE STANDARDS

The service standards define the overall performance targets that the organisation must manage its assets to meet. The operational, maintenance and rehabilitation requirements to meet these standards define the overall asset management strategy for the organisation.

7.2.6 POPULATION GROWTH

Population growth projections as highlighted under the demand section are a significant driver to the organisation. When combined with the design standards, they define the future capacity requirements of the system to meet the service standards in place.

Areas of major growth over the next five years include:

- Brisbane – Rochedale, Oxley, Fitzgibbon, Hamilton and Bowen Hills
- Ipswich – Springfield and Ebenezer
- Lockyer – Laidley, Plainland and west of Gatton
- Somerset – Fernvale and Lowood
- Scenic Rim – Bromelton, Canungra and Boonah.

7.2.7 PLANNING APPROACH

Queensland Urban Utilities' planning for water supply and sewerage transport and treatment infrastructure is approached on three levels.

1. System planning

System planning looks at the overall high-level strategy across the region for delivering integrated water services. Opportunities for improvements in the system configuration are identified and assessed (e.g. inter-catchment transfers to better balance treatment plant loads and capacities and defer plant upgrades, alterations to water supply service zones, integrated water management opportunities such as re-use schemes etc.). Factors considered as part of this high-level planning include:

- continuously challenging, and changing as necessary, adopted planning design criteria in light of changing customer usage profiles
- responding to industry trends including development of integrated water cycle management initiatives, increased environmental regulation and increases in customer expectations
- remaining abreast of the latest technological developments and their applicability to Queensland Urban Utilities
- continuing to meet the business benchmark key performance indicators for delivery for service outcomes, improvement of financial forecast and delivery of infrastructure.

2. Supply area/catchment-based master planning

Supply area/catchment-based master planning undertaken at the individual supply area/catchment scale in alignment with the broad system planning strategy adopted. This master planning identifies the need for, timing and costs of new infrastructure required to provide adequate system capacity to maintain service standards under projected growth in demands.

3. Integrated Water Management Plans

Integrated water management planning takes a holistic view of managing the urban water cycle in order to achieve more sustainable outcomes. It considers the linkages between the water supply, sewerage and stormwater systems and examines alternative servicing strategies that provide more efficient use of resources and reduced impacts on the environment. Examples of elements that might be considered in an integrated water management plan include demand management initiatives, rainwater harvesting, stormwater harvesting, wastewater recycling, sewer mining, groundwater use, smart sewer technology and water sensitive urban design.

Queensland Urban Utilities is undertaking integrated water management planning on three fronts.

1. Specific integrated water management plans – these are detailed studies that consider integrated water management options for specific areas. Integrated water management plans have been completed for:
    - Rochedale Urban Community
    - Lower Oxley Creek
    - Australia Trade Coast.
2. Broad scale integrated water management planning – this involves incorporating integrated water management options into network master plans on a broad scale to assess impacts on infrastructure requirements.
3. Assessment of alternative water management options – this involves carrying out studies that examine specific non-traditional servicing approaches and report on their costs, benefits, risks, appropriateness for various types of development, possible management regimes, funding options, legislative implications and barriers to implementation. Considerable work has been carried out on rainwater harvesting at the household scale, centralised wastewater reuse systems, smart sewer systems and low-pressure sewer systems.

7.2.8 FEASIBILITY, BUSINESS CASE AND PRELIMINARY DESIGN

Feasibility studies look at elements of infrastructure identified in the master plans as being required within the next three years.

Feasibility studies are the first step in ensuring capital expenditure meets the requirement of efficiency. Studies are undertaken to examine the options available in detail to determine the best solution for addressing the identified issue. This includes alternative solutions that may enable deferment of capital expenditure (e.g. non-asset solutions). The Multi-Criteria Options Evaluation (MCOE) technique is used to ensure a triple bottom line approach is used in determining the recommended solutions. The detailed planning provides high definition of infrastructure requirements and accurate cost estimates.

Preliminary design of the preferred option is undertaken as an integral part of the feasibility report. This means that project designers have input into the feasibility process to ensure that the preferred option is constructed and that any issues that may affect delivery such as survey, environmental studies, land issues, traffic issues are addressed. By incorporating preliminary design into the feasibility process, this has ensured a seamless transition between the planning and project delivery processes.

Project estimates are refined throughout the project planning process. Before the feasibility process commences, project estimates in the capital program are based on master planning estimates constructed through the use of agreed unit rates. During the feasibility report process various options are costed for competitive processes. Using project cost estimates software for options analysis, an estimate accuracy of +35%/-25% is typical. Once a solution is identified a more accurate estimate is prepared. A quantity surveyor based on the preliminary design of the recommended option typically does this. Estimate accuracy is typically considered to be +25%/ -15% of this stage. Following detailed design the estimate is referred still further for input into the budget process.

7.3 CAPITAL INVESTMENT PROGRAM

The outcomes of the above planning and asset management process are contained in the development of a 30-year capital investment plan, which details the proposed investment in infrastructure on a year-by-year basis. The program includes infrastructure items identified in the master plans, as well as items identified through the asset evaluation and renewal activities and operational issues that require asset solutions.

Items in the master plans that developers are expected to provide through infrastructure agreements are identified. These are retained in the capital investment plan for information but do not form part of Queensland Urban Utilities' budget provision (since they are funded by developers with offsets against infrastructure contributions). The remaining items to be provided by Queensland Urban Utilities are prioritised and timings are adjusted in order to achieve a more balanced expenditure profile.

Adjustment and rationalisation of the 30-year investment profile is conducted on a regular basis to ensure that it remains an accurate current reflection of required future capital investment.

A five-year 'slice' of the 30-year capital investment plan is taken forward for detailed budget deliberations on an annual basis.

7.4 ANNUAL PRIORITISATION

In order to ensure that limited annual capital funds are directed to the highest priority works, a capital prioritisation model is used to prioritise works.

The capital prioritisation model is included in Annex 7.

The risks associated with non-funding of individual line items are calculated and the associated potential adverse impacts identified. In sorting the list of projects, preference is given to those projects already contractually committed or ongoing. Where possible, potential fallback funding positions are identified along with the associated impacts of adopting them.

The 2010/11 proposed capital program was successfully prioritised and this resulted in the limited capital funding being directed to the projects that will provide the most benefit for our customers.

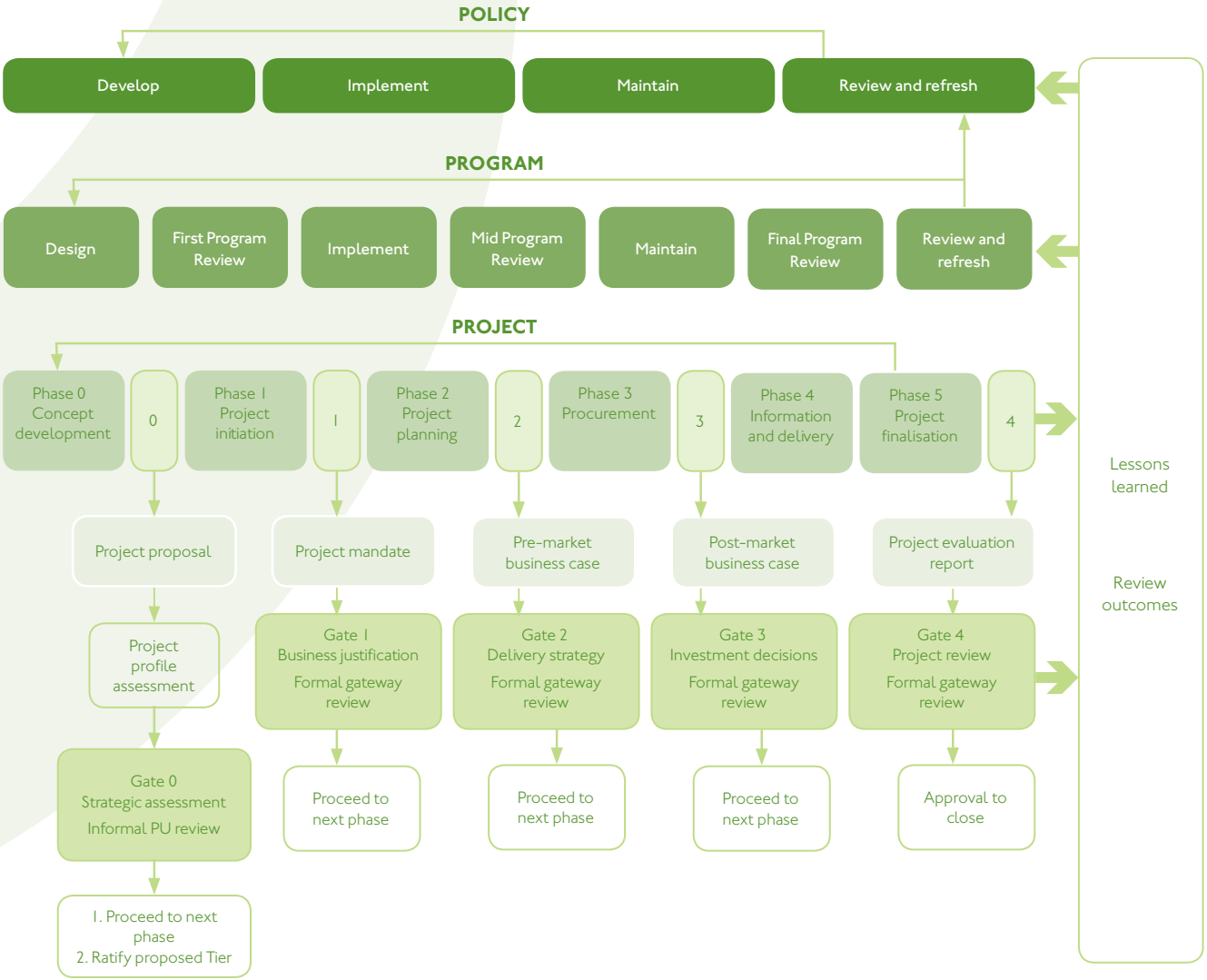
7.5 INDEPENDENT REVIEW

In order to ensure that proposed 2010/11 major projects for throughout the region had been subjected to a suitable amount of planning rigour, independent reviews of these projects by a third party was undertaken. The review evaluated projects on a range of criteria including design standards, growth projections, project justification, project deliverability and cost. A regulatory assessment was also carried out for some of the projects. These reviews have led to further rationalisation of future capital works. It is anticipated that a gateway review process using the PMBOK methodology will be implemented for future year capital programs.

7.5.1 GATEWAY REVIEW PROGRAM

Queensland Urban Utilities intends to use the Gateway Review program to provide independent support to projects by having peers examine them at critical stages in their lifecycle.

Figure 5 Gateway review process



The Gateway Review program supports project owners to achieve Queensland Urban Utilities' business aims by helping them to ensure:

- the best available skills and experience are used on the project
- all stakeholders completely understand the project status and issues involved
- achievement of realistic time and cost targets for the project
- provision of guidance and advice to project teams from independent fellow practitioners
- assurance that effective project governance and project management arrangements are in place
- effective risk management practices are being used
- alignment of project objectives to the strategic deliverables
- improvement of skills and knowledge across the organisation through staff participation in reviews
- lessons learned are effectively captured and used to improve the success of other projects.

The Gateway Review program is an important tool for Queensland Urban Utilities to ensure that its projects are delivered in a timely and cost effective manner.

7.6 CAPITAL EXPENDITURE – ASSET REPLACEMENT/REHABILITATION

Queensland Urban Utilities' capital asset replacement/rehabilitation program focuses on assets that are in poor condition, unable to be maintained and/or are under performing. These are assets approaching the end of their lives, but also include assets that show sign of early failure.

Appropriate asset replacement/rehabilitation capital expenditure will maintain and in some cases improve the performance of Queensland Urban Utilities' asset base. This in turn reduces the number of failures requiring escalation of corrective and responsive maintenance and so improves whole-of-life costing, reliability, customer levels of service and public safety.

The capital asset replacement/rehabilitation program is supported by individual asset class rolling programs governed by rules as stipulated in the associated business cases. The rules governing the inclusion of works will be classified and briefly detailed into the three sections to follow.

7.6.1 PERFORMANCE

This type of capital expenditure relates to an asset that is not fit for purpose due to poor performance. This method is primarily used upon assets where access and/or other constraints prohibit the implementation of a suitable condition assessment program. Assets affected include retail water mains, bio-reactor diffuser membranes, advanced water treatment membranes and pumps fleet.

The works are identified through operational monitoring and historical failure analysis of the asset base.

7.6.2 OBSOLESCENCE/CONDITION BASE

This type of capital expenditure relates to an asset's life cycle and seeks to avoid the escalation of corrective and responsive maintenance expenditure by providing for the equipment to be replaced and refurbished when the asset is not fit for purpose due to:

- defects being identified that have or will result in a failure of the asset
- the asset being beyond its intended life and is no longer supported in the context of operations and maintenance activities.

This expenditure is identified and driven through various condition inspection programs such as operational information and inspections, CCTV inspections, structural audits and facility condition assessments.

7.6.3 CONDITION PRIORITISATION OF WORKS

Queensland Urban Utilities employs a condition rating or similar for all of its assets. This rating will identify works required as part of this program. The drivers for the condition rating are failure rates, characteristics, risk (such as safety, environment, customer levels of service and financial), unserviceability, obsolescence, replacement of whole assets rather than component parts, bulk replacement strategies, unavailability of spare parts, premature ageing and performance.

High priority works have direct impact upon safety, environment, customer service levels service and financial obligations. The programs are continuously monitored and reprioritised if required to accommodate unforseen emergent works that arise.

The 2010/11 replacement program identified comprises the following significant project/programs:

Table 18 2010/11 Replacement program

Project	Proposed 2010/11 investment	Total project cost
Brisbane		
Trunk sewers renewal program	$8m	Rolling program*
Burst main renewal program	$6.8m	Rolling program
Water supply system service capacity improvement	$3.7m	Rolling program
Sewerage pump station reliability improvement – Stage 2	$3.4m	Rolling program
Water meter renewal program	$3.6m	Rolling program
Luggage point WRP – wet weather relief overflow	$2.1m	$4.7m
Water reclamation plant minor renewal program	$3.6m	Rolling program
Nudgee Beach WRP replacement	$4.0m	$7.2m
Gowan Road pump station rising main replacement	$3.7m	$5.2m
Wacol WRP – inlet screens replacement	$2.9m	$3.2m
Ipswich		
Sewerage pump stations renewal program	$5m	Rolling program
Sewerage reticulation mains renewal program	$2.5m	Rolling program
East and Brisbane Street water main renewal	$2.3m	$2.3m
Water reticulation mains renewal program	$1.6m	Rolling program
Water trunk main renewal program	$1.7m	Rolling program
Project	**Proposed 2010/11 investment**	**Total project cost**
Lockyer Valley		
Wastewater reticulation mains renewal program	$0.3m	Rolling program
Scenic Rim		
Wastewater pump station renewal program	$0.3m	Rolling program
Sewer rising main replacement	$0.3m	Rolling program
Water main replacements – Boonah	$0.2m	Rolling program
Somerset		
Water reticulation mains renewal program	$0.3m	Rolling program

* N.B. A rolling program is a program of works to efficiently deliver a finite number of similar minor capital projects, usually grouped by asset class.

7.7 CAPITAL EXPENDITURE – GROWTH, COMPLIANCE AND IMPROVEMENTS PROGRAM (ENHANCED)

The proposed 2010/11 program identified to date comprises the following major enhancement projects.

Table 19 Growth and Compliance Program

Project	Proposed 2010/11 investment	Total project cost
Brisbane		
Bulimba Creek trunk sewer upgrade – Padstow Road to Coora Street	$13m	$52.4m
Woolloongabba sewer catchment augmentation – Stage 2	$9m	$51.4m
Auchenflower branch sewer upgrade	$7.5m	$16.3m
Cubberla creek main sewer upgrade	$5.4m	$5.4m
Bartleys Hill and Eildon Hill Reservoirs inlet improvements	$4.1m	$5.7m
Ipswich		
Goodna STP upgrade	$55.9m	$206.8m
Woogaroo Creek (Goodna) trunk sewer augmentation	$26.1m	$88m
Somerset		
Fernvale STP implementation	$5m	$18.6m
Lockyer Valley		
Eastern regional STP upgrade	$3m	$17.8m
Scenic Rim		
Canungra STP upgrade	$3.8m	$5m
Tullamore reservoir (Beaudesert) implementation	$0.5m	$0.6m

As can be observed, the majority of works across the region will be in the wastewater transportation and treatment assets.

7.7.1 COMPLIANCE

Meeting the asset management regulatory framework and other statutory requirements will continue to have a major impact on capital expenditure.

Expenditure in this area can occur where there is a high risk of non-compliance with existing requirements or as a result of a change in requirements. Recent examples of this are changes to the requirements for drinking water and recycled water testing and monitoring as a result of new state government legislation.

Queensland Urban Utilities is required to meet higher quality discharge limits imposed under Development Approval conditions for each treatment plant. The high quality release limits are imposed to protect the public health and the environmental health of our waterways. These requirements reflect the outcomes of the Healthy Waterways program where tighter discharge requirements to the regions waterways have been identified. As a result, major plant upgrades are being proposed for Goodna, Bundamba, Fernvale, Canungra and Laidley Wastewater Treatment Plants.

Maintaining high reliability sewage reticulation infrastructure is fundamental to protecting waterways and public health. The Strategy outlines commitments given by shareholding councils in relation to sewage overflow abatement. Queensland Urban Utilities is continuing the delivery of a $19 million five-year program to upgrade 200 sewage pump stations commenced by Brisbane City Council. This program initially involved a detailed Reliability Centred Maintenance study to identify the potential for equipment failure at pump stations. High reliability pump station control equipment and switchboards have since been rolled out to pump stations across the networks to mitigate the risk of dry weather overflows.

Under the *Water Supply (Safety and Reliability) Act 2008* certain aspects of the *Public Health Act 2005* and *Public Health Regulations 2005*, Queensland Urban Utilities is required to comply with a Mandatory Monitoring program. This program requires reporting of Queensland Urban Utilities' routine monitoring program, drinking water quality incidents and provision of quarterly drinking water quality reports until Queensland Urban Utilities has an approved *Drinking Water Quality Management Plan* (DWQMP). The DWQMP is required by 1 July 2011. The Queensland Water Commission and the

Water Grid Manager require that Queensland Urban Utilities follow Grid Contracts and Market Rules, develop and follow *Emergency Response Plans*, *Water Quality Monitoring Plans*, and the *Water Quality Management Plans* which mirror Grid Manager Plans.

7.8 PRIORITY INFRASTRUCTURE PLANS

Priority Infrastructure Plans (PIP) outline the necessary sequence of network augmentation required to maintain the nominated service standard as new development occurs and detail the developer contributions to be paid towards the provision of trunk infrastructure, based on fair apportionment principles according to asset usage. These plans are being developed individually by each of the five shareholding councils in Queensland Urban Utilities and include the water supply and sewerage networks. It is expected that the plans will be adopted and implemented in 2011, following council endorsement, Queensland Government interest checks and statutory exhibition.

In the interim, shareholding councils' Infrastructure Charges Planning Scheme Policies (PSP), which are based on a charging regime that is consistent with the proposed PIPs, are used to charge for new development. PSPs include water and sewer Headworks Contribution policies which were originally made in accordance with the *Local Government Planning and Environment Act 1990*. In the longer term, it is expected that Queensland Urban Utilities will be responsible for its own PIPs.

7.9 DEVELOPER CONSTRUCTED ASSETS

Developers are required to construct infrastructure that is necessary for their development to be connected to the water supply and/or sewerage networks. Necessary infrastructure includes:

- infrastructure that is required to extend the existing network to the development site
- infrastructure within the development site that is required to service the development
- reasonable and relevant infrastructure to augment the existing network that is required to ensure the network has sufficient capacity to cater for the development.

Infrastructure that is constructed by developers, and forms part of Queensland Urban Utilities' networks, is donated to Queensland Urban Utilities following acceptance that it has been constructed in accordance with Queensland Urban Utilities' standards.

The value of any infrastructure that is donated and is considered trunk infrastructure may be offset against infrastructure charges that are payable for the development in accordance with the shareholding council's infrastructure charging policy. Queensland Urban Utilities retains the right to negotiate all water and wastewater infrastructure agreements for trunk infrastructure. For example, if trunk infrastructure is supplied in lieu of payment of a charge (e.g. an offset) or exceeds the value of infrastructure charges payable for the development, Queensland Urban Utilities may enter into an infrastructure agreement with the developer, which sets out terms for reimbursement from Queensland Urban Utilities to the developer.

It is noted that all five shareholding councils are in different stages of adoption of the PIP framework.

8. REVIEW

8.1 CERTIFICATION BY DIRECTORS

DIRECTORS' RESPONSIBILITY STATEMENT

In the opinion of the Directors of Central SEQ Distributor-Retailer Authority trading as Queensland Urban Utilities:

(a) the price monitoring information returns set out in the attached *QCA Data Template* are drawn up so as to fairly represent in accordance with the requirements of the South East Queensland Water Industry Information Requirements issued by the Queensland Competition Authority, (Information Requirements):

  (i) information required by the Information Requirements;

  (ii) information on related party transactions required;

  (iii) information on third party transactions required by the Information Requirements; and

(b) the terms and definitions used in this statement accord with the definitions set out in the Information Requirements.

Signed in accordance with a resolution of the Directors

Jude Munro AO
Chair
27 August 2010

The following items have been deleted as they are not applicable

Statement	Reason for deletion
The results of each entity business segment for the current price monitoring information period ended [period end].	The first price monitoring period has not been completed.
Information concerning the state of affairs at [period end], of each deemed category.	The first price monitoring period has not been completed.
No related party transactions of the type described in the Information Requirement arose during the current price monitoring accounting period that require disclosure under the Information Requirements (to be deleted only if disclosure is confirmed above).	Disclosed in the price monitoring return.
No third party transactions of the type described in the Information Requirement occurred during the current price monitoring period that require disclosure under the Information Requirements (to be deleted only if disclosure is confirmed above.	Disclosed in the price monitoring return.

8.2 MINUTE EXTRACT

An extract of the Minutes of the Board Meeting resolving to sign the Directors Responsibility Statement is provided in Annex 8.

ANNEXES

ANNEX I: SUMMARY LIST OF CURRENT TARIFFS

2010/11 PRICE LIST – BRISBANE CITY

NON-RESIDENTIAL PROPERTIES – BRISBANE WATER AND SEWERAGE CHARGES

Effective 1 July 2010

Description	Volume Charge Tier	2010/11	Unit
Water Services			
Annual Water Access Charge		$162.96	pa
Annual Water Access Charge – Vacant land		$162.96	pa
Tier 1 Consumption	<=200 kL	$0.77	/kL
Tier 2 Consumption	201-300 kL	$0.88	/kL
Tier 3 Consumption	>300 kL	$1.29	/kL
State Government Bulk Water Charge	per kL	$1.52	/kL
Sewerage			
Sewerage Access Charge		$461.16	pa
Sewerage Access Charge – Reduced access		$171.60	pa
Pedestal Charges			
General (Other)	2-8 pedestals (each)	$490.08	pa
	9-12 pedestals (each)	$613.68	pa
	over 12 pedestals (each)	$754.80	pa
Multi-residential properties (non-community title scheme)	2-8 pedestals (each)	$405.96	pa
	9-12 pedestals (each)	$509.16	pa
	over 12 pedestals (each)	$627.24	pa
Retirement Villages, Child Care Centres, Convalescent Homes, Hospitals, Schools, Kindergartens, Community Protection Centres, Churches, Welfare Homes (excluding land used for the purpose of University or Tertiary education), Not-for-Profit Sporting and Community Organisations (excluding land used for a commercial purpose).	2-8 pedestals (each)	$191.40	pa
	9-12 pedestals (each)	$238.92	pa
	over 12 pedestals (each)	$294.60	pa
Major Sporting Stadiums owned by the Major Sports Facilities Authority	Pedestal/s (each)	$490.08	pa
Trade Waste			
Category A – Minimum charge		$340.32	pa
Category B		$1.27	/kL
Category C		$0.97	/kL
Category D			
Volume		$0.84	/kL
Suspended solids		$0.76	/kg
Biological oxygen demand (standard rate)		$0.82	/kg
Biological oxygen demand (discount rate)		$0.63	/kg
Nitrogen		$1.88	/kg
Phosphorus		$1.49	/kg
Sundry Charges			
Metered Standpipes			
Annual permit to use a standpipe (per customer)		$384.36	pa
Tier 1 Consumption	<=200 kL	$0.77	/kL
Tier 2 Consumption	201-300 kL	$0.88	/kL
Tier 3 Consumption	>300 kL	$1.29	/kL
State Government Bulk Water Charge	per kL	$1.52	/kL
Alternate Source Water			
Demineralised Water		$2.53	/kL
Demineralised Water Class A+		$2.67	/kL
Class A Water		$1.07	/kL

How to calculate the pricing

Charges for water used from 1 July 2010 are calculated on a tiered basis and applied depending on a property's total consumption.

(i) The tiered system applies different prices for the volumes used within each of three tiers (Tier 1, Tier 2 and Tier 3). Consumption falling within the lowest tier (Tier 1) is calculated by dividing the Tier 1 threshold (200 kL) by 365 and multiplying by the number of days in the bill period. Consumption falling with Tier 2 (300 kL) is then calculated on the same basis. Any residual consumption will fall within Tier 3, and be priced accordingly. The consumption calculation for each bill is separate to the subsequent consumption calculation for each subsequent bill, with no carry over of any unused portion of the thresholds from one bill to the next.

For more information contact Queensland Urban Utilities on 13 26 57.

Example: a commercial customer uses 95 kL of water in a 90-day water meter reading period.

Step 1 – Work out how many kilolitres apply in each tier:

Tier 1 Consumption – threshold is 200 kL divided by 365 days multiplied by 90 days = 49 kL
Tier 2 Consumption – threshold is 300 kL divided by 365 days multiplied by 90 days = 74 kL
Tier 3 Consumption – threshold is all consumption above 74 kL

Step 2 – Calculate the charges using the kilolitres that apply in each tier:

$0.77 for 49 kL $37.73
$0.88 for 25 kL (74 kL minus 49 kL) $22.00
$1.29 for 21 kL (95 kL minus 74 kL) $27.09
$1.52 for 95 kL (State Government Bulk Water charge) $144.40

Quarterly Water Access Charge $40.74

Total water charges $271.96

(ii) If the commencement of the financial year is within a reading period, the consumption shall be apportioned by the number of days in each financial year and the applicable charges and calculation methodology for that particular financial year will be applied.

(iii) The charges and respective consumption tiers contained in the Water and Sewerage Charges shall be calculated by reference to reading periods and may be adjusted accordingly by Queensland Urban Utilities to coincide with those reading periods.

(iv) The annual access for Sewerage and Pedestal Charge is applied on a quarterly basis by dividing the annual charge by four. The quarterly charge will appear as a separate line item on the bill and will be included in the total charges.

2010/11 PRICE LIST – BRISBANE CITY

RESIDENTIAL PROPERTIES – BRISBANE WATER AND SEWERAGE CHARGES

Effective 1 July 2010

Description	Volume Charge Tier	2010/11	Unit
Water Services			
Annual Water Access Charge		$162.96	pa
Annual Water Access Charge – Vacant land		$162.96	pa
Tier 1 Consumption	<=255 kL	$0.65	/kL
Tier 2 Consumption	256-310 kL	$0.69	/kL
Tier 3 Consumption	>310 kL	$1.23	/kL
State Government Bulk Water Charge	per kL	$1.52	/kL
Sewerage			
Annual Sewerage Access Charge		$461.16	pa
Annual Sewerage Access Charge – Reduced access		$171.60	pa

How to calculate the pricing

Charges for water used from 1 July 2010 are calculated on a tiered basis and applied depending on a property's total consumption.

(i) The tiered system applies different prices for the volumes used within each of three tiers (Tier 1, Tier 2 and Tier 3). Consumption falling within the lowest tier (Tier 1) is calculated by dividing the Tier 1 threshold (255 kL) by 365 and multiplying by the number of days in the bill period. Consumption falling with Tier 2 (310 kL) is then calculated on the same basis. Any residual consumption will fall within Tier 3, and be priced accordingly. The consumption calculation for each bill is separate to the subsequent consumption calculation for each subsequent bill, with no carry over of any unused portion of the thresholds from one bill to the next.

For more information contact Queensland Urban Utilities on 13 26 57.

Example: a residential customer uses 95 kL of water in a 90-day water meter reading period.

Step 1 – Work out how many kilolitres apply in each tier:

Tier 1 Consumption – threshold is 255 kL divided by 365 days multiplied by 90 days = 63 kL
Tier 2 Consumption – threshold is 310 kL divided by 365 days multiplied by 90 days = 76 kL
Tier 3 Consumption – threshold is all consumption above 76 kL

Step 2 – Calculate the charges using the kilolitres that apply in each tier:

$0.65 for 63 kL $40.95
$0.69 for 13 kL (76 kL minus 63 kL) $8.97
$1.23 for 19 kL (95 kL minus 76 kL) $23.37
$1.52 for 95 kL (State Government Bulk Water charge) $144.40

Quarterly Water Access Charge $40.74

Total water charges $258.43

(ii) If the commencement of the financial year is within a reading period, the consumption shall be apportioned by the number of days in each financial year and the applicable charges and calculation methodology for that particular financial year will be applied.

(iii) The charges and respective consumption tiers contained in the Water and Sewerage Charges shall be calculated by reference to reading periods and may be adjusted accordingly by Queensland Urban Utilities to coincide with those reading periods.

(iv) The annual access charges for the Water and Sewerage Charge is applied on a quarterly basis by dividing the annual charge by four. The quarterly charges will appear as separate line items on the bill and will be included in the total charges.

2010/11 PRICE LIST – IPSWICH

NON-RESIDENTIAL PROPERTIES – IPSWICH WATER AND SEWERAGE CHARGES

Effective 1 July 2010

Description	Category	Volume Charge Tier	2010/11	Unit
Water Services				
Annual Water Access Charge based on connection size:	[3] 3, 5, 6, 13 or 14			
25 mm or less			$330.72	pa
26-32 mm			$703.44	pa
33-40 mm			$1,118.16	pa
41-50 mm			$1,648.32	pa
51-80 mm			$4,173.36	pa
81-100 mm			$7,029.12	pa
101-150 mm			$16,803.72	pa
151-250 mm			$28,006.20	pa
Greater than 250mm			$33,607.44	pa
Annual Water Access Charge vacant land (unconnected)	[3] 3, 5, 6, 13 or 14		$324.48	pa
Fire service connection all sizes			$435.72	pa
Tier 1 Consumption	[3] 3, 5, 6, 13 or 14	Tier 1 <=320 kL	$0.79	/kL
Tier 2 Consumption		Tier 2 >320 kL	$1.60	/kL
State Government Bulk Water Charge			$1.45	/kL
Sewerage Services				
Sewerage Pedestal Charge	[2] other than 02, 03, 05, 09, 0901, 0902 or 4901	Per pedestal	$550.32	pa
Annual Sewerage Access Charge vacant land			$550.32	pa
Trade Waste				
Permit fee Cat 1			$325.92	pa
Cat 2			$447.48	pa
Cat 3			$729.36	pa
Category 3:				
Volume		> 500 kL pa	$1.33	/kL
Suspended solids		Standard Limit 300 mg/L	$1.28	/kg
Chemical oxygen demand		Standard Limit 600 mg/L	$1.08	/kg
Sulphate		Standard Limit 500 mg/L	$1.66	/kg
Nitrogen		Standard Limit 60 mg/L	$2.34	/kg
Phosphorus		Standard Limit 15 mg/L	$7.18	/kg
Sundry Charges				
Metered Standpipes				
Consumption Charge			$3.05	/kL
Alternate Source Water			$0.99	/kL

[1] Rating Categories
[2] Land Use Codes
[3] Differential Rating Categories

How to calculate the pricing

Charges for water used from 1 July 2010 are calculated on a tiered basis and applied depending on a property's total consumption.

Water accounts are billed quarterly with the exception of major non-residential customers, for whom Ipswich Water negotiates real time metering and monthly accounts.

(i) The tiered system applies different prices for the volumes used within each of two tiers (Tier 1 and Tier 2). Consumption falling within the lowest tier (Tier 1) is calculated by dividing the Tier 1 threshold of 320 kL by 365 and multiplying by the number of days in the bill period. Any residual consumption will fall within Tier 2, and be priced accordingly. The consumption calculation for each bill is separate to the subsequent consumption calculation for each subsequent bill, with no carry over of any unused portion of the thresholds from one bill to the next.

For more information contact Queensland Urban Utilities on 13 26 57.

Example: a commercial customer uses 125 kL of water in a 90-day water meter reading period.

Step 1 – Work out how many kilolitres apply in each tier:

Tier 1 Consumption – threshold is 320 kL divided by 365 days multiplied by 90 days = 79 kL
Tier 2 Consumption – threshold is all consumption above 79 kL

Step 2 – Calculate the charges using the kilolitres that apply in each tier:

$0.79 for 79 kL $62.41
$1.60 for 46 kL (125 kL minus 79 kL) $73.60
$1.45 for 125 kL (Bulk Water Consumption Charge) $181.25

Quarterly Water Access Charge $82.68 (25 mm or less)

Total water charges $399.94

(ii) If the commencement of the financial year is within a reading period, the consumption shall be apportioned by the number of days in each financial year and the applicable charges and calculation methodology for that particular financial year will be applied.

(iii) The charges and respective consumption tiers contained in the Water and Sewerage Charges shall be calculated by reference to reading periods and may be adjusted accordingly by Queensland Urban Utilities to coincide with those reading periods.

(iv) The annual access charge for water and sewerage is applied on a quarterly basis by dividing the annual charge by four. The quarterly charges will appear as separate line items on the bill and will be included in the total charges.

2010/11 PRICE LIST – IPSWICH

RESIDENTIAL PROPERTIES – IPSWICH WATER AND SEWERAGE CHARGES

Effective 1 July 2010

Description	General Category	Volume Charge Tier	2010/11	Unit
Water Services				
Residential				
Annual Water Access Charge	[1] 1, 2, 4, 8, 9, 10, 11, 15 (Excluding [2]: 01, 02, 03, 09), and 16		$324.48	pa
Annual Water Access Charge – connected but not metered	[1] 2, 5 and 60-89		$1,168.68	pa
Annual Water Access Charge vacant land – not connected	[2] 1, 4, or 72		$324.48	pa
Annual Water Access Charge vacant land – connected but not metered	[2] 1, 4, or 72		$1,168.68	pa
Tier 1 Consumption	Not identified in [3] 3, 5, 6, 13 or 14	Tier 1 <=320 kL	$0.79	/kL
Tier 2 Consumption		Tier 2 321-480 kL	$1.26	/kL
Tier 3 Consumption		Tier 3 >480 kL	$1.60	/kL
State Government Bulk Water Charge			$1.45	/kL
Fire service connection all sizes			$435.72	pa
Sewerage Services				
Annual Sewerage Access Charge	[2] 02, 03, 05, 09, 0901, 0902 and 4901		$550.32	pa

[1] Rating Categories
[2] Land Use Codes
[3] Differential Rating Categories

How to calculate the pricing

Charges for water used from 1 July 2010 are calculated on a tiered basis and applied depending on a property's total consumption.

(i) The tiered system applies different prices for the volumes used within each of three tiers (Tier 1, Tier 2 and Tier 3). Consumption falling within the lowest tier (Tier 1) is calculated by dividing the Tier 1 threshold (320 kL) by 365 and multiplying by the number of days in the bill period. Consumption falling with Tier 2 (480 kL) is then calculated on the same basis. Any residual consumption will fall within Tier 3, and be priced accordingly. The consumption calculation for each bill is separate to the subsequent consumption calculation for each subsequent bill, with no carry over of any unused portion of the thresholds from one bill to the next.

For more information contact Queensland Urban Utilities on 13 26 57.

Example: a residential customer uses 125 kL of water in a 90-day water meter reading period.

Step 1 – Work out how many kilolitres apply in each tier:

Tier 1 Consumption – threshold is 320 kL divided by 365 days multiplied by 90 days = 79 kL
Tier 2 Consumption – threshold is 480 kL divided by 365 days multiplied by 90 days = 118 kL
Tier 3 Consumption – threshold is all consumption above 118 kL

Step 2 – Calculate the charges using the kilolitres that apply in each tier:

$0.79 for 79 kL $62.41
$1.26 for 39 kL (118 kL minus 79 kL) $49.14
$1.60 for 7 kL (125 kL minus 118 kL) $11.20
$1.45 for 125 kL (Bulk Water Consumption Charge) $181.25

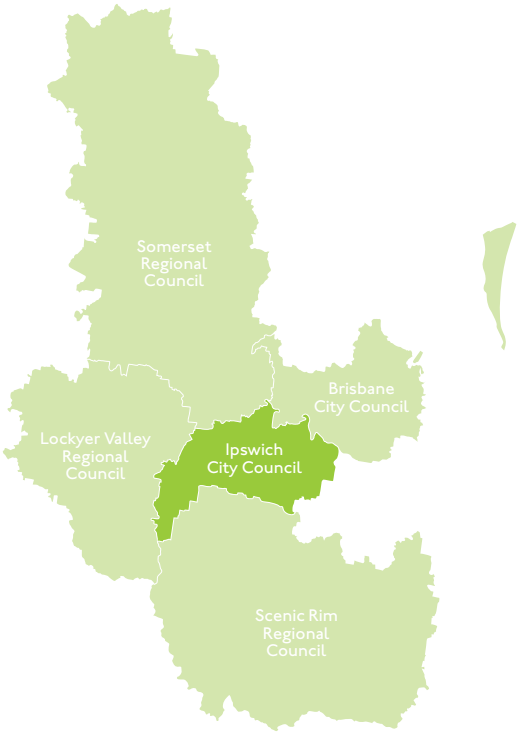
Quarterly Water Access Charge $81.12

Total water charges $385.12

(ii) If the commencement of the financial year is within a reading period, the consumption shall be apportioned by the number of days in each financial year and the applicable charges and calculation methodology for that particular financial year will be applied.

(iii) The charges and respective consumption tiers contained in the Water and Sewerage Charges shall be calculated by reference to reading periods and may be adjusted accordingly by Queensland Urban Utilities to coincide with those reading periods.

(iv) The annual access charge for water and sewerage is applied on a quarterly basis by dividing the annual charge by four. The quarterly charges will appear as separate line items on the bill and will be included in the total charges.



2010/11 PRICE LIST – LOCKYER VALLEY

NON-RESIDENTIAL PROPERTIES – LOCKYER VALLEY WATER AND SEWERAGE CHARGES

Effective 1 July 2010

Description	Volume Charge Tier	2010/11	Unit
Water Volume Charges			
Tier 1 Consumption	Tier 1 <=300 kL	$0.43	/kL
Tier 2 Consumption	Tier 2 >300 kL	$0.85	/kL
State Government Bulk Water Charge		$1.71	/kL
Water Services			
Former Gatton Shire			
Annual Water Access Charge – Full Pressure			
1st tenement (per tenement)		$430.92	pa
2nd to 6th tenements (per tenement)		$258.96	pa
7th and each additional tenement (per tenement)		$215.52	pa
Annual Water Access Charge – Constant Flow			
1st tenement (per tenement)		$316.56	pa
2nd to 6th tenements (per tenement)		$189.00	pa
7th and each additional tenement (per tenement)		$158.76	pa
Combined Residences/Businesses serviced by one meter			
Annual Water Access Charge – Full Pressure (per tenement)		$430.92	pa
Other Premises (Religious/Charitable/Non-Profit)			
Annual Water Access Charge – Full Pressure (per tenement)		$231.48	pa
Annual Water Access Charge– Constant Flow (per tenement)		$165.36	pa
Vacant land			
Annual Water Access Charge – Full Pressure Contiguous			
For the 1st 6 lots combined as one assessment		$255.12	pa
For the 7th and each additional lot		$127.56	pa
Annual Water Access Charge – Full Pressure Non-Contiguous			
Lots with an area less than 2023 m^2 (per lot)		$255.12	pa
Lots with an area of 2023 m^2 or more (per lot)		$382.68	pa
Annual Water Access Charge – Constant Flow Contiguous			
For the 1st 6 lots combined as one assessment		$179.52	pa
For the 7th and each additional lot		$89.76	pa
Annual Water Access Charge – Constant Flow Non-Contiguous			
Lots with an area less than 2023 m^2 (per lot)		$179.52	pa
Lots with an area of 2023 m^2 or more (per lot)		$283.56	pa
Former Laidley Shire (excluding Forest Hill)			
Annual Water Access Charge – Full Pressure (standard) (per tenement)		$382.68	pa
Annual Water Access Charge – Full Pressure Other (Religious/ Charitable/Non-profit) (per tenement)		$231.48	pa
Annual Water Access Charge – Full Pressure Vacant land (per tenement)		$382.68	pa
Annual Water Access Charge – Constant Flow (limited flow) (per tenement)		$283.56	pa
Annual Water Access Charge – Constant Flow Other (Religious/ Charitable/Non-profit) (per tenement)		$165.36	pa
Annual Water Access Charge – Constant Flow Vacant land (per tenement)		$283.56	pa
Annual Water Access Charge – Water Pipeline (per tenement)		$382.68	pa

Description (cont)	2010/11	Unit
Water Services		
Forest Hill		
Annual Water Access Charge – Full Pressure (per tenement)	$340.20	pa
Annual Water Access Charge – Other (Religious/Charitable/ Non-profit) (per tenement)	$245.76	pa
Annual Water Access Charge vacant land (per tenement)	$340.20	pa
Annual Sewerage Access Charge – All Lockyer Valley Service Area's		
Sewerage charge 1st pedestal	$407.76	pa
Sewage additional pedestals (per pedestal)	$308.28	pa
Sewerage Access Charge - Vacant land	$223.80	pa
Pressure Sewer Main	$308.28	pa
Sewerage charge 1st pedestal – Laidley Caravan Park	$407.76	pa
Sewerage additional pedestal – Laidley Caravan Park (per pedestal)	$264.60	pa
Sundry Charges		
Metered Standpipes		
Bond (Standpipe Key)	$210.00	Each Standpipe
Per kilolitre or part thereof	$3.12	/kL
Water taken by registered water carters	$3.12	/kL
Preston		
For the twelve months ending 30 June 2011, the charges for water to be made and levied on properties in the Preston area which are connected or intending to connect to the water main provided by Toowoomba Regional Council, will be the charges as determined and advised by Toowoomba Regional Council.		

How to calculate the pricing

Charges for water used from 1 July 2010 are calculated on a tiered basis and applied depending on a property's total consumption.

(i) The tiered system applies different prices for the volumes used within each of two tiers (Tier 1 and Tier 2). Consumption falling within the lowest tier (Tier 1) is calculated by dividing the Tier 1 threshold of 300 kL by 365 and multiplying by the number of days in the bill period multiplied by the number of connections. Any residual consumption will fall within Tier 2, and be priced accordingly. The consumption calculation for each bill is separate to the subsequent consumption calculation for each subsequent bill, with no carry over of any unused portion of the thresholds from one bill to the next.

For more information contact Queensland Urban Utilities on 13 26 57.

Example: a commercial (Gatton) full pressure customer uses 95 kL of water in a 90-day water meter reading period.

Step 1 – Work out how many kilolitres apply in each tier:

Tier 1 Consumption – threshold is 300 kL divided by 365 days multiplied by 90 days = 74 kL
Tier 2 Consumption – threshold is all consumption above 74 kL

Step 2 – Calculate the charges using the kilolitres that apply in each tier:

$0.43 for 74 kL $31.82
$0.85 for 21 kL (95 kL minus 74 kL) $17.85
$1.71 for 95 kL (State Government Bulk Water Consumption charge) $162.45

Quarterly Water Access Charge $107.73 (commercial Gatton full pressure 1st tenement)

Total water charges $319.85

(ii) If the commencement of the financial year is within a reading period, the consumption shall be apportioned by the number of days in each financial year and the applicable charges and calculation methodology for that particular financial year will be applied.

(iii) The charges and respective consumption tiers contained in the Water and Sewerage Charges shall be calculated by reference to reading periods and may be adjusted accordingly by Queensland Urban Utilities to coincide with those reading periods.

(iv) The annual access charge for water and sewerage is applied on a quarterly basis by dividing the annual charge by four. The quarterly charges will appear as separate line items on the bill and will be included in the total charges.

2010/11 PRICE LIST – LOCKYER VALLEY

RESIDENTIAL PROPERTIES – LOCKYER VALLEY WATER AND SEWERAGE CHARGES

Effective 1 July 2010

Description	Volume Charge Tier	2010/11	Unit
Water Volume Charges			
Tier 1 Consumption	Tier 1 <=300 kL	$0.22	/kL
Tier 2 Consumption	Tier 2 >300 kL	$1.06	/kL
State Government Bulk Water Charge		$1.71	/kL
Water Access Charges			
Former Gatton Shire			
Annual Water Access Charge – Full Pressure (per tenement)		$382.68	pa
Annual Water Access Charge – Constant Flow (per tenement)		$283.56	pa
Vacant Land Annual Water Access Charge			
Full Pressure Contiguous			
For the 1st six lots combined as one assessment		$255.12	pa
For the 7th and each additional lot		$127.56	pa
Full Pressure Non-Contiguous			
Lots with an area less than 2023 m^2 (per lot)		$255.12	pa
Lots with an area of 2023 m^2 or more (per lot)		$382.68	pa
Constant Flow Contiguous			
For the 1st six lots combined as one assessment		$179.52	pa
For the 7th and each additional lot		$89.76	pa
Constant Flow Non-Contiguous			
Lots with an area less than 2023 m^2 (per lot)		$179.52	pa
Lots with an area of 2023 m^2 or more (per lot)		$283.56	pa
Former Laidley Shire (excluding Forest Hill)			
Annual Water Access Charge – Full Pressure (per tenement)		$382.68	pa
Annual Water Access Charge – Limited Flow (constant flow) (per tenement)		$283.56	pa
Vacant Land – Full Pressure (per tenement)		$382.68	pa
Vacant Land – Limited Flow (constant flow) (per tenement)		$283.56	pa
Forest Hill			
Annual Water Access Charge – Full Pressure (per tenement)		$340.20	pa
Annual Water Access Charge – Vacant land (per tenement)		$340.20	pa
Annual Sewerage Access Charge – All Lockyer Valley Service Areas			
Sewerage Access Charge (per assessment)		$407.76	pa
Sewerage Access Charge – Vacant land (per lot)		$223.80	pa
Pressure Sewer Main (per assessment)		$308.28	pa
Sewerage additional pedestal (per pedestal)		$308.28	pa

Preston

For the twelve months ending 30 June 2011, the charges for water to be made and levied on properties in the Preston area which are connected or intending to connect to the water main provided by Toowoomba Regional Council, will be the charges as determined and advised by Toowoomba Regional Council.

How to calculate the pricing

Charges for water used from 1 July 2010 are calculated on a tiered basis and applied depending on a property's total consumption.

(i) The tiered system applies different prices for the volumes used within each of two tiers (Tier 1 and Tier 2). Consumption falling within the lowest tier (Tier 1) is calculated by dividing the Tier 1 threshold of 300 kL by 365 and multiplying by the number of days in the bill period multiplied by the number of connections. Any residual consumption will fall within Tier 2, and be priced accordingly. The consumption calculation for each bill is separate to the subsequent consumption calculation for each subsequent bill, with no carry over of any unused portion of the thresholds from one bill to the next.

For more information contact Queensland Urban Utilities on 13 26 57.

Example: a Gatton residential full pressure customer uses 95 kL of water in a 90-day water meter reading period.

Step 1 – Work out how many kilolitres apply in each tier:

Tier 1 Consumption – threshold is 300 kL divided by 365 days multiplied by 90 days = 74 kL
Tier 2 Consumption – threshold is all consumption above 74 kL

Step 2 – Calculate the charges using the kilolitres that apply in each tier:

$0.22 for 74 kL $16.28
$1.06 for 21 kL (95 kL minus 74 kL) $22.26
$1.71 for 95 kL (State Government Bulk Water Consumption Charge) $162.45

Quarterly Water Access Charge $95.67 (Gatton residential full pressure charge)

Total water charges $296.66

(ii) If the commencement of the financial year is within a reading period, the consumption shall be apportioned by the number of days in each financial year and the applicable charges and calculation methodology for that particular financial year will be applied.

(iii) The charges and respective consumption tiers contained in the Water and Sewerage Charges shall be calculated by reference to reading periods and may be adjusted accordingly by Queensland Urban Utilities to coincide with those reading periods.

(iv) The annual access charge for water and sewerage is applied on a quarterly basis by dividing the annual charge by four. The quarterly charges will appear as separate line items on the bill and will be included in the total charges.

2010/11 PRICE LIST – SCENIC RIM

NON-RESIDENTIAL PROPERTIES – SCENIC RIM WATER AND SEWERAGE CHARGES

Effective 1 July 2010

Description		2010/11	Unit
Water Services			
Annual Water Access Charge based on connection size (determined by a flow capacity factor, FCF)			
Diameter	FCF		
20 mm	1.0000	$342.12	pa
25 mm	1.5625	$534.56	pa
32 mm	2.5600	$875.84	pa
40 mm	4.0000	$1,368.48	pa
50 mm	6.2500	$2,138.24	pa
65 mm	12.0193	$4,112.04	pa
80 mm	16.0000	$5,473.92	pa
100 mm	25.0000	$8,553.00	pa
150 mm	56.2500	$19,244.24	pa
200 mm	100.0000	$34,212.00	pa
Annual Water Access Charge – Vacant land		$342.12	pa
Annual Water Access Charge – Restricted demand		$342.12	pa
Water Consumption		$0.81	/kL
State Government Bulk Water Charge		$1.82	/kL
Sewerage Services			
Annual Sewerage Access Charge (1st pedestal)		$502.80	pa
Sewerage additional pedestals (per pedestal)		$304.44	pa
Sewerage Access Charge – Vacant land (per lot)		$275.04	pa
Sundry Charges			
Metered Standpipes			
Water Tag Deposit		$21.00	pa
Water Consumption		$2.63	/kL

How to calculate the pricing

Charges for water used from 1 July 2010 are calculated depending on a property's total consumption.

(i) The consumption charges are calculated using a single tier approach where the actual consumption is multiplied using a single tariff (separated by a volume charge and a bulk water component).

For more information contact Queensland Urban Utilities on 13 26 57.

Example: a commercial customer with a 20 mm connection uses 95 kL of water in a 90-day water meter reading period.

Calculate the charges using the kilolitres that apply:

Consumption charge: 95 kL multiplied by $0.81 = $76.95
State Government Bulk Water Charge: 95 kL multiplied by $1.82 = $172.90

Quarterly Water Access Charge $85.53 (20 mm connection)

Total water charges $335.38

(ii) If the commencement of the financial year is within a reading period, the consumption shall be apportioned by the number of days in each financial year and the applicable charges and calculation methodology for that particular financial year will be applied.

(iii) The charges and respective consumption tiers contained in the Water and Sewerage Charges shall be calculated by reference to reading periods and may be adjusted accordingly by Queensland Urban Utilities to coincide with those reading periods.

(iv) The annual access charge for water and sewerage is applied on a quarterly basis by dividing the annual charge by four. The quarterly charges will appear as separate line items on the bill and will be included in the total charges.

2010/11 PRICE LIST – SCENIC RIM

RESIDENTIAL PROPERTIES – SCENIC RIM WATER AND SEWERAGE CHARGES

Effective 1 July 2010

Description		2010/11	Unit
Water Services			
Annual Water Access Charge based on connection size (determined by a flow capacity factor, FCF)			
Diameter	FCF		
20 mm	1.0000	$342.12	pa
25 mm	1.5625	$534.56	pa
32 mm	2.5600	$875.84	pa
40 mm	4.0000	$1,368.48	pa
50 mm	6.2500	$2,138.24	pa
65 mm	12.0193	$4,112.04	pa
80 mm	16.0000	$5,473.92	pa
100 mm	25.0000	$8,553.00	pa
150 mm	56.2500	$19,244.24	pa
200 mm	100.0000	$34,212.00	pa
Annual Water Access Charge – Vacant land		$342.12	pa
Annual Water Access Charge – Restricted demand		$342.12	pa
Water Consumption		$0.81	/kL
State Government Bulk Water Charge		$1.82	/kL
Sewerage Services			
Annual Sewerage Access Charge		$502.80	pa
Annual Sewerage Access Charge – Vacant land (per lot)		$275.04	pa

How to calculate the pricing

Charges for water used from 1 July 2010 are calculated depending on a property's total consumption.

(i) The consumption charges are calculated using a single tier approach where the actual consumption is multiplied using a single tariff (separated by a volume charge and a bulk water component).

For more information contact Queensland Urban Utilities on 13 26 57.

Example: a residential customer with a 20 mm water connection uses 95 kL of water in a 90-day water meter reading period.

Calculate the charges using the kilolitres that apply:

Consumption charge: 95 kL multiplied by $0.81 = $76.95
State Government Bulk Water Charge: 95 kL multiplied by $1.82 = $172.90
Quarterly Water Access Charge $85.53 (20 mm)
Total water charges $335.38

(ii) If the commencement of the financial year is within a reading period, the consumption shall be apportioned by the number of days in each financial year and the applicable charges and calculation methodology for that particular financial year will be applied.

(iii) The charges and respective consumption tiers contained in the Water and Sewerage Charges shall be calculated by reference to reading periods and may be adjusted accordingly by Queensland Urban Utilities to coincide with those reading periods.

(iv The annual access charge for water and sewerage is applied on a quarterly basis by dividing the annual charge by four. The quarterly charges will appear as separate line items on the bill and will be included in the total charges.

2010/11 PRICE LIST – SOMERSET

NON-RESIDENTIAL PROPERTIES – SOMERSET WATER AND SEWERAGE CHARGES

Effective 1 July 2010

Description	Volume Charge Tier	2010/11	Unit
Water Services			
Annual Water Access Charge (per connection)		$287.40	pa
Bore Water Access Charge (Moore and Coominya townships)		$274.92	pa
Tier 1 Consumption – per connection	Tier 1 (<=300 kL)	$0.23	/kL
Tier 2 Consumption – per connection	Tier 2 (>300 kL)	$0.53	/kL
State Government Bulk Water Charge		$2.09	/kL
Sewerage Services			
Former Kilcoy Shire			
Sewerage Access Charge (per pedestal) - Government Premises		$524.16	pa
Sewerage Access Charge (per pedestal) - Other non-residential premises		$386.04	pa
Sewerage Access Charge – Vacant land (per lot)		$340.92	pa
Former Esk Shire			
Sewerage Access Charge (1st pedestal)	Base Charge	$533.52	pa
Building used exclusively for public worship		68% of base charge	pa
Hall on land attracting a General rate		50%	pa
Hall (excluding land attracting a General rate)		68%	pa
Kindergarten School		68%	pa
Government Premises (excluding Toogoolawah State High School)		105%	pa
Toogoolawah High School		158%	pa
General non-residential		100%	pa
For each additional pedestal, urinal and slop sink:		Per pedestal	pa
Building used exclusively for public worship		5% of base charge	pa
Hall		5%	pa
Kindergarten School		5%	pa
Premises where toilet facilities are made available for employees use only.		12%	pa
Premises where toilet facilities are made available for customer use:		Per pedestal	
Hotel or Motel		38% of base charge	pa
Nursing Home		38%	pa
Caravan Park facility provided for the ordinary travelling public		12%	pa
Government Premises (excluding Toogoolawah State High School)		105%	pa
Toogoolawah High School		158%	pa
Other premises		19%	pa
Racecourse and showgrounds – single charge for all additional pedestals regardless of number		5%	pa
Public Convenience		50%	pa
Allotment to which Council is prepared to provide a sewerage service, but which is not supplied with a sewerage service and on which a dwelling or other building is constructed – per allotment.		50%	pa
Sewerage charges in respect of Vacant Land – per allotment		50%	pa

Description	2010/11	Unit
Sundry Charges		
Metered Standpipes		
Lease of Water Standpipe	$210.00	
Water Consumption	$2.62	/kL

How to calculate the pricing

Charges for water used from 1 July 2010 are calculated on a tiered basis and applied depending on a property's total consumption.

(i) The tiered system applies different prices for the volumes used within each of two tiers (Tier 1 and Tier 2). Consumption falling within the lowest tier (Tier 1) is calculated by dividing the Tier 1 threshold of 300 kL by 365 and multiplying by the number of days in the bill period and multiplied by the number of connections. Any residual consumption will fall within Tier 2, and be priced accordingly. The consumption calculation for each bill is separate to the subsequent consumption calculation for each subsequent bill, with no carry over of any unused portion of the thresholds from one bill to the next.

For more information contact Queensland Urban Utilities on 13 26 57.

Example: a commercial customer with a single connection uses 95 kL of water in a 90-day water meter reading period.

Step 1 – Work out how many kilolitres apply in each tier:

Tier 1 Consumption – threshold is 300 kL divided by 365 days multiplied by 90 days = 74 kL
Tier 2 Consumption – threshold is all consumption above 74 kL

Step 2 – Calculate the charges using the kilolitres that apply in each tier:

$0.23 for 74 kL $17.02
$0.53 for 21 kL (95 kL minus 74 kL) $11.13
$2.09 for 95 kL (Bulk Water Consumption Charge) $198.55

Quarterly Water Access Charge $71.85

Total water charges $298.55

(ii) If the commencement of the financial year is within a reading period, the consumption shall be apportioned by the number of days in each financial year and the applicable charges and calculation methodology for that particular financial year will be applied.

(iii) The charges and respective consumption tiers contained in the Water and Sewerage Charges shall be calculated by reference to reading periods and may be adjusted accordingly by Queensland Urban Utilities to coincide with those reading periods.

(iv) The annual access charge for water and sewerage is applied on a quarterly basis by dividing the annual charge by four. The quarterly charges will appear as separate line items on the bill and will be included in the total charges.

2010/11 PRICE LIST – SOMERSET

RESIDENTIAL PROPERTIES – SOMERSET WATER AND SEWERAGE CHARGES

Effective 1 July 2010

Description	Volume Charge Tier	2010/11	Unit
Water Services			
Annual Water Access Charge (per connection)		$287.40	pa
Bore Water Annual Access Charge (Moore and Coominya townships)		$274.92	pa
Tier 1 Consumption	Tier 1 (<=300 kL)	$0.23	/kL
Tier 2 Consumption	Tier 2 (>300 kL)	$0.53	/kL
State Government Bulk Water Charge		$2.09	/kL
Sewerage Services			
Annual Sewerage Access Charge			
Lowood, Fernvale, Esk Toogoolawah			
Per single residence, flat, one pedestal premise		$533.52	pa
Sewerage Access Charge – Vacant land (per lot)		$266.76	pa
Kilcoy			
Per single residence, flat, one pedestal premise		$386.04	pa
Sewerage Access Charge – Vacant land (per lot)		$340.92	pa

How to calculate the pricing

Charges for water used from 1 July 2010 are calculated on a tiered basis and applied depending on a property's total consumption.

(i) The tiered system applies different prices for the volumes used within each of two tiers (Tier 1 and Tier 2). Consumption falling within the lowest tier (Tier 1) is calculated by dividing the Tier 1 threshold of 300 kL by 365 and multiplying by the number of days in the bill period and multiplied by the number of connections. Any residual consumption will fall within Tier 2, and be priced accordingly. The consumption calculation for each bill is separate to the subsequent consumption calculation for each subsequent bill, with no carry over of any unused portion of the thresholds from one bill to the next.

For more information contact Queensland Urban Utilities on 13 26 57.

Example: a residential customer with a single connection uses 95 kL of water in a 90-day water meter reading period.

Step 1 – Work out how many kilolitres apply in each tier:

Tier 1 Consumption – threshold is 300 kL divided by 365 days multiplied by 90 days = 74 kL
Tier 2 Consumption – threshold is all consumption above 74 kL

Step 2 – Calculate the charges using the kilolitres that apply in each tier:

$0.23 for 74 kL $17.02
$0.53 for 21 kL (95 kL minus 74 kL) $11.13
$2.09 for 95 kL (Bulk Water Consumption Charge) $198.55

Quarterly Water Access Charge $71.85

Total water charges $298.55

(ii) If the commencement of the financial year is within a reading period, the consumption shall be apportioned bythe number of days in each financial year and the applicable charges and calculation methodology for that particular financial year will be applied.

(iii) The charges and respective consumption tiers contained in the Water and Sewerage Charges shall be calculated by reference to reading periods and may be adjusted accordingly by Queensland Urban Utilities to coincide with those reading periods.

(iv) The annual access charge for water and sewerage is applied on a quarterly basis by dividing the annual charge by four. The quarterly charges will appear as separate line items on the bill and will be included in the total charges.

ANNEX 2: CUSTOMER SERVICE CHARTER

Customer Charter

A summary of your rights and responsibilities

QUEENSLAND UrbanUtilities

For residential and small business customers

This Customer Charter outlines our commitment to delivering water and wastewater services to our customers.

Queensland Urban Utilities is one of the largest water distributor-retailers in Australia, supplying around 105,000 megalitres of tap water to 1.3 million residents each year. We also remove and treat customers' sewage and wastewater.

Formed as a result of the State Government's changes to the water industry, Queensland Urban Utilities is owned by Brisbane City Council, Ipswich City Council, Lockyer Valley Regional Council, Scenic Rim Regional Council and Somerset Regional Council.

Until July 2011, Queensland Urban Utilities will continue to deliver water and wastewater services against the Customer Service Standards that are in place within each local government area.

To view the Customer Service Standard applicable to your property, visit our website – **www.urbanutilities.com.au**

Reliability of water supply

Queensland Urban Utilities delivers a safe and reliable water supply to our customers.

Maintenance and management of our assets and services

The effective maintenance and management of our assets is critical to ensuring safe and reliable water and sewerage services are provided to our customers.

We will:

- maintain the water service up to and including the property water meter
- maintain the wastewater service up to the property connection.

You should:

- advise us immediately if damage occurs to any of our assets or services on your property by calling us on 13 23 64
- report deliberate damage or suspected criminal activity relating to our assets or services by calling us on 13 23 64
- maintain all internal plumbing in good working order and in compliance with plumbing regulations
- engage a licensed plumber to repair any water leaks occurring on the property side of the water meter, including the fitting connecting the water meter to your pipes.

Interruption to supply

While we work hard to ensure your water supply is not interrupted, we may occasionally need to carry out planned maintenance on our assets. In these situations your water services may be interrupted for a short period of time.

Should your supply be interrupted due to planned or unplanned works, our priority is to minimise inconvenience to affected customers.

We will:

- provide advanced notice to you before there is any planned interruption to your water and wastewater services
- endeavour to restore water supply in the shortest possible time should unplanned service interruptions or emergencies such as a burst water main occur.

You should:

- contact us 24 hours a day, seven days a week on 13 23 64 to report any service difficulties and emergencies.

Pressure and flow

Queensland Urban Utilities has programs in place to manage water pressure and flow across its network of pipes.

We will:

- deliver water to your water meter within pressure targets identified in the relevant Customer Service Standard for your local government area.

You should:

- contact us 24 hours a day, seven days a week, on 13 23 64 to report any significant change in your water pressure or flow.

New connections

We are committed to providing water and wastewater connections to your property in a timely and cost-effective way. For more information about response times for new connections, please refer to the relevant Customer Service Standard for your local government area.

Specialist services

Queensland Urban Utilities is working with patients on the Home Haemodialysis Patient List to ensure adequate water pressure will always be available.

If you or someone living at your house requires water for your specialist life saving equipment you should contact us on 13 26 57.

Water quality

Queensland Urban Utilities delivers drinking water of a very high standard to our customers.

We have a rigorous water quality monitoring program to ensure our water meets the water quality criteria of the National Health and Medical Research Council's *Australian Drinking Water Guidelines*.

We will:

- supply you with water that is safe to drink
- monitor and assess the quality of the drinking water supplied
- publish annual water quality data on our website.

You should:

- ensure all internal plumbing is maintained in good order and in compliance with plumbing regulations
- contact us on 13 23 64 for any emergencies or issues regarding water quality
- contact us on 13 26 57 for general enquiries relating to water quality.

Metering

We understand the importance of ensuring meter readings are accurate and customers are charged correctly.

We will:

- read your meter according to a regular schedule, usually quarterly, to maintain consistency of reading periods
- estimate a reading, based on previous consumption levels, when a water meter is not accessible, or a water meter is found to be unreliable.

You should:

- ensure your water meter is not tampered with, and that access is not obstructed (for example by a garden bed or barrier).

Testing your water meter

We will:

- provide you with a meter testing service for a prepaid fee
- allow you to be present during testing if requested
- provide you with a notice of test results
- replace the water meter, refund the test charge and review the water consumption charges for the property if the water meter is found to be faulty.

You should:

- contact us on 13 26 57 to request to have your water meter tested should you believe it is not registering accurately, and have ruled out the possibility of a leak. A prepaid fee applies for this service.

Effective transport of wastewater

Our extensive wastewater system is designed to provide the highest level of wastewater services possible to ensure public health and environmental protection.

Anything that goes down a drain or toilet will make its way through Queensland Urban Utilities' wastewater system.

We will:

- remove the wastewater from your property and treat it to a high quality, to protect public health and the environment
- maintain and operate the wastewater service up to the property connection point
- monitor the quality of our treated wastewater before it passes back to the environment.

You should:

- maintain the sewerage pipes on your property, making sure they are free from cracks and blockages
- dispose of any waste responsibly - cooking oil, paints, pesticides, cleaning products and pool chemicals should never be poured down the sink, gutter or any other drain
- plant carefully - always check for pipes before planting, and choose trees with non-invasive roots.

Trade waste

Trade waste is water-borne waste from a business or manufacturing premises. All businesses and industries producing trade waste must have approval to discharge waste into the sewerage system.

Billing and payment

Issuing accounts

We issue residential water and sewerage accounts quarterly to all properties where water and wastewater services are provided. Business water and sewerage accounts are issued either monthly or quarterly.

Accounts will be sent to the owner of the property at the last notified postal address.

Your account will include information including the period of the account, the bulk water component, the total charge, how to pay your account, as well as any subsidies or remissions applied.

Charges

Queensland Urban Utilities' charges include fixed charges for water and sewerage access, as well as consumption charges based on the amount of water you use each quarter. Refer to our website (**www.urbanutilities.com.au**) for charges applicable to your region.

Access charges apply to all properties where water and/or wastewater services are available from Queensland Urban Utilities.

Consumption charges are:

- a tiered charge per kilolitre - tiered pricing uses water consumption thresholds to encourage customers in relevant regions to use water efficiently
- the State Government Bulk Water charge - this is a State Government charge for the cost of treated water.

Businesses and industries that generate trade waste are charged based on the type of trade waste that is generated on a property. These charges are based on the treatment of additional loads of concentrated nutrients and pollutants generated by the business. Trade waste charges are based on a user pays system and are set according to the volume and type of discharge your business generates.

Paying your account

Queensland Urban Utilities offers a range of options for you to pay your account. You can pay your account:

- by Direct Debit
- through our website **www.urbanutilities.com.au**
- through your financial institution using BPAY®
- by phone – 1300 123 141
- by mail
- in person at any branch of the Commonwealth Bank or any Australia Post outlet.

Our payment terms provide 30 days to pay your water and wastewater account. You should pay your account in full by the due date in order to avoid interest being charged to your account. If full payment is not received by the due date, a compounding interest of 11% per annum will accrue daily on any amount owing. Account payments by credit card over the phone or internet will incur a 0.72% surcharge to cover the costs associated with credit card transactions. This fee is calculated on the total amount paid.

Tenant Water Advice

Queensland Urban Utilities will provide a separate Water Advice to many residential tenanted properties that have an individual water meter. This advice provides the tenant with information to be able to monitor their own water consumption. This advice is not an account and no payment is required by the residential tenant.

Subsidies and remissions

Queensland Urban Utilities administers the pensioner State Government Water Subsidy. For current eligibility requirements, refer to the Queensland Government.

We also administer a number of water subsidies and remissions offered by local councils. Eligibility for these subsidies and remissions will continue to be managed by the councils.

Queensland Urban Utilities offers a remission for haemodialysis patients on their water accounts. Customers approved for the remission receive their first 50 kilolitres of water usage free of charge each quarter.

For more information about subsidies or remissions or, please contact Queensland Urban Utilities on 13 26 57.

Financial hardship

We understand that sometimes our customers may find it difficult to pay their water and wastewater accounts. Please contact Queensland Urban Utilities on 13 26 57 as soon as possible to discuss payment options if you are having difficulty paying your account. You can find more information about our Financial Hardship policy on our website.

We will:

- use the guidelines set out in our Financial Hardship policy to manage your case.

You should:

- visit our website (**www.urbanutilities.com.au**) for a number of practical tips to help you keep water use to responsible levels
- advise us if you are experiencing financial difficulty as soon as possible.

Customer service

Queries or complaints

At Queensland Urban Utilities we are committed to delivering accessible and responsive customer service. We take our customer service obligations seriously. Tell us if we are not meeting your expectations. You can contact us in a number of ways:

Phone
For general enquiries contact us from 7am to 7pm weekdays on **13 26 57**.
For faults and emergencies contact us 24 hours a day, seven days a week, on **13 23 64**.
If you are calling from overseas please call **+617 3403 8069**.

Email
customerservice@urbanutilities.com.au

In writing
Queensland Urban Utilities,
GPO Box 2765, Brisbane QLD 4001

In person
Level 1, TC Beirne Centre,
315 Brunswick Street Mall, Fortitude Valley

How we manage complaints

We will investigate your enquiry or complaint and attempt to resolve it to your satisfaction. A response (or an update on the progress of the investigation) will be provided within 20 working days. We will respond, giving the reasons for our decision and provide a contact person to notify if you are not satisfied and would like the decision to be reviewed internally. If you are still not satisfied with the outcome, you have the right to take your concern to the Queensland Ombudsman. You can contact the Queensland Ombudsman via:

Phone
07 3005 7000

Toll Free (Landlines only)
1800 068 908

Web
www.ombudsman.qld.gov.au

Privacy of your information

Queensland Urban Utilities is committed to protecting the privacy of our customers, employees and agents.

Queensland Urban Utilities:

- Recognises and respects the importance of keeping individuals' personal information private
- Protects and maintains the security of individuals' personal information
- Only uses individuals' personal information for the purpose for which it was collected or as otherwise authorised.

You can view our Information Privacy Policy on our website.

Accessing and amending your information

You can access and/or amend any inaccurate, incomplete, out of date or misleading personal information in accordance with your rights under the *Information Privacy Act 2009*.

ANNEX 3: CURRENT INFRASTRUCTURE CHARGES

INFRASTRUCTURE CHARGES

Infrastructure planning and charging are undertaken in accordance with the *Sustainable Planning Act 2009* (SPA). SPA gives local governments the ability to assess development applications for trunk infrastructure requirements and financial contributions toward the trunk infrastructure networks including water and wastewater networks.

Financial contributions may be levied for trunk infrastructure only. Trunk infrastructure is defined as higher order development infrastructure shared between developments in accordance with the Standard Inclusions and Exclusions for Trunk Infrastructure Charges.

Assessment of development applications must be made in accordance with adopted local government planning scheme policies or priority infrastructure plan. A charge levied on a development should reflect the development's demand on the water and wastewater network, excluding demand associated with the existing lawful use of the premises.

All participant councils are collecting contributions either under:

- Water and Sewerage Headworks Policies (originally made in accordance with the *Local Government Planning and Environment Act 1990*); or
- Infrastructure Contribution Planning Scheme Policies made in accordance with *Integrated Planning Act 1997* extended under SPA.

Developers may be required to provide infrastructure contributions in the form of works contributions (as opposed to monetary), where such works are necessary for new development. The value of trunk works provided will be off-settable against the required infrastructure contribution. Queensland Urban Utilities may enter into an infrastructure agreement with the developer, which sets out terms for reimbursement of the developer's costs that are in excess of the required infrastructure contributions.

1. BRISBANE

The citywide water supply network is distributed among 26 contribution areas. Table A3.1 outlines the Citywide Water Supply Infrastructure Contributions in Infrastructure Charging Units per Equivalent Tenement (ICUs/ET) and then converts them to actual rates using the current value of an ICU for the 2010/11 financial year ($1.89).

The sewerage network comprises of seven catchments and their sub-catchments. Tables A3.2-A3.7 outline the citywide infrastructure contributions in ICUs/ET and then converts them to actual rates using the current value of an ICU for the 2010/11 financial year ($1.89).

The Rochedale high growth area infrastructure contributions are not covered under the citywide water supply and sewerage infrastructure contributions. Tables A3.8-A3.10 outline the Rochedale high growth water supply and sewerage infrastructure contributions in ICUs/ET and then converts them to actual rates using the current value of an ICU for the 2010/11 financial year ($1.74).

2. IPSWICH

The water supply network is distributed amongst 34 water supply charge areas. Table A3.11 outlines the charge rates in rate per equivalent persons (Rate/EP) and rate per non-residential unit (Rate/NRU) and then converts them to actual charge rates using the current unit charge multiplier for the 2010/11 financial year ($1.1724).

The sewerage network is distributed among 57 sewerage catchments. Table A3.12 outlines the charge rates in Rate/EP and Rate/NRU and then converts them to actual charge rates using the current unit charge multiplier for the 2010/11 financial year ($1.1724).

3. LOCKYER VALLEY

Refer to Table A3.13 for water supply infrastructure charges and Table A3.14 for sewerage infrastructure charges.

4. SCENIC RIM

Refer to Table A3.15 for water supply infrastructure charges and Table A3.16 for sewerage infrastructure charges.

5. SOMERSET

Refer to Table A3.17 for water supply infrastructure charges and Table A3.18 for sewerage infrastructure charges.

	Council				
Details	**Brisbane**	**Ipswich**	**Lockyer Valley**	**Somerset**	**Scenic Rim**
Current Source for Infrastructure Charges	5 Infill and Citywide Infrastructure Contributions Planning Scheme Policies 14 High Growth/Area Specific Infrastructure Contributions Planning Scheme Policies (IPA s6.1.20)	Ipswich PSP5 – Infrastructure (IPA s6.1.20)	Laidley PSP9 – Contributions for Water and Sewerage Headworks Gatton PSP27 – Water Supply and Sewerage Contributions (Headworks)	Esk PSP5 Water Supply and Sewerage Headworks Kilcoy Temporary Local Planning Instrument for Infrastructure Contributions (IPA Ch2 Division 4)	Beaudesert PSP5 – Infrastructure Contributions (IPA s6.1.20) Boonah PSP3 – Water and Sewerage Headworks Contributions Ipswich – See Ipswich

Table A3.1 Brisbane – Citywide Water Supply Infrastructure Contributions

Contribution Area	Infrastructure Contributions (ICUs/ET)						Actual Rate $2010/11 ($/ET)
	Local Distribution	Shared Distribution	Bulk Transport	Bulk Supply & Treatment	Preparation Charge	Total Contribution	
Acacia Ridge	1,815	598	1,342	867	5	4,627	8,745
Aspley	2,080	598	1,342	867	5	4,892	9,246
Australia TradeCoast	4,506	383	860	556	5	6,310	11,926
Bartleys Hill	3,873	598	1,342	867	5	6,685	12,635
Bracken Ridge	2,045	598	1,342	867	5	4,857	9,180
Eildon Hill	2,258	598	1,342	867	5	5,070	9,582
Ferny Grove	4,308	598	1,342	867	5	7,120	13,457
Forest Lake	2,853	598	1,342	867	5	5,665	10,707
Green Hill	1,373	598	1,342	867	5	4,185	7,910
Inala	2,079	598	1,342	867	5	4,891	9,244
Karana Downs	3,409	598	1,342	867	5	6,221	11,758
Kuraby North/ Karawatha	1,466	598	1,342	867	5	4,278	8,085
Manly Roles	2,732	598	1,342	867	5	5,544	10,478
Milne Hill/Stafford	2,504	598	1,342	867	5	5,316	10,047
Mt Crosby North	1,948	598	1,342	867	5	4,760	8,996
Mt Crosby South	1,716	598	1,342	867	5	4,528	8,558
Mt Gravatt/ Holland/Toohey	2,166	598	1,342	867	5	4,978	9,408
Mt Ommaney	2,556	598	1,342	867	5	5,368	10,146
North Pine Aspley	1,097	598	1,342	867	5	3,909	7,388
Richlands	1,571	598	1,342	867	5	4,383	8,284
Rochedale	2,753	598	1,342	867	5	5,656	10,690
Sparkes Hill	2,611	598	1,342	867	5	5,423	10,249
Stretton	2,015	598	1,342	867	5	4,827	9,123
Tarragindi	3,670	598	1,342	867	5	6,482	12,251
The Gap	3,118	598	1,342	867	5	5,930	11,208
Wellers Hill	1,353	598	1,342	867	5	4,165	7,872

* $/ET = (ICU/ET) x current value of an ICU (2010/11), refer section 1.
= (ICU/ET) x $1.89

Table A3.2 Brisbane – Eagle Farm Sewerage Catchment Infrastructure Contributions

Sub-Catchment	Treatment* Infrastructure Contribution (ICUs/ET)	Transport Infrastructure Contribution (ICUs/ET)	Preparation Charge (ICUs/ET)	Total Infrastructure Contribution (ICUs/ET)	Actual Rate $2010/11 ($/ET)**
ATC	1,511	4,432	5.2	5,948	11,242
BAC	1,511	1,242	5.2	2,758	5,213
BFST1	1,511	8,602	5.2	10,118	19,123
CITY1	1,511	5,223	5.2	6,739	12,737
DNFL1	1,511	6,316	5.2	7,832	14,802
EFPS1	1,511	6,779	5.2	8,295	15,678
HAMN1	1,511	5,290	5.2	6,806	12,863
HOCK1	1,511	7,924	5.2	9,440	17,842
NDGE2	20,392	3,827	5.2	24,224	45,783
NKBE1	1,511	9,070	5.2	10,586	20,008
NKBE2	1,511	2,372	5.2	3,888	7,348
NKBW3	1,511	8,722	5.2	10,238	19,350
NORM1	1,511	8,894	5.2	10,410	19,675
PRSC	1,511	5,179	5.2	6,695	12,654
SKBK1	1,511	5,047	5.2	6,563	12,404
TWNG1	1,511	7,290	5.2	8,806	16,643

* excludes subsidies
** $/ET = (ICU/ET) x current value of an ICU (2010/11), refer section 1.
= (ICU/ET) x $1.89

Table A3.3 Brisbane S2 and S6 – Oxley, Fairfield and Wacol Sewerage Catchment Infrastructure Contributions

Sub-Catchment	Treatment* Infrastructure Contribution (ICUs/ET)	Transport Infrastructure Contribution (ICUs/ET)	Preparation Charge (ICUs/ET)	Total Infrastructure Contribution (ICUs/ET)	Actual Rate $2010/11 ($/ET)***
ARGE01 ^	1,649	4,151	5.2	5,805	10,971
BLDR03	1,601	4,023	5.2	5,629	10,639
CNDA06	1,601	3,748	5.2	5,354	10,119
DOOL01	1,601	2722	5.2	4,328	8,180
FFLD06**	3,434	4,745	5.2	8,184	15,468
FTSE01	1,601	6,261	5.2	7,867	14,869
INLA01	1,601	3,403	5.2	5,009	9,467
JMND02	1,601	6,525	5.2	8,131	15,368
JMND05	1,601	3,685	5.2	5,291	10,000
JMND10	1,601	9,487	5.2	11,093	20,966
KROO02^	1,649	3,605	5.2	5,259	9,940
KROO04^	1,649	5,444	5.2	7,098	13,415
KROO05^	1,649	5,691	5.2	7,345	13,882
MLBN01	1,601	3,005	5.2	4,611	8,715
MLBN02	1,601	2,396	5.2	4,002	7,564
MOGL01 ^	1,649	4,615	5.2	6,269	11,848
MTOM01 ^	1,649	3,558	5.2	5,212	9,851
OFLD02	1,601	4,421	5.2	6,027	11,391
OFLD03	1,601	3,526	5.2	5,132	9,699
OFLD04	1,601	1,694	5.2	3,300	6,237
OXDA02^	1,601	3,336	5.2	4,942	9,340
OXLY01	1,601	3,351	5.2	4,957	9,369
OXLY02	1,601	3,584	5.2	5,190	9,809
OXLY03	1,601	5,263	5.2	6,869	12,982
OXLY04	1,601	5,437	5.2	7,043	13,311
PENG01 ^	1,649	3,843	5.2	5,497	10,389
PGRS02^	1,649	4,093	5.2	5,747	10,862
SMNR01 ^	1,649	8,971	5.2	10,625	20,081
SNDA01 ^	1,649	4,043	5.2	5,697	10,767
SNDA02^	1,649	3,339	5.2	4,993	9,437
SNDA07^	1,649	3,528	5.2	5,182	9,794
SNDA09^	1,649	4,126	5.2	5,780	10,924
STAB02	1,601	2,554	5.2	4,160	7,862
STAB03	1,601	3,864	5.2	5,470	10,338
WEKS01 ^	1,649	3,040	5.2	4,694	8,872
WITN05	1,601	5,781	5.2	7,387	13,961

*excludes subsidies
**Fairfield treatment Contribution applies
^ Wacol treatment Contribution applies
*** $/ET = (ICU/ET) x current value of an ICU (2010/11), refer section 1.
= (ICU/ET) x $1.89

Table A3.4 Brisbane S3 – Gibson Island Sewerage Catchment Infrastructure Contributions

Sub-Catchment	Treatment* Infrastructure Contribution (ICUs/ET)	Transport Infrastructure Contribution (ICUs/ET)	Preparation Charge (ICUs/ET)	Total Infrastructure Contribution (ICUs/ET)	Actual Rate $2010/11 ($/ET)**
CRNA04	1,317	2,068	5.2	3,390	6,407
EARM01	1,317	4,881	5.2	6,203	11,724
GOWN01	1,317	8,402	5.2	9,724	18,378
GOWN03	1,317	5,240	5.2	6,562	12,402
GOWN04	1,317	5,468	5.2	6,790	12,833
GOWN05	1,317	5,855	5.2	7,177	13,565
KNWA01	1,317	3,330	5.2	4,652	8,792
KNWA03	1,317	5,123	5.2	6,445	12,181
PHLP01	1,317	3,368	5.2	4,690	8,864
QPRT01	1,317	3,583	5.2	4,905	9,270
QPRT02	1,317	3,794	5.2	5,116	9,669
SYBK03	1,317	4,462	5.2	5,784	10,932
TGPA07	1,317	4,561	5.2	5,883	11,119
UDWD03	1,317	6,300	5.2	7,622	14,406
UDWD05	1,317	10,244	5.2	11,566	21,860
WKLY01	1,317	3,713	5.2	5,035	9,516
WKLY02	1,317	7,438	5.2	8,760	16,556
WKLY04	1,317	35,544	5.2	36,866	69,677

* excludes subsidies
** $/ET = (ICU/ET) x current value of an ICU (2010/11), refer section 1.
= (ICU/ET) x $1.89

Table A3.5 Brisbane S4 – Wynnum Sewerage Catchment Infrastructure Contributions

Sub-Catchment	Treatment* Infrastructure Contribution (ICUs/ET)	Transport Infrastructure Contribution (ICUs/ET)	Preparation Charge (ICUs/ET)	Total Infrastructure Contribution (ICUs/ET)	Actual Rate $2010/11 ($/ET)**
ADMS01	3,234	4,438	5.2	7,677	14,510
HNDS01	3,234	11,930	5.2	15,169	28,669
SNDY01	3,234	11,512	5.2	14,751	27,879

* excludes subsidies
** $/ET = (ICU/ET) x current value of an ICU (2010/11), refer section 1.
= (ICU/ET) x $1.89

Table A3.6 Brisbane S5 – Sandgate Sewerage Catchment Infrastructure Contributions

Sub-Catchment	Treatment* Infrastructure Contribution (ICUs/ET)	Transport Infrastructure Contribution (ICUs/ET)	Preparation Charge (ICUs/ET)	Total Infrastructure Contribution (ICUs/ET)	Actual Rate $2010/11 ($/ET)**
ASPE01	1,549	5,094	5.2	6,648	12,565
BNDL03	1,549	6,825	5.2	8,379	15,836
BNPS03	1,549	5,880	5.2	7,434	14,050
BNPS05	1,549	5,315	5.2	6,869	12,982
CDNE02	1,549	3,348	5.2	4,902	9,265
DEPT03	1,549	2,027	5.2	3,581	6,768
PKNS01	1,549	3,155	5.2	4,709	8,900
STTN01	1,549	4,578	5.2	6,132	11,589
TSND03	1,549	5,360	5.2	6,914	13,067

*excludes subsidies
** $/ET = (ICU/ET) x current value of an ICU (2010/11), refer section 1.
= (ICU/ET) x $1.89

Table A3.7 Brisbane S7 – Karana Downs Sewerage Catchment Infrastructure Contributions

Sub-Catchment	Treatment* Infrastructure Contribution (ICUs/ET)	Transport Infrastructure Contribution (ICUs/ET)	Preparation Charge (ICUs/ET)	Total Infrastructure Contribution (ICUs/ET)	Actual Rate $2010/11 ($/ET)**
KRNA01	9,242	11,151	5.2	20,398	38,552

*excludes subsidies
** $/ET = (ICU/ET) x current value of an ICU (2010/11), refer section 1.
= (ICU/ET) x $1.89

Table A3.8 Brisbane – Rochedale (High Growth) Water Supply Infrastructure Contributions

Contribution Area	Infrastructure Contributions (ICUs/ET)					Actual Rate $2010/11 ($/ET)*
	Local Distribution	Retail Shared/Bulk Distribution System	Treatment	Preparation Charge	Total Contribution	
Rochedale 1	727	734	207	5	1,673	2,911
Rochedale 2	914	734	207	5	1,860	3,236
Rochedale 3	865	734	207	5	1,811	3,151

* $/ET = (ICU/ET) x current value of an ICU (2010/11), refer section 1.
= (ICU/ET) x $1.74

Table A3.9 Brisbane – Rochedale (High Growth) Non-Drinking Water Supply Infrastructure Contributions

Sub-Catchment	Distribution System (ICUs/ET)	Groundwater Extraction System (ICUs/ET)	Excess NDW Discharge System (ICUs/ET)	Preparation Charge (ICUs/ET)	Total Infrastructure Contribution (ICUs/ET)	Actual Rate $2010/11 ($/ET)
RDLE-NDW	2,068	168	62	5	2,302	4,005

* $/ET = (ICU/ET) x current value of an ICU (2010/11), refer section 1.
= (ICU/ET) x $1.74

Table A3.10 Brisbane – Rochedale (High Growth) Sewerage Infrastructure Contributions

Contribution Area	Treatment Infrastructure Contribution (ICUs/ET)	Transport Infrastructure Contribution (ICUs/ET)	Preparation Charge (ICUs/ET)	Total Infrastructure Contribution (ICUs/ET)	Actual Rate $2010/11 ($/ET)*
RDLE01	1,577	1,231	5	2,813	4,895
RDLE02	1,475	2,425	5	3,905	6,795

* $/ET = (ICU/ET) x current value of an ICU (2010/11), refer section 1.
= (ICU/ET) x $1.74

Table A3.11 Ipswich Water Supply Infrastructure Charges

Charge Area	Infrastructure Charge Residential (Rate/EP)	Infrastructure Charge Non-Residential (Rate/NRU)	Actual Charge Residential $2010/11 ($/EP)*	Actual Charge Non-Residential $2010/11 ($/NRU)
Blackstone High Level Zone	1,445	1,734	1,694	2,033
Borallon	1,212	1,454	1,421	1,705
Brassall High Level Zone	965	1,158	1,131	1,358
Brassall Low Level Zone	1,120	1,344	1,313	1,576
Bundamba Low Level Zone	612	734	718	861
Bundamba South High Level Zone	373	448	437	525
Camira	1,036	1,243	1,215	1,457
Denmark Hill High Level Zone	677	813	794	953
Denmark Hill Low Level Zone	615	739	721	866
Ebenezer High Level Zone	1,140	1,367	1,337	1,603
Ebenezer Low Level Zone	870	1,044	1,020	1,224
Goodna	526	631	617	740
Haigslea	1,778	2,133	2,085	2,501
Karragaroo Blackstone	1,198	1,438	1,405	1,686
Karragaroo High Level Zone	1,101	1,321	1,291	1,549
Malabar Road	2,249	2,699	2,637	3,164
Marburg High Level Zone	2,015	2,418	2,362	2,835
Marburg	1,958	2,350	2,296	2,755
Peak Crossing	4,633	5,560	5,432	6,519
Redbank Plains High Level Zone	1,249	1,498	1,464	1,756
Redbank Plains Low Level Zone	972	1,166	1,140	1,367
Ripley High Level Zone	1,309	1,571	1,535	1,842
Ripley Low Level Zone	1,150	1,380	1,348	1,618
Riverview High Level Zone	399	479	468	562
Rosewood (Stirling Road) High Level Zone	969	1,163	1,136	1,363
Rosewood High Level Zone	1,028	1,233	1,205	1,446
Rosewood Low Level Zone	1,105	1,326	1,296	1,555
Springfield High Level Zone	675	810	791	950
Springfield Low Level Zone	601	721	705	845
Tivoli Chuwar Karalee	954	1,145	1,118	1,342
Tivoli High Level Zone	183	220	215	257
Walloon	870	1,044	1,020	1,224
Western - Karrabin	446	535	523	627
Western - Muirlea	5,217	6,261	6,116	7,340

* $/EP = (Rate/EP) x unit charge multiplier (2010/11), refer section 2.
= (Rate/EP) x 1.1724 (same as for $/NRV)

Table A3.12 Ipswich Sewerage Infrastructure Charges

Charge Area	Infrastructure Charge Residential (Rate/EP)	Infrastructure Charge Non-Residential (Rate/NRU)	Actual Charge Residential $2010/11 ($/EP)*	Actual Charge Non-Residential $2010/11 ($/NRU)
SP1	1,768	2,053	2,073	2,407
SP2	1,679	1,964	1,969	2,303
Berry St	1,803	2,088	2,114	2,448
SP3	1,221	1,506	1,432	1,766
SP3-RV	1,749	2,034	2,051	2,385
SP4	2,896	3,181	3,396	3,730
SP5	925	1,210	1,085	1,419
SP8	5,364	5,649	6,289	6,623
SP11	1,267	1,552	1,486	1,820
SP12	1,479	1,764	1,734	2,069
SP14	3,767	4,052	4,417	4,751
SP15	4,568	4,853	5,356	5,690
SP16	1,586	1,871	1,860	2,194
SP16-DC	2,063	2,348	2,419	2,753
SP17	1,305	1,590	1,530	1,865
SP18	1,243	1,528	1,458	1,792
SP19	1,845	2,130	2,163	2,498
SP20	2,198	2,483	2,577	2,912
SP21	1,422	1,707	1,667	2,002
SP22	5,662	5,947	6,638	6,973
Suffield	4,130	4,415	4,842	5,177
South West Bundamba	4,305	4,590	5,047	5,382
South Bremer	767	1,052	900	1,234
SP48	1,145	1,430	1,343	1,677
SP49	923	1,208	1,082	1,417
SP50	1,257	1,542	1,474	1,808
SP51	2,364	2,649	2,772	3,106
SP52	1,371	1,656	1,608	1,942
SP53	1,289	1,574	1,512	1,846
SP54	1,507	1,792	1,767	2,101
SP55	1,383	1,668	1,622	1,956
SP56	893	1,178	1,047	1,382
SP57	1,184	1,469	1,388	1,723
SP58	1,060	1,345	1,243	1,577
SP60	3,252	3,537	3,813	4,147
SP61	6,166	6,451	7,229	7,564
SP62	892	1,177	1,046	1,380
SP63	4,574	4,859	5,363	5,697
SP64	5,314	5,599	6,230	6,565

Table A3.12 Ipswich Sewerage Infrastructure Charges (cont)

Charge Area	Infrastructure Charge Residential (Rate/EP)	Infrastructure Charge Non-Residential (Rate/NRU)	Actual Charge Residential $2010/11 ($/EP)*	Actual Charge Non-Residential $2010/11 ($/NRU)
SP65	7,343	7,628	8,609	8,943
Tivoli Business (excluding internal)	769	1,054	902	1,236
Wulkuraka	1,802	2,087	2,113	2,447
North Booval	1,021	1,306	1,197	1,532
Karalee	2,420	2,705	2,838	3,172
Carole Park/SP23	1,540	1,875	1,805	2,198
SP27	1,392	1,727	1,632	2,025
SP28 (excl Springfield)	1,458	1,793	1,709	2,102
SP31	1,820	2,155	2,134	2,527
SP32	1,748	2,083	2,049	2,442
SP33/SP37	1,200	1,535	1,407	1,800
SP34	1,455	1,790	1,706	2,099
SP35	964	1,299	1,130	1,523
SP36	1,060	1,395	1,243	1,636
Rosewood	1,396	1,686	1,636	1,977
Walloon Thagoona	1,209	1,508	1,417	1,768
Ebenezer	999	1,166	1,171	1,367
Springfield	1,094	1,429	1,283	1,675

* $/EP = (Rate/EP) x unit charge multiplier (2010/11), refer section 2.
= (Rate/EP) x 1.1724 (same as for $/NRV)

Table A3.13 Lockyer Valley Water Supply Infrastructure Charges

Charge Area	Infrastructure Charge $2010/11
Gatton Planning Scheme Area	
Gatton – full pressure	4,325
Gatton Constant Flow	4,120
Placid Hills	4,325
Grantham	4,325
Helidon	4,325
Postman's Ridge	4,325
Withcott	4,325
Table Top	4,325
Woodlands Rise Development Area	5,160
All areas – Existing Property contributing to infrastructure	1,750
Laidley Planning Scheme Area	
Glenore Grove East to Laidley – Esk Shire Boundary	1,200
Glenore Grove West to Laidley – Gatton Boundary	1,600
Glenore Grove to Laidley Town – North of Warrego Highway	1,450
Glenore Grove to Laidley Town – South of Warrego Highway	2,050
West Laidley Region	2,600
QM Properties Region	1,890
Laidley Town	3,500
Forest Hill Town	1,470

Table A3.14 Lockyer Valley Sewerage Infrastructure Charges

Charge Area	Infrastructure Charge $2010/11
Gatton Planning Scheme Area	
Gatton	1,800
Helidon	1,800
Woodlands Rise Development Area	2,780
Laidley Planning Scheme Area	
Laidley Town	1,200
Forest Hill Town	1,200

Table A3.15 Scenic Rim Water Supply Infrastructure Charges

Charge Area	Infrastructure Charges $2010/11 ($/ET)		
	SEQ Water Bulk Supply	Queensland Urban Utilities	Total Infrastructure Charge
Beaudesert	1,982	4,876	6,858
Boonah	1,303	2,446	3,749
Ipswich – Residential Rate	N/A	5,281	5,281
Ipswich – Non Residential Rate	N/A	6,338	6,338

Table A3.16 Scenic Rim Sewerage Infrastructure Charges

Charge Area	Infrastructure Charge $2010/11 ($/ET)
Beaudesert	5,228
Boonah	3,136
Ipswich	N/A

Table A3.17 Somerset Water Supply Infrastructure Charges

Charge Area	Infrastructure Charge $2010/11
Linville	3,043
Kilcoy and Jimna	6,478
Somerset Dam	3,793
Toogoolawah	3,043
Esk	3,043
Fernvale	3,390
Lowood	3,586
Lowood to Litzows Road (excluding blocks fronting Litzows Road)	3,586
Litzows Road to Zabels Road (including all blocks fronting Litzows Road and excluding blocks fronting Zabels Road)	4,271
Zabels Road to Minden (including all blocks fronting Zabels Road)	4,543
Elsewhere off Lowood-Minden main (including Lyons Bridge to Mt Tarampa)	4,543

Table A3.18 Somerset Sewerage Infrastructure Charges

Charge Area	Infrastructure Charge $2010/11
Toogoolawah	3,043
Kilcoy	5,651
Esk	3,043
Fernvale	3,793
Lowood	3,793

ANNEX 4: COMPETITION ECONOMICS GROUP REPORT

Estimating the cost of capital for Queensland Water Distribution Retailers

July 2010

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Competition Economists Group
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1. Introduction

1. The Queensland water distributor/retailers businesses (DRs) have asked CEG to advise them on an appropriate methodology for estimating the cost of capital for their regulated operations. We understand that the nature of that regulation is still evolving but that it will initially involve price monitoring by the Queensland Competition Authority (QCA). We understand that this may evolve into formal price setting/approval regulatory framework in the future – similar to that which operates for other regulated energy and water distribution businesses in Australia.

2. The structure of this report is as follows

   - Section 2 provides a summary of our recommendations and a description of the weighted average cost of capital (WACC) that is derived from application of this methodology;
   - Section 3 describes the benchmark capital financing structure that we propose be adopted. This capital financing structure then informs what how the cost of equity and debt are consistently estimated;
   - Section 4 describes our analysis on the cost of equity, including a discussion of the relative risk of water distributors and other natural monopoly businesses (such as energy distribution businesses);
   - Section 5 describes our analysis in relation to estimating the cost of debt;
   - Section 6 describes our analysis in relation to estimating the cost of tax and, specifically, the value of imputation credits;
   - Appendices A and B deal with respectively the interpretation of proxy equity betas estimated from stock market data and the estimation of the cost of debt.

2. Estimate of the weighted average cost of capital

3. The following sections of this report provide advice on which methodology we believe should be used to estimate the weighted average cost of capital, and why we reach this conclusion. However, in this section, we simply summarise the methodology and provide the results associated with its application.

4. In summary, we estimate the benchmark capital structure for the Queensland distribution retailers (DRs) to involve a 60% gearing level and the issuance of 10 year debt with a credit rating of BBB+.

2.1. Recommended WACC estimate

5. In the below discussion we use market data from the period 24 May 2010 to 3 June 2010 to reflect prevailing conditions. The cost of equity is estimated using the Sharpe CAPM formula:

$$R_e = R_f + \beta_e \cdot (R_m - R_f)$$

where: R_f is the risk free rate and is proxied by the prevailing yield on 10 year nominal Commonwealth Government Securities (CGS) sourced from the Reserve Bank of Australia (RBA) website ;

β_e is the equity beta and is set using a range of 0.8 to 1.0; and

$(R_m - R_f)$ is the expected market risk premium (MRP) and is set at a value of 6.5%.

6. However, in a departure from Australian regulatory practice (although not US and UK regulatory practice) we do not only have regard to the prevailing interest rates immediately before the regulatory period when setting the risk free rate and the cost of debt.

7. We recommend that the cost of debt is estimated at 8.80% which reflects an equal weighting given to the average cost of debt over the last five years and the cost of debt during the currently prevailing cost of debt (during the period 7 May 2010 to 3 June 2010). This gives rise to a lower cost of debt than if the prevailing cost of debt (9.30%) alone is used to set the cost of debt.

8. This benchmark assumption is adopted on the basis that the compensation for the cost of debt should reflect the actual cost of debt during the coming regulatory period for a benchmark prudent debt financing in strategy. In our view, a prudent debt financing

strategy will involve the refinancing of approximately one tenth of the businesses debt each year with the issue of new 10 year bonds. Over the regulatory period the regulated business will be paying interest on debt that was prudently issued in the past and will also be paying interest on newly issued debt during the regulatory period. The proposed method for estimating the cost of debt proxies this by giving weight to both the recent past cost of debt and the prevailing cost of debt. This also protects businesses and consumers from having prices set based on a cost of debt during a short averaging period that simply does not reflect the average cost of debt a firm with a prudent refinancing strategy would face.

9. The cost of debt is estimated assuming the issuance of 10 year debt at a yield equal to the average of CBASpectrum BBB+ 10 year fair value and Bloomberg BBB 10 year fair value.[1] These yields are annualised from the raw data which is expressed in semi-annual terms.

10. The risk free rate is set based on the average yield on 10 year CGS over the last five years (5.65%) rather than the prevailing risk free rate (5.43%). We adopt this assumption in order to ensure that the cost of equity is not inappropriately and perversely affected by changing risk tolerance. Specifically, it is well understood that in an economic crisis the MRP and the risk free rate move in opposite directions – with the MRP increasing by more than the risk free rate falls. Consequently, if one adopts a MRP that is heavily influenced by historical averages rather than forward looking rates then the methodology will fail to pick up increases in the MRP. However, if the methodology always uses the prevailing risk free rate then it will pick up falls in the risk free rate as investors 'rush to safety'.

11. This gives rise to the perverse outcome that, in the midst of a crisis, the methodology will estimate a historically low cost of equity when, in reality, the cost of equity is historically high. Precisely this occurred in the 2009 NSW electricity decisions where the AER set the cost of equity at historically low levels in the midst of the GFC. This outcome was successfully appealed by the NSW businesses to the ACT. The methodology proposed in this report would not have had that effect.

12. We report two reasonable methods for estimating expected inflation. In the Gladstone Area Water Board draft decision (March 2010), the QCA estimates expected inflation to be 2.5% pa based on the mid-point of the RBA target inflation range. Alternatively, expected 10 year inflation is estimated by taking the average of the latest RBA forecast out to two years and assuming inflation is 2.5% on average over the remaining 8 years. We estimate, using this method, the average expected inflation rate to be 2.57% over the last five years. This estimate will, unsurprisingly and appropriately in normal circumstances, always give an estimate that is heavily weighted to the middle of the RBA target range (as is the QCA method). These

[1] Where the Bloomberg 10 year cost of debt is estimated as the Bloomberg 7 year BBB fair value yield plus the difference between the Bloomberg AAA fair value yields at 10 and 7 years maturity. This estimation is necessary given that Bloomberg does not currently report a 10 year BBB fair value directly.

inflation estimates are used to derive a range for the real risk free rate (using the Fisher transformation).

13. The resulting estimated cost of capital is summarised in the below table.

Table 1: WACC parameters

Parameter	Value
Gearing	60%
Nominal risk free rate	5.65%
Expected inflation	2.50% to 2.57%
Real risk free rate	3.07% to 3.00%
Equity beta	0.8 to 1.0
Market risk premium	6.50%
Nominal return on equity	10.85% to 12.153%
Cost of debt	8.80%
Nominal vanilla WACC*	9.62% to 10.14%

Source: Bloomberg, CBASpectrum, RBA and CEG analysis.
**The nominal vanilla WACC is an estimate of the required return on capital of investors after the cost of company tax has already been paid by the corporation.*

2.2. Alternative WACC estimate only prevailing interest rates

14. Table 1 presents the outcomes of the analysis if the cost of debt is instead using market interest rates in the period 7 May 2010 to 3 June 2010 to set the risk free rate and cost of debt.

Table 2: WACC parameters based on prevailing data

Parameter	Value
Gearing	60%
Nominal risk free rate	5.43%
Inflation	2.50% to 2.63%
Real risk free rate	2.86% to 2.73%
Equity beta	0.8 to 1.0
Market risk premium	6.50%
Nominal return on equity	10.63% to 11.93%
Cost of debt	9.30%
Nominal vanilla WACC*	9.83% to 10.35%

Source: Bloomberg, CBASpectrum, RBA and CEG analysis.
**The nominal vanilla WACC is an estimate of the required return on capital of investors after the cost of company tax has already been paid by the corporation.*

15. It can be seen that adopting a longer averaging period lowers the estimated nominal WACC marginally but not significantly. The risk free rate rises by around 20bp when a longer history is used but this is more than offset by the cost of debt falling by around 50bp.

3. Financial structure

16. Notwithstanding the QCA's assumption that assumed gearing for the Gladstone Area Water Board shuld be 50%, it has become entrenched regulatory precedent in other states and industries Australia to assume that a regulated utility is financed with 60% debt where the average maturity of that debt is 10 years giving rise to a credit rating of BBB+. This is standard practice for gas and electricity businesses and is also adopted by IPART and the Victorian ESC for water businesses.

17. It is our view that the Queensland DR's should also adopt a 60% gearing assumption. This conclusion is based on three considerations:

    i. Adopting the same assumptions allows for greater ease of comparison, and the ability to have regard to the parameter estimates used by other regulators. For example, the equity beta and credit rating assumed by the Queensland DR's will only be comparable to the equity beta and credit rating adopted by other regulators if the gearing capital structure is the same;

    ii. Regulatory precedent has been established having regard to the actual financing structure of privately owned infrastructure businesses. In particular, privately owned gas and electricity distribution businesses that have similar levels of sunk assets, similar cost structures and similar regulatory arrangements to the Queensland DRs;

    iii. The choice of capital structure should not have a material impact on the weighted average cost of capital. This is consistent with the findings of Modigliani and Miller (1958)[2] which we discuss in more detail below.

Key conclusion – capital structure

The DRs should set the cost of capital based on an assumed 60% debt gearing assumption and a 10 year debt issuance assumption.

3.1. 10 versus 5 year debt issuance

18. One issue that has recently been revisited by a number of regulators, including the QCA, is whether the cost of debt should be set based on an assumed issuance of 5 year debt rather than 10 year debt.

19. Issuing 5 year debt will, in most circumstances, lead to a lower interest rate cost for a business than issuing 10 year debt. Therefore, looked at in isolation it may appear that assuming firms issue 10 year debt results in them being allocated a higher interest cost than is efficient (ie, not the lowest interest rate cost available to the firm).

[2] Modigliani, F.; Miller, M. (1958). "The Cost of Capital, Corporation Finance and the Theory of Investment". *American Economic Review* **48** (3): 261–297.

3.1.1. Modigliani-Miller in frictionless financial markets

20. However, this logic is naïve and fails to properly take account of the interrelationship between the maturity structure of the debt issued by a company and the cost of equity. As first described by the Nobel Prize winning finance academics, Modigliani and Miller (1958), changes in the financing structure, including the debt maturity profile, will alter the cost of equity in an offsetting fashion.

21. It may well be the case that by assuming the DRs issue five year instead of ten year bonds, the estimated cost of debt for the DRs will be reduced because interest costs on five year bonds are lower than interest costs of 10 year bonds. This, in itself, is not necessarily an error. The error exists if one the fails to analyse what this implies about the cost of equity.

22. Modigliani and Miller (1958) demonstrated that the level of risk in a firm is like the amount of air in a balloon. If one squeezes risk out of one area (eg, debt) then the risk simply moves to another (ie, equity). Issuing short-term debt may lower the cost of debt but it does so precisely because it lowers the amount of risk that debt providers have to bear. The corollary of this, however, is that the equity providers have to bear higher risk (ie, the risk that was previously passed onto debt providers is now retained in the business for equity holders).

23. Miller, 33 years after his seminal paper with Modigliani has used a similar analogy. Miller (1991) states:[3]

> *Think of the firm as a gigantic tub of whole milk. The farmer can sell the whole milk as it is. Or he can separate out the cream, and sell it at a considerably higher price than the whole milk would bring. (Selling cream is the analog of a firm selling debt securities, which pay a contractual return.) But, of course, what the farmer would have left would be skim milk, with low butter-fat content, and that would sell for much less than whole milk. (Skim milk corresponds to the levered equity.) The Modigliani-Miller proposition says that if there were no cost of separation (and, of course, no government dairy support program), the cream plus the skim milk would bring the same price as the whole milk.*

24. In this quote Miller notes that issuing low risk debt securities is analogous to a farmer separating out cream from whole milk. The firm gets a good price (low interest rate) for its debt but the corollary is that the equity it is left with is less desirable (requires a higher return to attract investors). This is similar to a farmer starting with whole milk and separating out the cream (for which the farmer gets a high price) but the milk the farmer is left with is skim milk and worth less per unit.

[3] Miller (1991) *Financial Innovations and Market Volatility*, p. 269

25. Assuming efficient financial markets and zero transaction costs (as are assumed in the derivation of the CAPM model) Modigliani and Miller demonstrated that the net effect on the weighted average cost of capital will be zero – with the higher cost of equity offsetting the lower cost of debt. Modigliani and Miller effectively described the "law of the conservation of risk" that has its corollary the physical sciences in the "law of conservation of energy".

26. A further conclusion that flowed from Modigliani and Miller was that, if financial markets are perfectly efficient with zero transaction costs, then no debt raising strategy will dominate any other debt raising strategy. All strategies, from issuing very short-term debt to issuing very long term debt, will result in the same weighted average cost of capital (WACC). This means, other things equal, if one were to assume a benchmark regulated utility issued 5 year debt then such a utility would need to have a higher cost of equity than is assumed for a benchmark regulated utility issuing 10 year debt.

27. When similar analysis was put before the AER the AER accepted that it would be incorrect to simply assume that firms could issue 5 year debt at a lower interest rate cost without simultaneously increasing the cost of equity. The below quote from the AER Final Decision provides a summary of its considerations on the Modigliani and Miller conclusions.

> *The JIA's consultant CEG argues that a focus on the cost of debt in setting the term of the risk-free rate is inappropriate as it violates a fundamental principle of asset pricing theory – that the value of an asset is determined independently of the way in which it is funded. CEG states that:*
>
> > *…one gains the impression that the AER believes that it is efficient to issue short term debt (which has lower interest rates) provided that the transaction costs of issuing short term debt are not higher by an offsetting amount.*
> >
> > *We do not agree with this. The principle of conservation of risk suggests that any lower interest rates available from issuing short term debt will be fully offset by a higher cost of equity – this is known as the Modigliani-Miller theorem.*
>
> *In the AER's view, CEG correctly observes that the impact of current debt financing practices on interest rate risk should already be reflected in empirical equity beta estimates.* [4]

[4] AER, May 2009, Final Decision, *Electricity transmission and distribution network service providers. Review of the weighted average cost of capital (WACC) parameters* Page 149

28. The AER goes onto state that their intention was only to estimate the cost of debt based on what businesses actually do. Having been convinced that businesses actually do issue 10 year debt (see below) the AER concluded that it would set the cost of debt based on what businesses actually do.

3.1.2. Modigliani-Miller financial markets with frictions

29. On the basis of the Modigliani-Miller theorem then, in frictionless financial markets, capital structure simply does not matter. As a result, we would expect to see very similar firms having a great variety of capital structures (some with short term debt and some with long term debt, some with high gearing and others with low gearing etc).

30. By contrast, if we observe that, in the real world, there is a dominant debt raising strategy, such as issuing long term debt, then Modigliani and Miller demonstrated that this must be because transaction costs are positive (financial markets are less than perfect). If we observe a dominant strategy of issuing long-term debt then this must be because there are advantages to issuing long term debt, such as lessening exposure to refinance risk and potential insolvency and bankruptcy transaction costs.

31. These advantages must *more than fully* offset the advantages of gaining a lower interest rate by issuing short-term debt. That is, if issuing long-term debt is a dominant strategy for particular kinds of businesses then it must be the case that issuing short-term debt not only does not reduce the WACC but actually raises the WACC (ie, is less efficient than issuing long-term debt). That is, it must be that the cost of equity increases by more than the cost of debt reduces when short-term debt is issued – otherwise long term debt issuance would not be the dominant observed debt issuance strategy.

32. This suggests that it is important to look at what businesses actually do. When we do this we conclude that businesses with long lived sunk assets of the nature of the DRs have a very strong tendency to issue ten year (or longer) debt

33. An important conclusion of this report is that that long-lived infrastructure businesses, including regulated businesses, near universally issue debt with a maturity of 10 years or greater.

3.1.3. What do firms actually do

34. Based on a Deloitte report to the AER CEG has previously estimated that the average term to maturity of *outstanding* debt (as opposed to maturity at issuance) issued by private regulated energy businesses was around 6 years.[5] Deloitte derived the underlying data from financial statements of the businesses. Table 2 from that report is reproduced below:

[5] CEG, *Term of the risk free rate under the NER*, January 2009.

Table 3: Estimate of the weighted average remaining time to maturity

Time to maturity	Total debt* ($m)	Percentage of total debt	CEG point estimate (years)	Weighted average
Less than 1 year	2,651	13%	0.5	
1 to 5 years	8,868	44%	3	
More than 5 years	8,812	43%	11	
Sum	**20,331**	**100%**		**6 years**

Source: Deloitte and CEG analysis

35. However this needs to be doubled to provide an estimate of the average time to maturity of debt at the time of issuance – noting that, on average, outstanding debt will tend to be half way through its life.

36. CEG were also provided with the following data from the Joint Industry Associations (JIA) that corroborates this conclusion. We are informed that these figures have been reconciled to the 2007 statutory accounts.

Table 4: JIA estimate of the average time to maturity

Distribution Business	Ownership	Amount	Average Term to maturity	Average term at issuance
CitiPower & Powercor	Private	2,532.0	5.65	10.40
ETSA utilities	Private	2,353.5	7.11	10.81
SPAusnet	Private	3,662.8	4.47	7.27
Envestra	Private	1,960.9	10.91	14.39
Average	**20,331**	**100%**	**6.55**	**10.14**

Source: JIA

37. The AER inspected these audited accounts and concluded:[6]

> *Taking into account this new information, the AER has verified that the weighted average maturity of debt portfolios at the time of issuance for these businesses is 10.14 years as presented above in table 6.1. That is, the further information confirms that these businesses refinance on average every 10 years.*

3.1.4. Regulated utilities internationally

38. We have also examined a large database of all outstanding bonds listed on Bloomberg and classified as being issued by a "utility" (being gas electricity or water transport

[6] AER, May 2009, Final Decision, *Electricity transmission and distribution network service providers. Review of the weighted average cost of capital (WACC) parameters*, p. 159

company). Many if not most of these firms will be regulated in a similar fashion to Australian regulated business – including with regular price resets every five or so years. The results of this analysis are reported in the below table.

Table 5: Debt issues by utilities internationally

	Amount (bn)	Unweighted average term to maturity at issuance	Weighted average term to maturity at issuance
Utility by sector			
Water	Na	18	na
Gas transmission	Na	10	na
Gas Distribution	Na	12	na
Electricity integrated	na	12	na
Electricity transmission only	na	12	na
Electricity distribution only	na	13	na
All	na	12	na
Utility by currency of issue			
US dollar	476.7	15	14
Euro	161.4	10	9
Canadian dollar	36.4	19	22
Australian dollar	6.4	10	11
British pound	51.5	29	24
Japanese yen	11,467.9	10	11

Source: Bloomberg and CEG analysis

39. Based on the figures in this table, all utility sectors tended to issue debt with a maturity of 10 years or higher. The lowest was gas transmission which had an unweighted average maturity of 10 years. The highest was for the Water utilities which had an unweighted average maturity of 18 years.

40. It was not possible to easily calculate a weighted average for sector specific categories because the bonds are issued in a range of currencies (48 currencies in total).[7]

41. However, Bloomberg also allows one to classify bonds issued by utilities by the currency in which they have been issued. In that case it is possible to calculate a meaningful weighted average and these are reported in the table. The weighted average maturity of bonds issued in US dollars is 14 years. The lowest weighted average maturity is 9 years for bonds issued in Euros. The highest weighted average maturity is 29 years for bonds issued in British pounds.

[7] In order to calculate a meaningful weighted average maturity it would be necessary to convert each of the outstanding amounts for each bond into a common currency. It is not obvious what exchange rate (eg, nominal or purchasing power parity) should be used in this context and what date should be used (eg, current or time of issue).

42. It should be noted that this does not mean that European companies tend to issue 9 year bonds and British companies tend to issue 29 year bonds. Rather, it is more likely that European companies tend to issue their long term debt in British pounds (eg, because the demand for long term corporate debt is highest in Britain).

43. This data strongly confirms the Australian data that regulated utilities, with long lived assets, have a strong preference for issuing long term debt.

Key conclusion – 5 vs 10 year debt

The overwhelming evidence is that regulated utilities issue debt that, on average, has at least a 10 year maturity. Consistent with this and consistent with the work of Modigliani and Miller it would be inappropriate to estimate the cost of capital assuming that they issued 5 year debt. However, if one were to do so one would have to raise estimates of the cost of equity and other transaction costs by a more than offsetting amount. That is, the cost of equity would be higher if a regulated utility was assumed to issue 5 year debt.

3.1.5. Critique by Lally

44. Associate Professor Martin Lally has critiqued similar arguments put to the QCA in the context of a QR's proposed access undertaking.[8] Lally argues that the above analysis is flawed because:

    i. Greater refinancing risk and higher debt issuance costs are sufficient to explain why firms issue 10 year debt not 5 year debt. Therefore, it does not follow that firms issue 10 year debt in order lower their cost of equity vis-à-vis issuing 5 year debt;

    ii. CEG's references to Modigliani and Miller (1958) in support of its view are "completely unwarranted because Miller and Modiglianin make *no* reference whatsoever to any such connection or even to the debt maturity decision by firms" (emphasis is orgininal).

    iii. That in the face of a 5 year regulatory regime that resets the risk free rate every five years, switching from a 10 year debt issuance to a 5 year debt issuance "would *reduce* the risk faced by equity holders" (emphasis in the original).

45. In our opinion the views expressed by Lally are seriously flawed. Using the same numbering as above, the flaws in Lally's argumentation can be seen by noting:

    i. If *equity holders* decide not to issue short term debt, even though short term debt is expected to have lower interest rates, it is because the *equity holders* do not want to be exposed to the refinancing risk (or higher transaction costs). It simply does not make sense for Lally to argue that the reason *equity holders* prefer to

[8] Lally, The Appropriate Term For The Risk Free Rate And The Debt Margin, April 2010.

issue long term debt is to lower refinancing risk but that this is unrelated to the risks borne by *equity holders*. Professor Lally is correct that higher transaction costs associated with issuing 5 year debt may also explain why firms do not issue 5 year debt. However, if this is the explanation then it equally follows that compensating such an inefficient debt strategy (that raises overall costs such that firms don't actually do this) would lead to artificially high prices;

ii. Modigliani and Miller's (1958) was the seminal paper which demonstrated that, in frictionless financial markets, how an asset is financed did not affect the asset's value. It is true that Modigliani and Miller provided a stylised example where there were only two financing strategies 'debt' and 'equity'. However, the primary conclusion applies equally to where there are multiple financing strategies (from different maturity debt issues, different subordinations of debt issues and different classes of equity). That Lally claims Modigliani and Miller (1958) is only relevant to considerations of gearing levels (as opposed to other aspects of financing strategy) is a very serious error and brings the entirety of his analysis under question.

iii. Lally fails to come to grips with our fundamental point. Firms that are regulated under 5 year regulatory periods do not issue 5 year debt notwithstanding that five year debt has lower interest rates. It follows that, notwithstanding whatever views Lally holds to the contrary, clear empirical evidence is that issuing 5 year debt is a higher cost financing strategy than issuing 5 year debt. Consequently, unless the regulator wishes to set costs based on an inefficient financing strategy, which should raise costs if implemented correctly, the regulator should benchmark the costs of issuing 10 year debt.

46. It is worth noting that, notwithstanding Lally incorrectly criticises our views, ultimately, Lally provides advice to the QCA that suggests that the cost of debt can reasonably be set based on the basis of firms issuing 10 year debt (to the extent that this is what is demonstrated to be the benchmark behaviour of firms consistent with our analysis). The QCA, in the QR decision, does assume businesses issue 10 year debt.

4. Cost of equity

47. This section of the report sets out our views on how the DRs should estimate the cost of equity.

4.1. Relative risk: water versus other utilities

48. In our view, water distribution businesses should be assumed to have the same risk profile as other regulated utilities (such as electricity and gas distribution businesses). In this regard we agree with the Independent Pricing and Regulatory Tribunal of NSW (IPART) which has reached the same conclusion.

49. Water distribution businesses have a very similar cost structure to electricity and gas distribution businesses – with high sunk costs and significant fixed costs associated with operating and maintaining the assets. In our view, the main drivers for the cost of equity for these businesses relate to risks that arise in relation to recovery of their cost base. Chief amongst these is the financing and refinancing risk that equity providers in these firms are exposed to given the high level of assumed gearing. These businesses also have high fixed costs of maintaining the sunk infrastructure such that they are exposed to variations in actual costs from forecast costs. The importance of refinancing risk on total equity risk is highlighted by recent experience during the global financial crisis (GFC) as discussed in section 4.3 below.

50. There is no reason to believe that financing risk for a 60% geared water utility would be any different to financing risk for a similarly geared energy or rail utility. All of these firms are exposed to the vagaries of debt markets and all of these firms will be adversely affected by tightening of conditions in those markets.

51. It should be noted that regulated utility businesses of any description do not face the same risks to revenues as do many unregulated businesses. This is because prices are set by regulation rather than the market which tends to result in relatively more stable levels of prices. In addition, the service being provided is generally regarded as a necessity and demand does not tend to be strongly influenced by variations in economic conditions but rather by other factors such as weather (eg, higher electricity/water usage in a hot/dry summer). Moreover, the quality of water and energy as necessities makes it possible for firms to set pricing structures that further protect them from variations in demand. For example, water and energy distributors can and do set fixed charges per month without the risk of losing customers. This gives them a revenue stream that is independent of the amount of water/energy actually supplied over their networks. Moreover, to the extent that an extended period of low (high) demand causes costs to be under (over) recovered the nature of the regulatory regime allows future prices to be set to claw back from (return to) customers the relevant amounts.

52. This discussion serves to illustrate that the revenue risks that a business is exposed to depend more heavily on the structure of prices and the nature of the regulatory regime

than they do on whether water, gas or electricity is being distributed along the sunk infrastructure. That is, it is the nature of the regulatory regime rather than the nature of the substance being transported that drives revenue risk.[9]

53. Consistent with the logic set out above, we note that Australian regulatory precedent is such that regulators do not tend to take into account differences in revenue risk when assessing the risk faced by different businesses. For example, we note that electricity transmission businesses in the National Electricity Market (NEM) are subject to a revenue cap and, therefore, suffer no risk in uncertainty in relation to the total amount of revenue to be recovered (ie, no 'volume risk'). By contrast, gas distribution and transmission businesses and electricity distribution businesses are subject to price caps under which some volume risk does exist (at least temporarily). Nonetheless, the standard practice, now embedded in Law, has been for these firms to be assumed to all have the same relative risk (ie, same equity premium).

54. This is consistent with the conclusion (asserted above and justified below) that the dominant source of risk is not revenue risk but is actually financing risk – a risk that these businesses share equally.

55. It is certainly the case that the differences between the customer bases and demand profiles for water and energy distribution businesses are much smaller than the differences between energy distribution businesses and energy transmission businesses. By way of example, consider the difference between a gas transmission business serving predominantly gas fired power stations and gas distribution businesses serving predominantly residential customers. Given that regulation tends to make no distinction between the risk profile for transmission and distribution of gas it would not, in our view, be consistent to assume a different risk profile for water distribution to gas distribution.

56. Given that the cost structure and financing risk for the water DRs is very similar to energy distributors and given that the nature of the regulatory regime to be applied to the DRs is broadly similar to the nature of the regulatory regime applied to other regulated utilities it is our view that the risk of the DRs should be assumed to be the same as for other regulated utilities.

Key conclusion – Relative risk of DRs

We believe that the risk profile of DRs is well proxied by the risk profile of other regulated utilities, including those in the energy sector.

[9] In any event, we note that both energy and water distribution businesses receive the overwhelming majority of their revenues from residential customers and small commercial customers. For example, even Integral Energy, which serves the industrial area of West of Sydney, receives 92.5% of its revenue from low voltage customers (see page 74 of Integral Energy's 2010 Annual Pricing Proposal available at aer.gov.au). We understand for QUB, 65% of revenues are from residential customers. It therefore appears that QUB has a similar, and perhaps higher, reliance on commercial customers than does Integral (noting that some of the 92% of Integral low voltage revenues will be from small businesses).

4.1.1. Regulatory precedent

57. In our view, the weight of regulatory precedent supports the view that water and energy distribution utilities have similar levels of risk.

58. The UK is one of the few places where regulation is applied to privately owned water businesses. The UK regulator, Ofwat, has recently used the CAPM to estimate the cost of capital for the period 2010 to 2015. Most recently it has done so in its decision document *Future water and sewerage charges 2010-15: Final determinations.* In doing so it has set the equity beta at 0.9 assuming a gearing level of 57.5%. In making this decision Ofwat concludes:

> *It will enable efficient companies to maintain access to the capital markets throughout 2010-15 and beyond.*

59. This is relevant for a benchmark privately owned water utility because, unlike with Government ownership, investment must be funded from capital markets rather than relying on a Government owner to supply the capital.

60. The Ofwat equity beta estimate is equivalent to an asset beta of 0.51[10] and an equity beta in the UK of 0.94 at 60% gearing. In Australia, the corresponding equity beta at a gearing of 60% is even higher at 1.02. This higher beta in Australia for a 0.51 asset *beta is due to the lower effective rate of corporations' tax (assuming imputation credits halve the cost of corporations' tax to investors (ie, a gamma of 0.5)).*

61. The UK energy regulator, Ofgem, does not explicitly disclose the parameters used to *arrive at its estimate of the WACC. However, in Ofgem's 7 December 2009 Electricity Distribution Price Control Review: Final Proposals Ofgem* the cost of equity has been set at materially *lower* level than for water businesses regulated by Ofwat (Ofwat set the real cost of equity at 7.1% while Ofgem set the real cost of equity at 6.7%).

62. In its most recent decision for the Gladstone Area Water Board (GAWB) the QCA has set the asset beta at 0.4 (giving rise to an equity beta of 0.65 using the Conine leverage formula at a gearing of 50% and a debt beta of 0.11 and a value of gamma of 0.5). This gives rise to an equity beta of 0.77 which is very similar to the 0.8 equity beta currently adopted in Australian energy regulation decisions by the AER.

63. IPART has explicitly considered the issue of whether water utilities have higher or lower risk than energy utilities.

> *The Tribunal notes that in its 2005 determination for the regulated retail water agencies, it considered whether the water businesses face more or less*

[10] *Using the Conine leverage formula and a debt beta of 0.11, Ofwat's assumed* gearing of 57.5% and the UK corporations tax rate of 28% (see http://www.hmrc.gov.uk/rates/corp.htm).

systematic risk than the Australian gas and electricity network. The Tribunal concluded that there is no evidence to suggest that the water agencies face more or less systematic risk than the Australian gas and electricity network businesses. Therefore, the Tribunal set an equity beta in a range of 0.8 to 1.0. The Tribunal believes that this equity beta range of 0.8 to 1.0 is appropriate value for the Council's water businesses.[11]

64. IPART, has maintained this range for the equity beta in its most recent Gosford City Council Wyong Shire Council Prices of Water Supply, Wastewater and Stormwater Services From 1 July 2009 to 30 June 2013. This compares with the AER equity beta estimate for energy utilities of 0.8.

65. The Essential Services

66. The Essential Services Commission of Victoria (ESCV) has set the equity beta for water utilities materially lower than other regulators at 0.65 (for 60% gearing). However, the ESCV's justification for this is based on its view that energy utilities have a similarly low equity beta. (In its last gas distribution decision before the AER taking regulatory responsibility the ESCV set the equity beta at 0.7.) In its most recent metropolitan water decision the ESCV justifies its decision to set the equity beta at 0.65 in the following manner:

The Commission recognises that that there is limited data on water industry equity betas as water businesses are generally government owned. The Commission's decision on the equity beta in the GAAR was predominantly based on analysis by the Allen Consulting Group (ACG) which established 0.5 to 0.8 as the feasible range for gas distribution businesses.[45] *The equity beta was one of the elements of the GAAR final decision that was appealed by the gas distributors. The appeal panel upheld the Commission's decision on the equity beta. The Commission sees this as evidence that the analysis undertaken by ACG is reliable. The Commission maintains its view that 0.65 is appropriate as it is the midpoint of the range.* [12]

Key conclusion – Regulatory precedent on relative risk of DRs

Regulators in the UK and Australia tend to explicitly or implicitly assume that water utilities have the same risk as energy utilities. This is consistent with our theoretical conclusions outlined in the previous section.

[11] IPART, Gosford City Council Wyong Shire Council Prices of Water Supply, Wastewater and Stormwater Services From 1 July 2006 to 30 June 2009 page 105.

[12] ESCV, 2009, Metropolitan Melbourne Water Price Review 2009 Final Decision June 2009, page 65.

4.2. Selection of asset pricing model

67. There is universal regulatory precedent in Australia for the adoption of the capital asset pricing model (CAPM) as originally formulated by Sharpe in 1964. In that model the cost of equity for a business is set equal to:

$$R_e = R_f + \beta_e \cdot (R_m - R_f) \quad \text{(i)}$$

where: R_f is the risk free rate (generally proxied by the prevailing yield on nominal Commonwealth Government bonds less an estimate of expected inflation);

β_e is the equity beta and is proportional to the expected covariance between the return on the equity and the return on the market as a whole; and

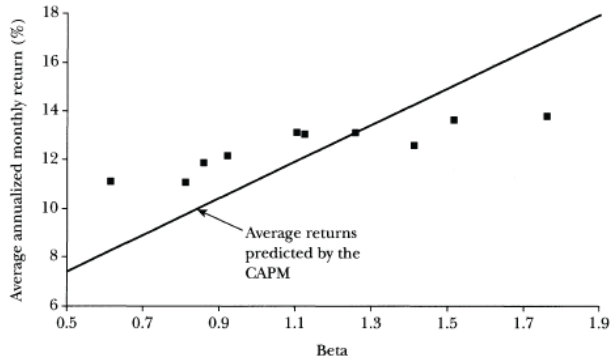
$(R_m - R_f)$ is the expected market risk premium (MRP) being the expected return on the market less the risk free rate.

68. Given this universal regulatory precedent we consider that it is appropriate for the DRs to estimate the benchmark cost of equity within this framework. However, we note that there have been a large number of empirical tests of this model and these come to a universal conclusion that, when the equity betas used are estimated from stock market data, the CAPM formula described above tends to underestimate investors' required return when the estimated equity beta is less than 1.0 and overestimate investors' required returns when the estimated equity beta is more than 1.0.

69. This literature is surveyed at appendix A to this report. However, a useful summary of the literature is contained in the following figure from Fama and French (2004) which demonstrates the difference between the actual relationship between equity beta estimated from market data and equity returns compared to the predicted relationship where the risk free rate is the yield on Government bonds.

Figure 2

Average Annualized Monthly Return versus Beta for Value Weight Portfolios Formed on Prior Beta, 1928–2003



70. In the above graph, the Government bond rate defines the intercept of the CAPM security market line (SML = the dark line). The slope of the line is defined by the market risk premium measured relative to the Government bond rate. That is, the SML as drawn is the SML predicted by the Sharpe CAPM.

71. As is clear from the above graph the actual relationship between betas estimated from stock market data and market returns is much flatter than that predicted by the CAPM with Government bond yields used as the risk free rate. This is a general finding of the empirical tests of the CAPM

Key conclusion – caution is required when implementing the Sharpe CAPM

On the basis of the empirical literature we consider that it is appropriate for the Queensland water businesses to be cautious when interpreting the results of equity beta estimation from stock market data.

4.3. Equity beta

72. Historically in Australia there was a strong regulatory precedent to set the equity beta for a 60% geared utility issuing 10 year debt at 1.0. That is, there was a strong precedent to assume the risk for such a regulated utility was at the same level as the average in the market.

73. However, this precedent should not be confused with assuming that regulated utilities have the same underlying risk as the average firm. The average firm in the Australian economy has a gearing of around 30%. Higher levels of gearing concentrate risk amongst equity holders and, consequently, assuming regulated utilities have the same

risk as the market despite having twice the gearing is equivalent to assuming that regulated utilities have half the underlying level of risk.

74. In the last few years there has been a move by regulators to set the equity beta for regulated utilities at 0.8. In early 2009 the AER most recently adopted this position in its regulation of electricity businesses and has since adopted the same position for gas businesses.

75. In coming to this conclusion the AER relied heavily on econometric work of Prof. Henry from Melbourne University who has estimated the equity betas from stock market for a sample of listed regulated utilities (ie, the historical covariance between the returns on the market and the returns on an individual stock divided by the variance of the market over the same period).

76. In its final decision on the cost of capital for regulated electricity businesses,[13] the AER interpreted this econometric work as supporting the view that an equity beta of 0.7 may be appropriate. However, the AER stated that it had regard to "the importance of regulatory stability" and aspects for National Electricity Objectives in arriving at an estimate of 0.8 for the equity beta. The AER has since adopted the same value, justified on the same basis, for Jemena Gas Networks.

4.3.1. CEG analysis

77. We do not contest the econometric work of Professor Henry in the sense that he correctly estimated the historical co-variance relationships. However, we are less comfortable with the AER's interpretation of those estimates. As described above, and in more detail in Appendix A, it is well established in the empirical finance literature that betas estimated in this fashion do not accurately predict the true return required by investors.

78. Consistent with the advice of the AER's own consultant, Professor Handley, and as set out in Appendix A, there are four key conclusions from the literature:

    i. The empirical results that equity betas derived from stock market data are biased is not contested;

    ii. One explanation for this is that the model is correct but the equity betas estimated from stock market data are biased;

    iii. Another explanation is that the model is wrong; and

    iv. Which is the correct explanation is not a settled matter in the literature.

[13] AER, Electricity transmission and distribution network service providers, *Review of the weighted average cost of capital (WACC) parameters* May 2009 see page 334.

79. Of course, for our purpose it does not matter what the correct explanation for the empirical fact is. What is important is that 'plugging in' equity betas of less than 1.0 that have been estimated from stock market data will tend to underestimate required returns. On this basis we do not believe that, at the time, the AER acted sufficiently cautiously in lowering the equity beta to 0.8 (notwithstanding that it believed the best estimate of the equity beta estimated from stock market data was around 0.7).

80. We note that the AER was making its decision in late 2008 and early 2009 and was doing so primarily on data that preceded the GFC. We have since examined data during the GFC to establish whether the behaviour of the same regulated utility stock prices was consistent with and equity beta of less than 1.0. Our conclusion is that this data supports the adoption of an equity beta estimate of at least 1.0.

Why focus on the GFC

81. Prof. Henry's econometric work only covered the period up to 1st September 2008. Despite Prof. Henry's last report being provided to the AER in April 2009 it did not include reference to any data beyond 1st September 2008. The justification provided for this was that:

> *The consultant advised the ACCC that the events associated with the Global Financial Crisis after September 2008 mitigate against extending the sample post September 2008. The Capital Asset Pricing Model is an equilibrium asset pricing model. Events in the period post-2008:9 are unlikely to be consistent with equilibrium and are consequently excluded from the sample under consideration.*[14]

82. In our view, to the extent that Prof. Henry's reasoning is correct then the Sharpe CAPM is not a suitable model for any regulator to use to estimate required returns for real world regulated businesses. Real world regulated businesses have to raise capital even during periods of economic crisis and dislocation. To set required returns for those businesses on the basis of data and inference that is only taken from, or relevant to, stable equilibrium conditions would be unacceptable.

83. However, we note that even in what may seem 'perfectly stable' market conditions rational investors will not assume that these conditions will always prevail in the future. A rational investor in a regulated business will be very interested in how regulated businesses performed during the global financial crisis (GFC) precisely because this is an indicator of what can be expected in future crises.

84. If regulated businesses 'sailed through' the GFC then an investor today will be comforted by this fact and will demand a lower risk premium for such investments than

[14] Olan Henry, Estimating β Submitted to ACCC 23 April 2009 (page 8)

if, for example, regulated businesses performed worse than the average for the market over the GFC.

85. We note that the entire logic of the Sharpe CAPM is that a business will be low risk if it tends to perform relatively well when the market is performing poorly. Such stocks offer "insurance" against crises such as the GFC in that holding these stocks will tend to reduce the overall exposure to losses during a general downturn on the market portfolio. This is precisely why the Sharpe CAPM predicts that they will have low risk.

86. In this context, if one is to use the Sharpe CAPM to estimate the cost of equity for regulated businesses we consider that it is wrong to exclude data from the most recent significant fall in equity returns during and subsequent to the GFC.

87. In fact, we consider that the most recent economic downturn should be the focus of any assessment of whether regulated businesses offer 'insurance value' against general market falls such that they would be described as 'lower than average risk' under the Sharpe CAPM. This is because the crisis epitomises precisely the risks that investors demand for investment in equities.

4.4. The conditional CAPM (properly sourcing beta from periods of high market risk)

88. The conditional CAPM attempts to explain the bias associated with the normal application of the CAPM by virtue of the fact that what matters most is not the average historical beta but the beta that prevails in periods when risk premiums are high. Jagannathan and Wang describe the conditional CAPM as follows (note that the motivation for the adoption conditional CAPM is the failure of the static CAPM – where static just means that it is assumed that betas are static).

> *In their widely cited study, Fama and French (1992) empirically examine the CAPM given above and find that the estimated value of* γ [a measure of the sensitivity of equity returns to beta], *is close to zero. They interpret the "flat" relation between average return and beta as strong evidence against the CAPM.*
>
> *While a "flat" relation between average return (the sample analog of the unconditional expected return) and beta may be evidence against the static CAPM, it is not necessarily evidence against the conditional CAPM. The CAPM was developed within the framework of a hypothetical single-period model economy. The real world, however, is dynamic and hence, as pointed out earlier, expected returns and betas are likely to vary over time. Even when expected returns are linear in betas for every time period based on the information available at the time, the relation between the unconditional expected return and the unconditional beta could be "flat". The following example illustrates this point.*
>
> *Consider a hypothetical economy in which the CAPM holds period by period. Suppose that the econometrician considers only two stocks and that there are only two possible types of dates in the world. The betas of the first stock in the*

two date-types are, respectively, 0.5 and 1.25 (corresponding to an average beta of 0.875). The corresponding betas of the second stock are 1.5 and 0.75 (corresponding to an average beta of 1.125). Suppose that the expected risk premium on the market is 10 percent on the first date and 20 percent on the second date. Then, if the CAPM holds in each period, the expected risk premium on the first stock will be 5 percent on the first date and 25 percent on the second date. The expected risk premium on the second stock will be 15 percent on both dates. Hence, an econometrician who ignores the fact that betas and risk premiums vary over time will mistakenly conclude that the CAPM does not hold, since the two stocks earn an average risk premium of 15 percent, but their average betas differ.[15]

89. The fundamental point here is that historical average betas estimated from stock market data cannot naively be applied to an average market risk premium – unless neither of those factors vary through time. If a type of investment tends to have a high beta in periods of economic uncertainty (when total risk premiums are high) then an average historical beta will underestimate the true average risk premium. Equally, if an asset has a very low beta when perceived risk is low then an average historical beta will give too much weight to that beta.

90. If we don't know what the future holds (and that is the basis of risk in the first place) then when estimating betas we should give most weight to the betas that exist in periods when risk is high. It is these betas that matter most for investors – not the betas that exist when there is little perceived risk. This is illustrated in the above example provided by Jagannathan and Wang, despite having a historical average beta of 0.875 (less than 1.0) the first stock requires the same average return as the market because its beta is above 1.0 at times when market risk is high.

91. Of course, this is only relevant if regulated utilities tend to have higher betas than average when market risk is higher than average. In order to analyse this we have examined the behaviour of regulated utility stock prices over the period of the global financial crisis. We find that over this period, the six Australian listed companies that are primarily regulated asset owners had higher risk than the market (measured in terms of their beta and in terms of the losses associated with holding regulated utility stocks over this period). The below table describes the fact that, during the crisis, regulated utility stocks actually performed worse than the market as a whole (consistent with a beta of greater than 1.0).

[15] Jagannathan and Wang The Conditional CAPM and the Cross-Section of Expected Returns, The Journal of Finance, Vol. 51, No. 1. (Mar., 1996), pp. 3-53

Table 6: Market vs utility returns: 2 January 2008 to 6 March 2009 (nadir of the market return)

	Return
Market	**-47%**
Mean for regulated utilities	**-52%**
Median for regulated utilities	**-54%**
Individual regulated utility	
SPN	-27%
ENV	-66%
HDF	-83%
APA	-27%
SKI	-55%
DUE	-54%

Source: Bloomberg, CEG analysis

92. This high risk was largely driven by the regulated utilities exposure to the systemic risks associated with refinancing heavily geared businesses during a financial crisis. This high level of risk during the crisis is picked up in historical average beta estimates confined to this period.

93. The table below describes the beta estimates using data from 150 trading days centred on the day in which the ASX200 reached its lowest point during the most recent crisis (6 March 2009). This equates to data from the 17 November 2008 to 24 June 2009. Reported in the below table are beta estimates using 5 day periods to 10 day periods to estimate the relevant covariance (giving 30 observations for 5 day betas

Table 7: Average betas in the midst of the crisis

Days in period	5	6	7	8	9	10
Beta estimate	0.9	1.4	1.7	1.4	1.1	1.4

Source: Bloomberg, CEG analysis

Actual market performance over the GFC

94. It is important that we examine the actual experience of regulated utility returns over the period of the GFC rather than simply taking the equity beta estimates described above 'at face value'. Figures 1 to 6 below show the cumulative return for an investment in each of the six regulated utilities on 2 January 2008 until the 18 May 2010.

95. The following salient facts can be gleamed from these figures. First, of the six regulated utilities, only one of them (APA) provided investors with a safer investment than the market as a whole over the crisis. Four of the others fell by more than the

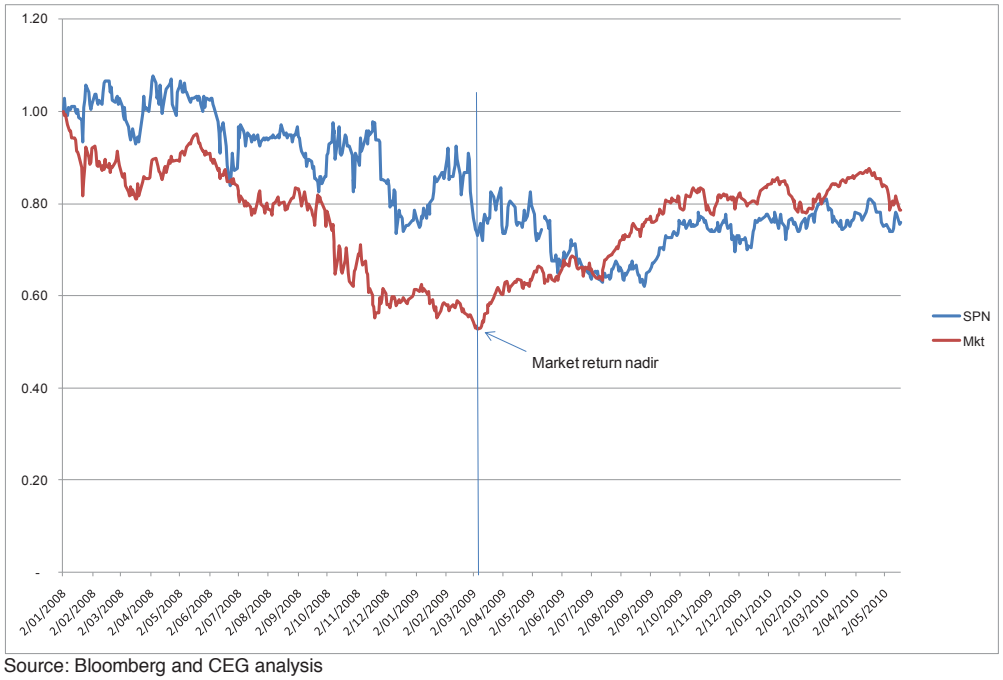
market and one (Envestra) fell by almost exactly the same amount. This demonstrates that investors did not, on average, receive any insurance value as a result of holding regulated utility equities. In fact, holding regulated utility stocks over this period would have exacerbated the fall in a diversified market portfolio – consistent with a beta of greater than 1.0.

96. Second, the loss on the market portfolio reached its greatest magnitude on the 6th of March 2009 at which point it had provided a negative 47% return for an investor relative to market values on the first trading day of 2008 (2 January 2008). As described in Table 6 above, over the same period the mean/median reduction in the regulated utility equity was 52%/54% with 4 out of the six firms suffering greater losses than the market.

97. This demonstrates that, not only have regulated utility stocks performed worse over the period 2 January 2008 to the current period but they also performed worse from 2 January 2008 up to the bottom of the market. This conclusion is not dependent on the start date for the period.

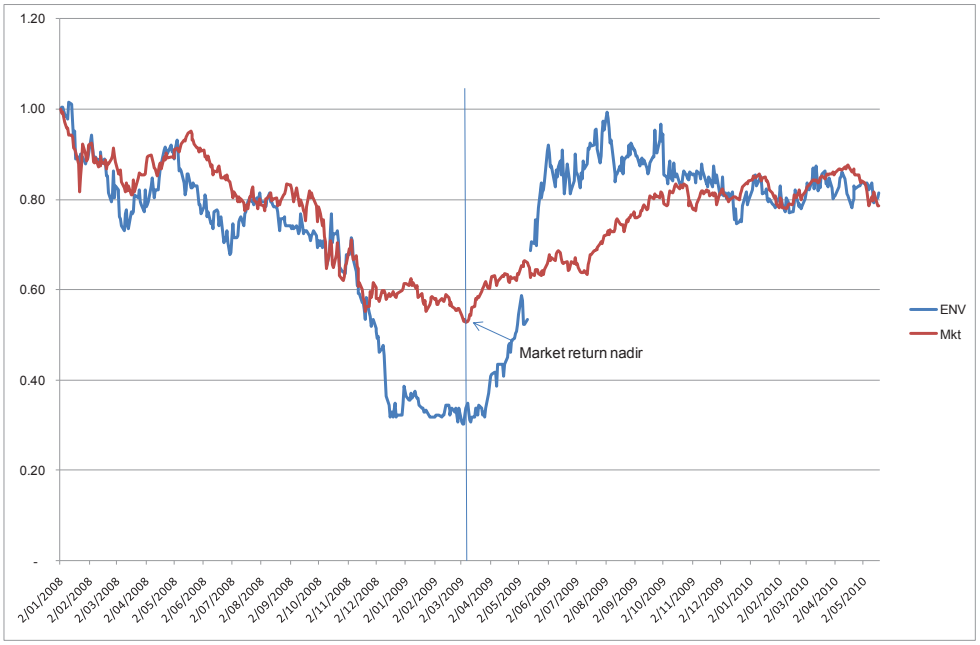
98. The below figures describe the dataset more fully. They make clear that, over the period of the GFC when the market fell by almost 50% regulated utility stocks provided no protection against those losses to investors and have actually fared worse than the market. Given that the GFC is precisely the type of event that the Sharpe CAPM assumes investors would value protection against this is strong evidence that a beta lower than one should not be assigned to regulated utilities.

Figure 1: SPN vs Market returns from 2 January 2008



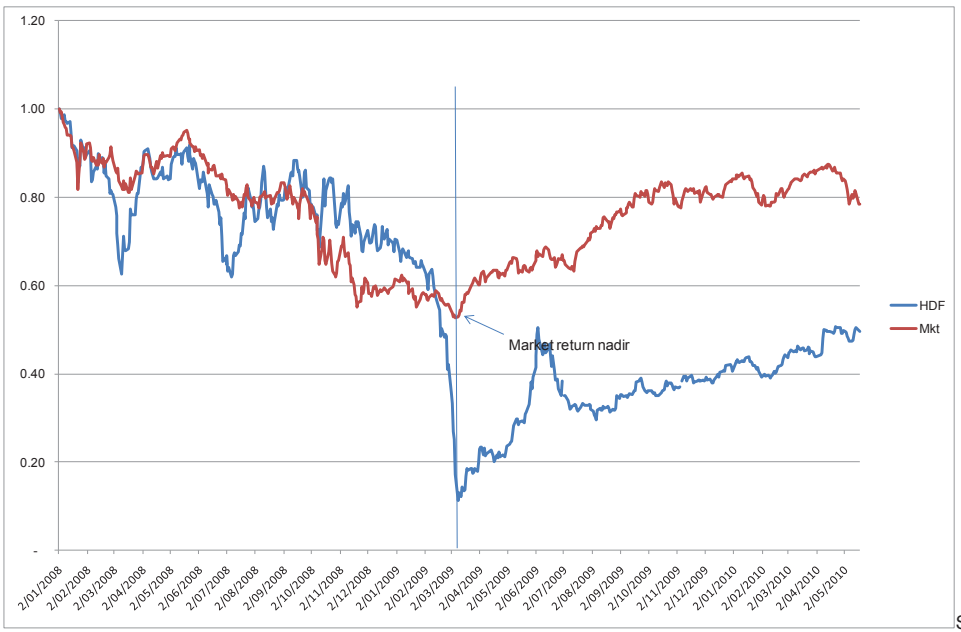
Source: Bloomberg and CEG analysis

Figure 2: Envestra vs Market returns from 2 January 2008



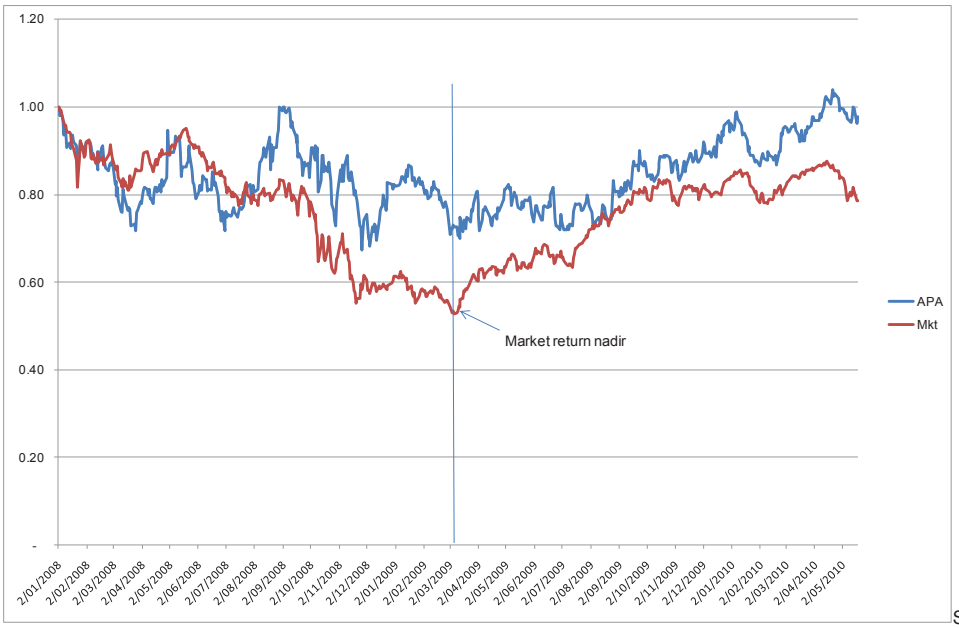
Source: Bloomberg and CEG analysis

Figure 3: HDF vs Market returns from 2 January 2008



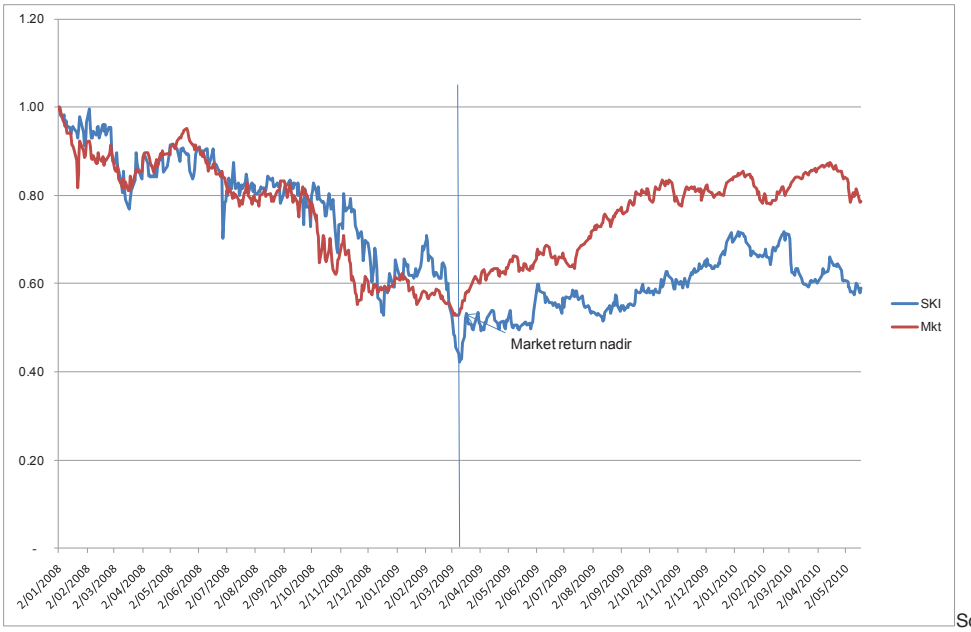
So
urce: Bloomberg and CEG analysis

Figure 4: APA vs Market returns from 2 January 2008



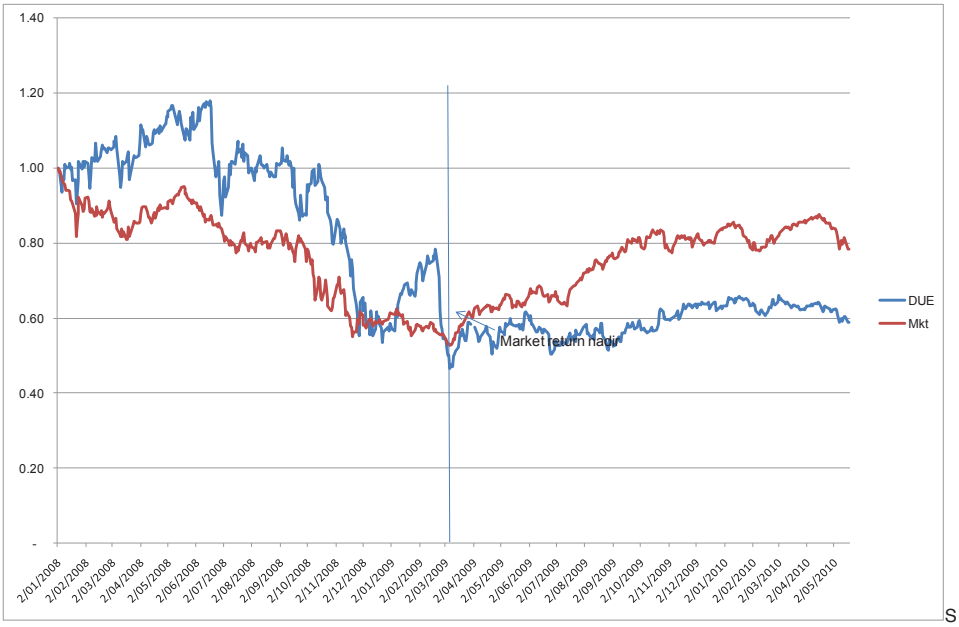
Source: Bloomberg and CEG analysis

Figure 5: Spark (SKI) vs Market returns from 2 January 2008



Source: Bloomberg and CEG analysis

Figure 6: DUET vs Market from 2 January 2008



Source: Bloomberg and CEG analysis

4.4.1. Conclusion on equity beta

99. It would be conservative for the DRs to assume and equity beta 0.8 based on recent regulatory precedent. A less conservative, but more consistent with the available empirical evidence outlined above, would be to set the value of the equity beta equal to 1.0

Key conclusion – beta

The DRs should set the equity beta no lower than 0.8 and a value of 1.0 would be reasonable.

4.5. Risk free rate

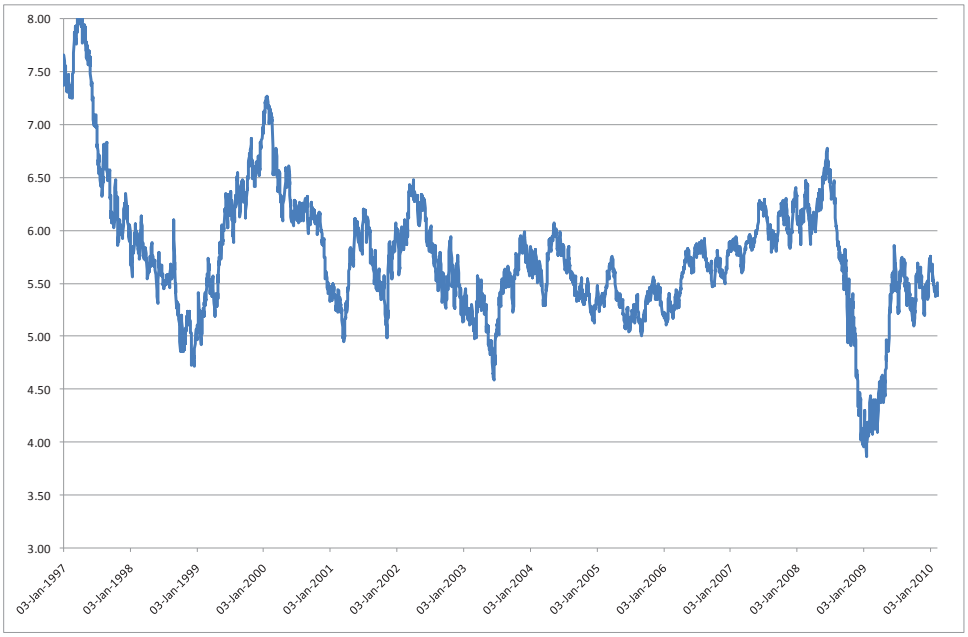
100. The majority of regulatory precedent in Australia is for the risk free rate to be set equal to the yield on 10 year Commonwealth Government bonds. We consider that, in most circumstances, this is reasonable. However, in periods of economic crisis, such as experienced during the GFC, we do not consider that this is reasonable.

101. In periods of economic crisis there is an extreme rush to the liquidity and safety of government bonds. This has the effect of increasing the price and depressing the

yield on those bonds. Unless the market risk premium (MRP) is increased to reflect the higher risk of investment in economic crises, this then an application of the Sharpe CAPM with a contemporaneous but depressed risk free rate and a historical average MRP will underestimate the true cost of equity.

102. This can be seen clearly in the below graph where 10 year bond rates reached historic lows in late 2008 and early 2009. -

Figure 7: Nominal 10 year CGS yields up to 2 January 2009



Source: RBA data

103. Consequently, if one adopts a MRP that is heavily influenced by historical averages rather than forward looking rates then the methodology will fail to pick up increases in the MRP. However, if the methodology always uses the prevailing risk free rate then it will pick up falls in the risk free rate as investors 'rush to safety'.

104. This gives rise to the perverse outcome that, in the midst of a crisis, the methodology will estimate a historically low cost of equity when, in reality, the cost of equity is historically high (see also discussion around Figure 8 below).

105. This issue was of critical importance in the context of the AER's regulation of the NSW and Tasmanian electricity utility businesses. The AER attempted to set these

businesses' cost of equity by reference to the risk free rate measured in the depths of the GFC when Government bond rates were at historic lows. The AER then combined this with an MRP that was based on historical average MRP levels (which were substantially lower than the prevailing risk premium during at the time).

106. The AER, at least in part, justified this approach by arguing that the governing regulations did not allow it to take into account the higher than average MRP. CEG advised that this approach would not lead to an accurate estimate of the cost of equity. The reasons for this advice can be found in our January 2009 report to the businesses.[16] Nonetheless, the AER maintained it methodology. This decision was appealed to the Australian Competition Tribunal (ACT) who overturned the AER's decision. The ACT ordered that the risk free rate be measured in a different earlier period less affected by the crisis.

107. In order to deal with this problem we recommend that the risk free rate be set based on the average yield on 10 year CGS over the preceding 5 years. This will ensure that, given the MRP is not set on a purely forward looking basis, its combination with a purely forward looking risk free rate will not lead to perverse outcomes.

108. We note that this is consistent with the approach of UK regulators who tend to set the risk free rate based on historical averages rather than on prevailing government bond rates. For example, in relation to the real risk free rate, Ofwat states:

> ***A risk-free rate of 2.0%.*** *This is below the 2.8% we assumed at the last price review. It is well above the current spot rates for index-linked gilts but consistent with the view that the risk-free rate is expected to increase in the medium term. It is also consistent with the ten-year long-run historic UK index-linked gilts of five and ten-year maturity and consistent with recent regulatory determinations.*[17]

109. However, there are alternative ways of of dealing with the problems associated with the fact that government bond rates can sometimes be seriously depressed during periods of economic crisis. These are:

    i. Identify periods of crisis that are affecting the measured risk free rate and, if the proposed measurement period falls in such an affected period, alter that measurement period to a less affected period. This was effectively the ACT's solution to the problem; and

    ii. Adopt the Government bond rate even if it is seriously depressed by an economic crisis during the proposed measurement period. However, also adjust the MRP to

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16 CEG, *Rate of return and the averaging period under the National Electricity Rules and Law,* January 2009.

17 Ofwat, *Future water and sewerage charges 2010-15: Final determinations, page 128.*

reflect any heightened risk premiums demanded by investors in such circumstances.

110. In our view, each of these approaches is reasonable. We note that estimating the risk free rate based on a historical average basis is consistent with estimating the market risk premium (MRP) on a historical average basis.

Key conclusion – risk free rate

The five average yield on 10 year CGS should be used to set the risk free rate. Alternatively, if a shorter time period is used to measure the risk free rate then subjectivity must be used to ensure that the resulting risk free rate is consistent with the MRP being used (ie, that the risk free rate is not depressed by a 'rush to safety' at a time when the MRP is unusually high).

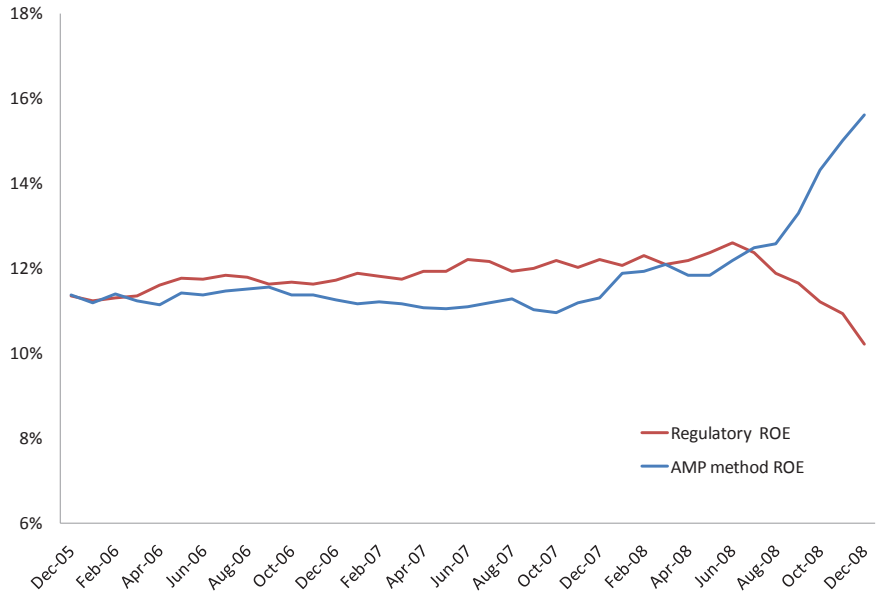
4.6. Market risk premium

111. Until the GFC the standard regulatory practice was to set the MRP equal to 6% largely based on historical data which tended to show that the average historical premium in Australia was 6% or greater. Regulators have justified setting the MRP at the lower end of the measured historical range on a number of grounds including an assumed reduction in risk premiums over time associated with greater capacity for investors to diversify risk (as transaction costs have fallen). Regulators have also noted that forward looking estimates of the MRP (such as derived from dividend growth models) have provided estimates of less than 6%.

112. However, with the onset of the GFC it was clear that the prevailing MRP was much higher than 6%. CEG estimated this to be 12% in its January 2009 report for the Joint Industry Association.[18] A graph from that report is reproduced below demonstrating a very significant increase in the forward looking MRP estimated using a method proposed by AMP capital investors. It can be seen that, as the risk free rate was falling the return on equity estimated by regulators was also falling (because the MRP was being held constant). However, the forward looking MRP was rising dramatically – in precisely the opposite direction to the regulatory return on equity.

[18] CEG, *Forward looking estimates of the equity premium*, January 2009.

Figure 8: Movements in the regulated and market return on equity



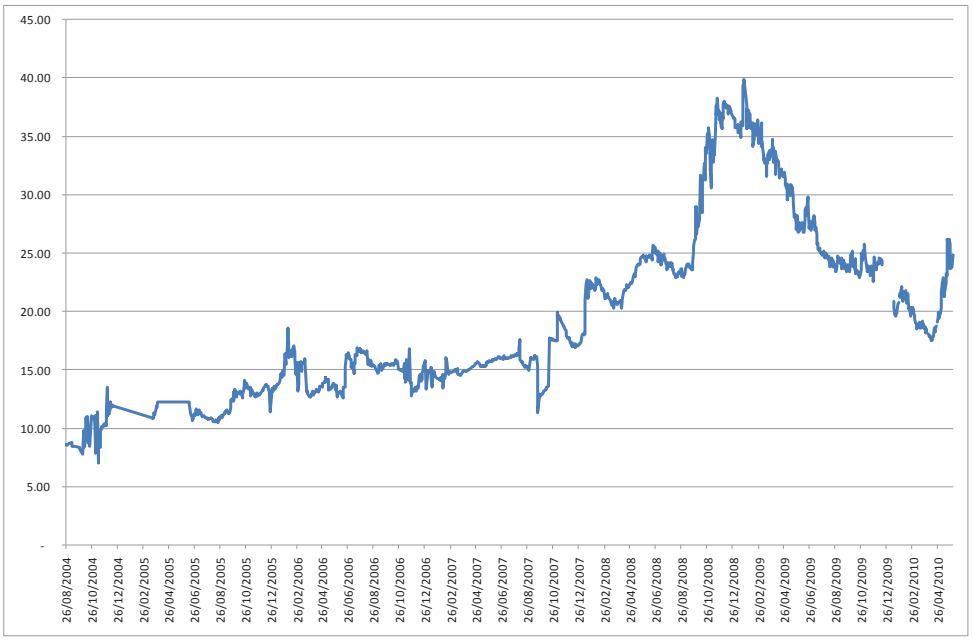
Source: RBA data, CEG analysis

113. Since then the AER has increased its estimate of the MRP from 6.0% to 6.5% to reflect the sorts of concerns we expressed in our report to the AER. As demonstrated in the above figure, this would clearly have been an inappropriately small adjustment at the time (a 0.5% upward adjustment when the regulatory return on equity was being underestimated by something in the order of 6%). By contrast, in its recent QR decision the QCA has retained a 6% MRP.

114. The justification for not raising the MRP (not raising it by more) appears to be that the MRP is to be set for an extended period and it was is unclear how long the heightened MRPs due to the GFC would be maintained (or even if they have already returned to 'normal' levels).

115. In our view the forward looking MRP continues to be heightened by the impact of the GFC and, more recently, the threat of sovereign debt default to the global financial system. This is reflected in a heightened level of expected volatility of the ASX 200 index. The expected volatility of the ASX200 index over the next 12 months can be estimated from the price of exchange traded options. The below graph demonstrates that while implied volatility has fallen from its peak in early 2009 it has still not returned to its pre GFC levels and has recently increased sharply.

Figure 9: Implied volatility in the ASX 200 index



116. In our view, a conservative approach for the DRs would be to adopt the AER's estimate of the MRP equal to 6.5%.

Key conclusion – MRP

A conservative approach for the DRs is to set the MRP at 6.5%.

4.7. Deriving a real return (estimating inflation)

4.7.1. Assuming a prevailing risk free rate is adopted

117. In order to derive a real rate of return it is necessary to adopt an expected 10 year inflation rate. Until relatively recently it was the practice of Australian regulators to use the break even inflation rate, derived from the Government bond market (CGS[19] market), as the inflation forecast.

[19] Commonwealth Government Security.

118. In the CGS market there are two types of bonds issued – CPI indexed CGS and nominal CGS. The yield on CPI indexed CGS tends to be lower than the yield on nominal CGS because the former will benefit from inflation indexation and the latter will not. For this reason the yield on indexed CGS is often described as the 'real' yield meaning it is the yield that is received after the cost of inflation is removed.

119. However, the great bulk of bonds issued are nominal CGS and the Commonwealth had, until recently, stopped the issuance of any new indexed CGS.[20] As a consequence, the market for nominal CGS is considerably more liquid than indexed CGS.

120. The difference in yields between indexed and nominal CGS provides a measure of the value that investors place on both inflation indexation and liquidity. This difference is known as the 'break even' inflation rate because it is the rate of actual future inflation at which a long term investor will receive the same payment whether or not they hold the indexed CGS or the nominal CGS.[21]

121. The past practice of adopting the break even inflation rate as a forecast of inflation expectations implicitly assumed that the following factors could be ignored (either because they were non-existent or because they cancelled out):

- that investors in CGS did not place any higher value on nominal CGS due to their higher liquidity than indexed CGS. The effect of this is to lower nominal CGS yields and lower break even inflation below actually expected inflation; and
- that investors only paid more for the inflation protection of indexed CGS by an amount that reflected their expected level of inflation. That is, investors did not pay more again purely due to the 'peace of mind' associated with inflation expectations. The effect of this is to lower indexed CGS yields and to raise break even inflation above actually expected inflation.

122. The impact of these two factors on break even inflation rates is commonly accepted. [22]

123. Having regard to reports from CEG[23] and NERA[24] and the subsequent advice of the RBA regulators (such as the QCA, AER, ESCV and IPART) concluded that the second factor was significant and outweighed the first factor.

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20 See AOFM Annual Report *2007-08* - Role of the Commonwealth Government Securities Market, page 31.

21 Thus, the holder of an indexed CGS 'breaks even' relative to the holder of a nominal CGS at this inflation rate. At actual inflation higher than the break even inflation rate the holder of an indexed CGS outperforms the holder of a nominal CGS and *vice versa*.

22 A useful discussion is provided in a paper by Shen of the US Federal Reserve available at:http://www.kansascityfed.org/Publicat/econrev/PDF/2Q06Shen.pdf. For example, Shen states: "Accurately inferring market expectations of inflation from yield spreads is difficult. The difficulty lies in the differences in market liquidity conditions between nominal and inflation indexed Treasury securities".

124. Ultimately it was concluded that break even inflation from the CGS market *overestimated* actually expected inflation because investors were willing to pay a premium for inflation protection above and beyond that justified solely by the expected value of inflation. On the basis of acceptance of this bias, regulators stopped using break even inflation from the CGS market as their inflation forecast. This was first formally implemented by the AER in its SPAusnet final decision in January 2008 (see page 12).

125. Instead of using break even inflation the AER's methodology is now to adopt RBA forecasts as providing the best estimate of expected inflation.[25] The AER assumes that in years beyond the RBA's forecast period inflation will be in the middle of the RBA's inflation target range of 2% to 3% pa (ie, the AER assumes 2.5% inflation in these years). Applying this methodology at the time of writing we get an estimate of 10 year expected inflation of 2.63%.

126. This approach was reaffirmed in the AER's draft determination for NSW electricity distribution businesses:

> *"Historically, the AER has used an objective market-based approach to forecast the expected inflation rate—calculated as the difference between the CGS (nominal) and the indexed CGS yields. However, since late 2006 a downward bias in the indexed CGS has become evident due to the limited supply of these securities. Consequently, using this method potentially yields an overestimate of expected inflation" "*[26]

127. An alternative reasonable methodology is that adopted by the QCA in the Gladstone Area Water Board draft decision (March 2010). This is to simply assume that

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23 CEG's advice (commissioned by regulated businesses) was that the high level of break even inflation was the result of a bias in the yield of indexed CGS *relative* to nominal CGS. That is, the importance of factor b) above outweighed the importance of factor a). CEG also argued that nominal CGS were absolutely biased as a proxy for the risk free rate: CEG, Establishing a proxy for the risk free rate, A report for the APIA, ENA and Grid Australia, September 2008.

24 NERA, Bias in Indexed CGS Yields as a Proxy for the CAPM Risk Free Rate, March 2007. Authors: Tom Hird and Bruce Grundy.

25 The AER states: "The AER notes the RBA's responsibility for monetary policy in Australia means it is an independent authority on inflation expectations. The AER considers that the RBA's inflation forecasts are objective and represent the best estimates of forecast inflation for the purpose of this draft decision. The RBA's statement on monetary policy examines a wide variety of objective data influencing inflation in both the domestic and international financial markets to develop its inflation forecast. The forecast is produced on a regular basis and is publicly available, including supporting analysis and reasoning. The AER's approach uses the RBA report. This provides consistency and transparency in the AER process for deriving an inflation forecast."

26 Page 226 of AER 2008 NSW draft distribution determination.

expected long term inflation is 2.5% on the basis that this is the mid-point of the RBA's inflation target range.[27]

128. In our view, either methodology will generally provide a reasonable estimate of the expected level of future inflation.

4.7.2. Assuming a historical average risk free rate is adopted

129. In this report we recommend that the risk free rate be set based on a five year average of 10 year CGS yields. As such, if one is interested in deriving an equivalent real risk free rate then one must deduct the average expected inflation over the last five years. This results in an estimate of the average real risk free rate investors expected over the last five years.

130. Using the QCA method this will involve deducting 2.5%.

131. Using the AER method this will require an average of the expected inflation derived by application of the AER method over the relevant time period. When we do this since February 2007[28], we get an estimate of expected inflation over this period of 13 quarters of 2.57%. Either of these methods are reasonable and it is unsurprising that they give very similar answers given that both rely very heavily on the assumption that long run inflation expectations are anchored in the middle of the RBA's target range. This is only marginally lower than the current estimate using the AER methodology of 2.63%.

[27] Page 104.

[28] The RBA only began publishing inflation forecasts in February 2007 Statement on Monetary Policy.

5. Cost of Debt

5.1. What data service to use

132. Consistent with the assumed financing structure it is necessary to estimate the cost of issuing 10 year debt with a credit rating of BBB+. In Australia there are two data providers that supply an estimate of the 'fair value' of corporate debt with different credit ratings, namely, CBASpectrum and Bloomberg. In our view, the cost of debt can be estimated most accurately, and with least controversy, by taking an average of the estimates from the two data services.

133. CBASpectrum provides a direct estimate of the cost of BBB+ debt at 10 years while Bloomberg only provides an estimate of BBB debt costs at 7 years. However, this 7 year estimate can be extended to 10 years by extrapolating from the shape of the Bloomberg AAA corporate debt curve which does extend out to 10 years. This is the approach taken by the AER based on analysis that suggested that this was the best means of extending the Bloomberg BBB fair value curve. [29]

134. Currently (7 May 2010 to 3 June 2010), the CBASpectrum BBB+ 10 year fair value (8.61%) is substantially below the Bloomberg BBB 10 year fair value (9.98%).

135. In our view, adopting an average of these estimates will give an appropriate weight to the expert opinions embodied in each services estimate. We would only recommend departing from a simple average of the two fair value curves if there was information to suggest that one was in some way aberrant or unreliable.

136. We note that recent regulatory precedent is mixed on how to use these fair value estimates. The QCA has determined that the Bloomberg is a better estimate in its recent QR draft decision:

> *Regarding the estimates, the Authority has concerns that the CBASpectrum estimates generate AAA and BBB+ yield curves that are not markedly different after 5 years. However, theory would predict that an unbiased estimate of a 7-year BBB+ yield should materially exceed a 7- year AAA yield due to a higher probability of default associated with the former. This suggests that the CBASpectrum service is likely to materially underestimate BBB+ yields and accordingly, debt margins, at long terms (e.g. 7-10 years). This proposition appears to be consistent with the available empirical evidence.*
>
> *As a result, the Authority considers that Bloomberg is a more reliable predictor at the current time. However, the Authority notes that Bloomberg no longer reports BBB yields for terms greater than 7 years due to a lack of observations.*

[29] See pages 43 to 45 of AER Final Decision *ACT, Queanbeyan and Palerang gas distribution Network, 1 July 2010–30 June 2015*, March 2010.

While there are a range of options to extrapolate the Bloomberg 7-year BBB yield to obtain a 10-year yield, the Authority considers that QR Network's proposed approach of adding the term premium for the Bloomberg AAA fair value curve (7-10 years) is reasonable. It also results in an estimate that is closer to actual market observations than the CBASpectrum 10-year BBB+ yield. (page 53).

137. By contrast, the AER has developed a statistical test aimed determining which of the two data services is more accurate than the other. In applying this test it has concluded, over a similar period to the QCA's analysis, that the CBASpectrum fair value estimate is superior.

138. While our view is that a reasonable approach is to average the two curves, we are of the opinion that the AER's statistical test is flawed. We are also of the view that, using recent data, if one had to choose between the fair value curves then the QCA's choice of the Bloomberg fair value curve would be preferable.

139. In our view, the AER's statistical test has a number of serious problems and we do not believe that it can be reliably used to choose between the expert opinions of the two data services. A full explanation for this conclusion is provided in Appendix B to this report. In summary, we consider that:

    i. There are significant problems with accessing reliable data on the prices/yields at which bonds actually trade. In the absence of such information, the only data that the AER can rely on are published estimates of the prices that bonds would trade at if they did trade (such as can be found in some banks 'rate sheets'). It is very difficult for the AER, or any other person, to assess the accuracy of the estimates embodied in those rate sheets. Indeed, the estimated yield for the same bond commonly varies wildly depending on the bank rate sheet examined. In this context, we consider that the AER should not hold itself out as able to 'second guess' the expert opinions embodied of the CBASpectrum and Bloomberg data service providers.

    ii. The actual nature of the AER's test is, in our view, flawed in that it does not have regard to relevant information and does have regard to irrelevant information. In particular:

        a. The AER restricts itself to having regard to a small sample of fixed BBB+ bond yield estimates none of which have a maturity of greater than 6 years (ie, none of which approach the relevant maturity level of 10 years);

        b. Part of the process for selection of this small sample involves the incorrect use of the Chow test to determine if a bond yield estimate is an 'outlier';

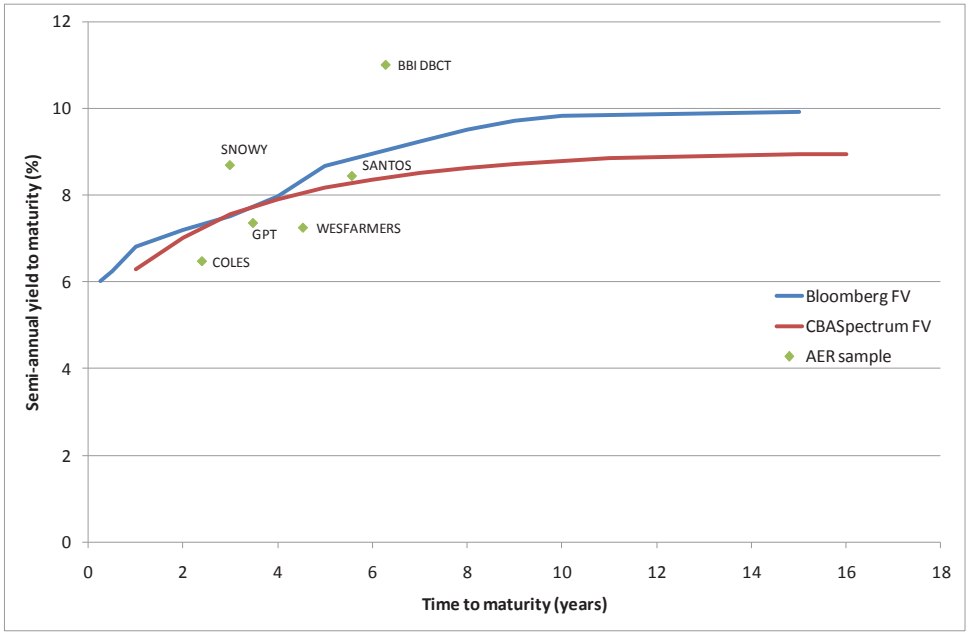
        c. The AER test does not have regard to yield estimates on floating rate notes which are plentiful including in the vicinity of 10 years;

d. The AER test does not have regard to yield estimates on bonds with other credit ratings (eg, A- and BBB) despite the fact that there are a significant number of such bonds with around 10 years to maturity.

140. The impact of these omissions can be described using a series of figures that capture data from 15 February 2010 to 12 March 2010. This is the averaging period used for Actew in the ACT and the AER determined that, during this period, the CBASpectrum 10 year BBB+ fair value estimate was superior to the Bloomberg estimate.

141. The first figure that is relevant shows each of the curves mapped against UBS bond yield estimates for the six BBB+ fixed coupon bonds that the AER had regard to. The AER determined that the highest yielding of these bonds, BBI DBCT, was an outlier and only had regard to the remaining 5 bonds. The AER then performed a statistical test and determined that the CBASpectrum curve was a better fit to the remaining data than the Bloomberg fair value curve.

Figure 10: UBS estimated yields for AER sample



142. For the reasons described in Appendix B we consider that the exclusion of BBI was not properly justified and, had BBI been included, the AER's decision would have been reversed and Bloomberg would have been found to be the best fit to the data.

143. Moreover, we note that the AER made its conclusion without having any regard to the yield on other long dated corporate bonds – including BBB+ rated floating rate notes and bonds with a credit rating only slightly different to BBB+ (ie, A- and BBB). This information is described in the below charts.

144. In our view the data in these charts demonstrates clearly that:

- Amongst long dated bonds BBI is not an outlier. In fact, out of the 30 bonds with more than 4 years to maturity the BBI bond has a spread to CGS that is only the 20 highest (ie, only 5 observations away from the median observation);
- When regard is had to the yield estimates for bonds with longer maturities (eg, greater than 4 years) then it is clear that the Bloomberg fair value curve fits this data much better than does the CBASpectrum curve. Given that we are attempting to estimate a 10 year cost of debt, this is the most relevant information but it is information that the AER statistical test does not have any regard to.

Figure 11: UBS estimated yields for BBB+ Floating rate bonds

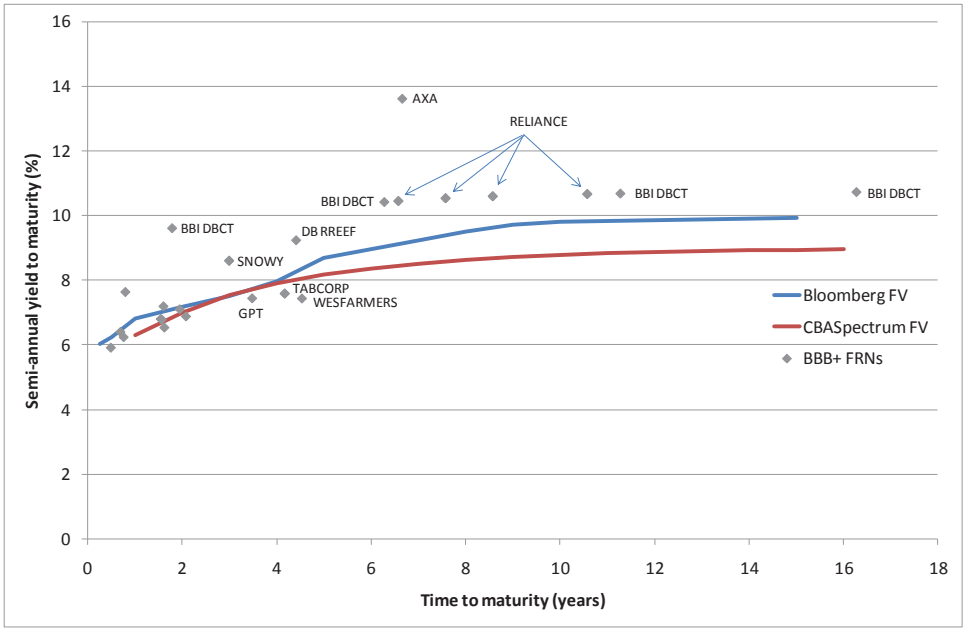


Figure 12: UBS estimated yields for BBB and A- rated fixed bonds

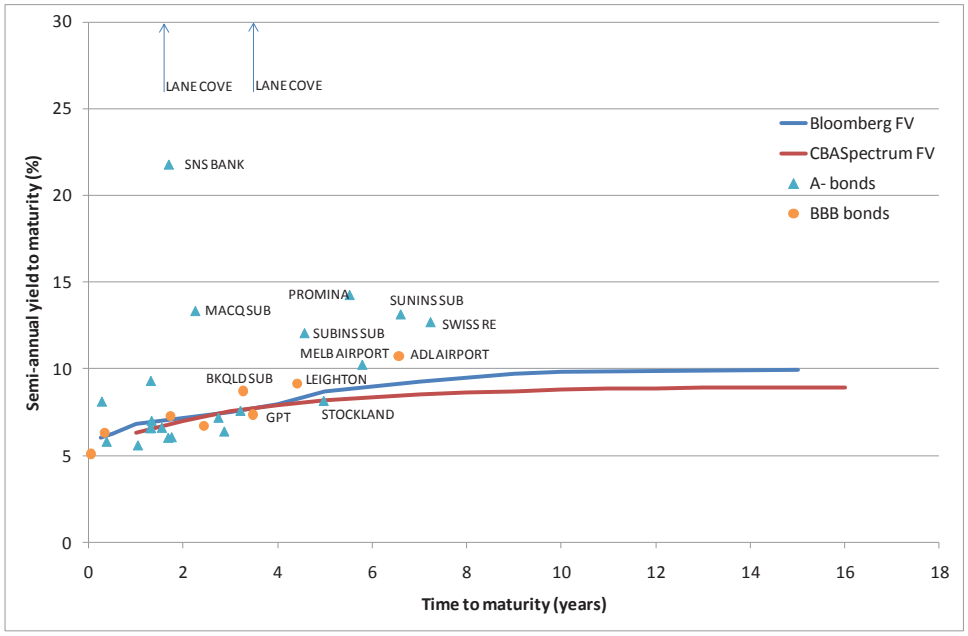
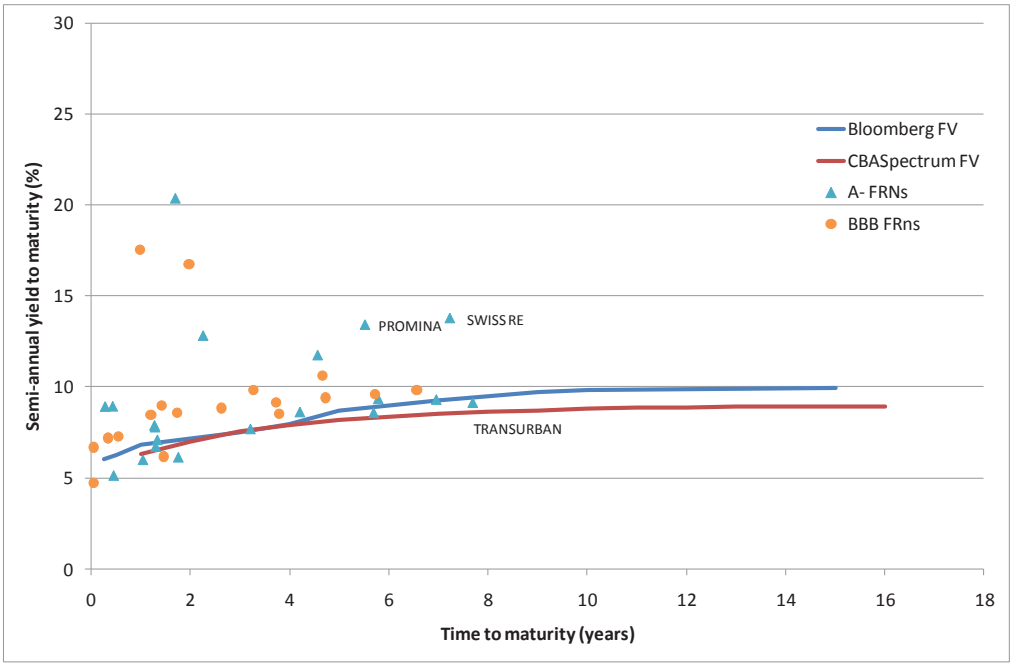


Figure 13: UBS estimated yields for BBB and A- rated floating rate bonds



5.2. What averaging period to use

145. Standard regulatory practice is to set the cost of debt 'as if' a business were to refinance 100% of its debt at the prevailing rates. In this scenario the cost of debt would be estimated as the average cost of debt during a recent window (typically around 15 trading days).

146. We consider that there is merit in adopting a longer period that better reflects the conditions under which a prudent businesses' stock of actual debt would have been issued. In particular, we do not believe that a typical infrastructure business would adopt a refinancing strategy where 100%of debt is refinanced in a short period because it increases the refinancing risks that such a business would be exposed to (eg, were their debt to all fall due in a period where financial markets were not operating efficiently).

147. In reality, businesses tend to issue debt in a more staggered manner so that only some small part of that debt needs to be refinanced in any given year. Consequently, at any given time a business's cost of debt will reflect the average of prevailing interest rates on corporate debt over the last at least 5 years (and often longer).

148. In our view it would be reasonable to reflect this in the averaging period chosen to measure the cost of debt. We recommend that, the cost of debt could be estimated equal to the simple average of:

- average cost of debt over the last five years; and
- the prevailing cost of debt.

149. This methodology would effectively give equal weight to the last five years of debt raising costs and next five years of debt raising costs – with the latter proxied by the prevailing debt raising costs.

150. This gives rise to an estimated cost of debt of 8.79% which reflects an equal weighting given to the average cost of debt over the last five years and the cost of debt during the currently prevailing cost of debt (during the period 24 May 2010 to 3 June 2010). This is lower than the cost of debt estimated if the prevailing cost of debt (9.28%) alone is used to set the cost of debt.

151. This benchmark assumption is adopted on the basis that the compensation for the cost of debt should reflect the actual cost of debt during the coming regulatory period for a benchmark prudent debt financing in strategy. In our view, a prudent debt financing strategy will involve the refinancing of approximately one tenth of the businesses debt each year with the issue of new 10 year bonds. Over the regulatory period the regulated business will be paying interest on debt that was prudently issued in the past and will also be paying interest on newly issued debt during the regulatory period. The proposed method for estimating the cost of debt proxies this by giving weight to both the recent past cost of debt and the prevailing cost of debt. This also protects businesses and consumers from having prices set based on a cost of debt during a short averaging period that simply does not reflect the average cost of debt a firm with a prudent refinancing strategy would face.

6. Cost of taxation - gamma

152. The cost of tax can be modelled directly in cost modelling by applying the corporate tax rate to forecast taxable income in each year – where that forecast takes into account the actual tax depreciation of a regulated business. Alternatively, the cost of tax can be estimated by simply assuming that the modelled return on equity will be equal to taxable income (ie, assuming that regulatory and tax depreciation are the same). This later approach is equivalent to using a pre-tax cost of equity in the modelling.

153. We understand that the practice of the QCA is to model the cost of tax in the cash flows rather than to adjust the discount rate.[30] We consider that this approach is reasonable.

154. Whatever method is employed, in order to estimate the cost of corporate taxes for investors it is necessary to determine what, if any, value those investors place on imputation credits a company earns when it pays corporate tax. In the terminology of Australian regulatory decisions this value is called 'gamma'. If investors place no value on imputation credits created by the payment of corporate tax then the value of gamma is zero and if they value those credits at their full face value then the value of gamma is said to be 1.0.

155. Regulatory precedent on the value of gamma is varied. For example, IPART sets the value somewhere between 0.3 and 0.5 while the AER has recently increased its estimate from 0.5 to 0.65 and the QCA has most recently set the value at 0.5 but has said that it considers this conservative given the AER's higher valuation and the associated evidence that the AER relied on.

156. In our view, the evidence on gamma is generally unreliable (in a statistical sense) and often contradictory. One study employing reasonable assumptions and methodologies will arrive at a low answer and another study employing reasonable assumptions and methodologies will arrive at a higher estimate. We would therefore advise that caution should be exercised in setting the value of gamma at either extreme of the available evidence (ie, too low or too high).

157. In this regard, we note that the AER's estimate of 0.65 has recently been challenged by a number of electricity distribution businesses in (ETSA in South Australia and also the Victorian distribution businesses). They have argued that the AER's 0.65 estimate relied heavily on empirical work performed by Beggs and Skeels and published in 2006.[31] The relevant businesses asked SFG to update the work of Beggs and Skeels and had that updated work reviewed by Skeels. Based on this updated work the

[30] For example, see page 91 of

[31] Market Arbitrage of Cash Dividends and Franking Credits, published in The Economic Record in 2006 (Volume 82 (258), 239-252)

business argued that the best estimate of gamma was around 0.35 and that 0.5 was a conservative estimate.

158. The AER has since sought advice from Professors Michael McKenzie and Graham Partington and separately from Professor Handley. In our view, their conclusions support the view that the AER has set the value of gamma at the upper end of possible values. In particular, McKenzie and Partington state:

> *Triangulation of the evidence relating to the value of dividends and credits distributed would suggest that the gamma value supplied by SFG is substantially on the low side while the gamma value determined by the AER tends to the high side, but much more evidence can be adduced to support the AER's gamma value.*[32]

159. Similarly, Professor Handley has advised the AER that:

> *Based on the discussion in this and my earlier reports, it remains my opinion that a reasonable estimate of gamma is within the range 0.3 – 0.7.*[33]

160. That is, the available evidence does not exclude the possibility that the AER's estimate of 0.65 is correct, however, the available evidence does suggest that, on the balance of probabilities, the correct value is lower.

161. In our view, this supports the adoption of a value of 0.5 which is consistent with past regulatory practice and in the middle of the range supported by empirical estimates.

[32] McKenzie and Partington, Evidence and Submissions on Gamma, Report to the AER, March 2010, p4.

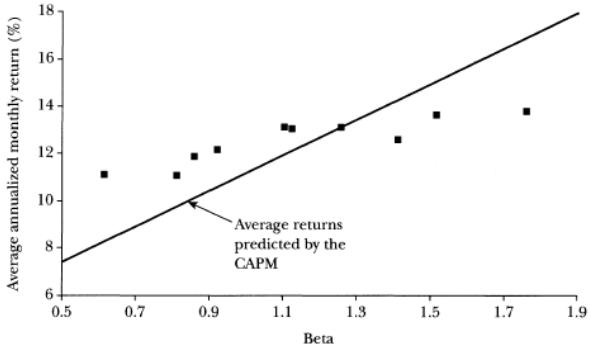
[33] Handley, On the Estimation of Gamma, Report prepared for the Australian Energy Regulator, March 2010, p. 43.

Appendix A. Empirical evidence on the accuracy of equity betas derived from stock market data

A.1. Bias in the CAPM if equity betas are estimated from stock market data

162. The empirical literature unambiguously finds that, when the CAPM is populated with equity with betas derived from stock market data, the outcomes tend to underestimate investors' true required return on equity that has an estimated beta of less than 1.0 (and *vice versa* for equity with an estimated beta of greater than 1.0). This general finding is described in the below figure from Fama and French (2004) which demonstrates the difference between the actual relationship between equity beta estimated from market data and equity returns compared to the predicted relationship where the risk free rate is the yield on Government bonds.

Figure 2
Average Annualized Monthly Return versus Beta for Value Weight Portfolios Formed on Prior Beta, 1928–2003



163. In the above graph, the Government bond rate defines the intercept of the CAPM security market line (SML = the dark line). The slope of the line is defined by the market risk premium measured relative to the Government bond rate. That is, the SML as drawn is the SML predicted by the Sharpe CAPM.

164. As is clear from the above graph the actual relationship between estimated betas and market returns is much flatter than that predicted by the CAPM with Government bond yields used as the risk free rate. This is a general finding of the empirical tests of the CAPM as described by Fama and French.

> *"The Sharpe-Lintner CAPM predicts that the portfolios plot along a straight line, with an intercept equal to the risk-free rate, R_f, and a slope equal to the expected excess return on the market, $E(R_M)$- R_f. We use the average one-month*

Treasury bill rate and the average excess CRSP market return for 1928-2003 to estimate the predicted line in Figure 2. Confirming earlier evidence, the relation between beta and average return for the ten portfolios is much flatter than the Sharpe-Lintner CAPM predicts. The returns on the low beta portfolios are too high, and the returns on the high beta portfolios are too low. For example, the predicted return on the portfolio with the lowest beta is 8.3 percent per year; the actual return is 11.1 percent. The predicted return on the portfolio with the highest beta is 16.8 percent per year; the actual is 13.7 percent."

165. The classic empirical investigations of the single factor CAPM models were undertaken by: Fama and Macbeth (1973) and Black, Jensen and Scholes (1972). Fama and Macbeth estimate monthly cross-sectional regressions of stock portfolio risk premiums on estimates of the portfolios' equity betas. That is, all equities in the sample are divided into ten different portfolios according to their beta (from low to high beta portfolios). The returns for each portfolio are then compared with their beta and a regression is performed to assess the relationship between a portfolio's beta and the excess returns (relative to the risk free rate) on that portfolio. This is done for every month in the sample period. If the Sharpe CAPM is true, the estimated regression line should, on average, pass through the origin (ie, zero estimated beta should be associated with zero estimated excess returns).

166. In more technical terms, for each month *t* between 1935 and 1968, the researchers ran a cross-sectional regression of the form:

$$r_{pt} - r_{ft} = \lambda_{0t} + \beta_{pt} \cdot \lambda_{1t} + e_{pt}$$

where r_{pt} denotes the month t return on portfolio p and r_{ft} is the risk-free rate in month t. β_{pt} is the estimated equity beta of portfolio p in month t. The average of the monthly estimated λ_{0t} values is significantly positive and greater than 0.48 percent per month (greater than 5.9% pa). **That is, when the estimated beta (using stock market data) is zero that equity nonetheless tends to earn a return that is substantially above the Government bond rate.**

167. Similarly, the average of the monthly estimated λ_{1t} is positive but significantly less than the realized average value of the market risk premium. That is, stock returns were estimated to be sensitive to beta but not as sensitive as predicted by the Sharpe CAPM.

168. Fama and Macbeth also test the fundamental CAPM prediction of a positive linear relation between expected risk premiums and equity betas by including both the stock's squared equity beta and the standard deviation of the stock's return as additional explanatory variables in the regressions. Inclusion of a beta squared term allows a test for linearity. Inclusion of a measure of non-market-related uncertainty allows a test of the Sharpe CAPM prediction that only beta and not standard deviation attracts a risk premium. Fama and Macbeth do not reject the null that the average risk

premium is unrelated to both squared betas and non-market risk and hence conclude that they cannot reject the hypothesis that returns are linearly related to beta.

169. Using data for the 1931-65 period, Black, Jensen and Scholes (1972) regressed the average monthly returns on 10 portfolios on the portfolios' historical betas. The average monthly market risk premium over the period is 1.42%. The estimated return on zero beta equity in excess of the government bond rate is 0.359% per month, significantly greater than the zero predicted by Sharpe's model. **That is, the return on equity estimated to have a zero beta is estimated to be 4.4% pa above the government bond rate.** Like Fama and Macbeth, Black, Jensen and Scholes conclude that (i) they can reject the Sharpe CAPM and (ii) the data are consistent with the Black CAPM.

170. The conclusion of this literature is that the Sharpe model, when populated with equity betas derived from stock market data, does not describe reality and will under (over) estimate the cost of equity for low (high) equity beta equity.

171. More recent tests find an even flatter relationship between market returns and beta. Fama and French (2004) state:

> *"Fama and French (1992) also confirm the evidence (Reinganum, 1981; Stambaugh, 1982; Lakonishok and Shapiro, 1986) that the relation between average return and beta for common stocks is even flatter after the sample periods used in the early empirical work on the CAPM."*

172. More recently, Campbell and Vuolteenaho (2004) have estimated that the return on zero beta equity is above not only the government bond rate but also is above the market return. That is, lower equity betas are actually associated with higher returns rather than the opposite as predicted by the single period CAPM models (Sharpe and Black).

A.2. Theoretical explanations for the empirical results

173. There are two main theoretical explanations in the literature for the above empirical results. These can be summarised as:

    i. The Sharpe CAPM does not accurately describe how investors perceive risk (ie, investors do not care only about beta when assessing risk); and

    ii. The Sharpe CAPM is the right model but equity betas determined from stock market data are biased estimates of the true equity betas that investors perceive.

174. We are agnostic about which of these explanations are correct. The important point from the perspective of the DRs is that they should be careful not to give too much weight to empirical estimates of the beta from market data if these estimates are significantly different to 1.0.

A.2.1. Why the Sharpe CAPM may be right but estimating betas from stock market data may be wrong.

175. There are well known theoretical reasons why equity betas estimated from stock market data may not be a good proxy for the equity beta in the CAPM (be that the Sharpe CAPM or any other variant of the CAPM). In particular, the theoretically correct definition of the equity beta is the covariance between returns on one asset and the average returns on *all* assets in the economy (not just listed equity). Importantly, all assets include housing, other property, land (including agricultural land), human capital (eg, the return to education) and debt. This makes estimation of equity betas purely from stock market data an imperfect proxy for what, in theory, one is attempting to measure.

176. This is precisely the advice that the AER received from Associate Professor Handley[34] when it sought advice on a survey of the empirical literature provided by CEG.[35]

> *The empirical evidence presented by CEG is not new.*
>
> ● *There is no consensus as to how the empirical evidence should be interpreted. For example, Roll (1977) argues the choice between alternative forms of the CAPM is extremely sensitive to the choice of the proxy for the market portfolio and in particular, while the results of Black, Jensen and Scholes (1972) and Fama and MacBeth (1973) appear to support the Black CAPM over the Sharpe CAPM, "their tests results are fully compatible with the Sharpe-Lintner model and a specification error in the measured 'market' portfolio" (p.131).7 Roll and Ross (1994) similarly suggest the results of Fama and French (1992) can alternatively be explained by an inefficient market proxy while Kothari, Shaken and Sloan (1995) suggest the Fama-French results are partly explained by data frequency and survivorship bias.*
>
> ● *Roll (1977) argues that the market portfolio, which includes all assets, can never be empirically identified and therefore the CAPM can never be empirically tested. This limitation is acknowledged by Fama and French (2004, p.25) who state "The CAPM's empirical problems may reflect theoretical failings, the result of many simplifying assumptions. But they may also be caused by difficulties in implementing valid tests of the model".*

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[34] Handley *Comments on the CEG reports*, 20 November 2008. See second dot point on page 5. Handley summarises the finding of Roll (1977) that implementation of the CAPM is "*extremely sensitive to the choice of the proxy for the market portfolio*" Handley also quotes Roll saying that estimation of equity beta and MRP from stock market data alone is consistent with a "specification error in the measured 'market' portfolio".

[35] CEG, Estimation of, and correction for, biases inherent in the Sharpe CAPM. This paper noted other reasons why estimating beta using stock market data and inserting this estimate into the NER cost of equity formula may result in an inaccurate estimate of the cost of equity These are detailed in our earlier report *Estimation of, and correction for, biases inherent in the Sharpe CAPM*. In summary, the Fisher Black version of the CAPM (based on Black (1973) predict that the sensitivity of required returns is less than envisioned by Sharpe (1964) once one relaxes the assumption that all investors can borrow unlimited amounts at the risk free rate (eg, at the same rate that Governments can borrow). Similarly, extensions by Merton also create the possibility that beta plays a less important role in determining expected returns

> ● *The Fama-French three factor model was derived empirically, rather than starting from a theoretical base.*[8] *Notwithstanding subsequent papers, such as*
>
> *Berk, Green and Naik (1999) may provide some intuition behind the model, its empirical genesis arguably introduces a "black-box" element into its application, since there is insufficient evidence, and certainly no consensus, at this stage to conclude what the factors actually represent.*[9]
>
> *To summarise according to Copeland, Weston and Shastri (2005, p.164), "In fact, researchers have been working on tests of the CAPM for nearly 40 years, and no conclusive evidence has been published to date – the jury is still out".*

177. The above quote from Professor Handley accurately summarises the literature and concur with its four key conclusions, namely:

    i. The empirical results that equity betas derived from stock market data are unreliable is neither new nor contested;

    ii. One explanation for this is that the model is correct but the equity betas estimated from stock market data are biased;

    iii. Another explanation is that the model is wrong; and

    iv. Which is the correct explanation is not a settled matter in the literature.

Appendix B. CEG critique of AER method for selecting a fair value curve for the cost of debt

178. The AER's has established a methodology for testing whether the CBASpectrum BBB+ fair value curve or the Bloomberg BBB fair value curve provides a better basis for arriving at an estimate of the yield on BBB+ bonds with 10 years to maturity. For short we describe this as the estimate of the cost of debt.

179. In relation to the issue of the debt risk premium (DRP), the AER has noted that arguments regarding the robustness of methods used by Bloomberg and CBASpectrum with respect to producing data for the DRP have previously been raised and considered by the AER and other regulators.

180. The AER has acknowledged that the methodologies used by Bloomberg and CBASpectrum are not completely transparent to stakeholders and that this is a factor subject to current consideration by the AER, the Australian Competition and Consumer Commission and other regulators.

181. In the absence of an alternative methodology, the AER undertakes a process of analysis to determine which of CBASpectrum and Bloomberg is the most accurate in predicting observed yields. In recent decisions the AER has concluded that the use of CBASpectrum's BBB+ fair value curve provides the best available prediction of observed yields for the purposes of determining the yield on the benchmark BBB+ 10 year corporate bond.

182. Working within the parameters of the AER's approach to testing Bloomberg and CBASpectrum estimates, the purpose of this report is to set out the modifications to that approach that CEG considers would enhance the robustness of the AER's approach to the extent that it attempts to analyse which of Bloomberg and CBASpectrum estimates are a better source of fair value estimates.

B.1. General criteria for estimating the cost of debt

183. In previous reports submitted to the AER, we have set out general criteria that a methodology should satisfy in order to be an accurate and reliable means for arriving at an estimate of the cost of debt.[36] These criteria are that the methodology should:

    i. result in an unbiased estimate of the cost of debt;

    ii. incorporate all relevant information and not rely on irrelevant information, such that the standard error of the estimate is low;

    iii. produce results that are consistent with accepted academic finance theory and empirical research;

    iv. produce results that are timely and responsive to changes in market conditions; and

    v. be transparent, including transparency about how and to what end discretion has been employed.

184. The first criteria states that the methodology should not, on average, be expected to arrive at an estimate that is higher/lower than the cost of debt. That is, the methodology should not be systematically biased.

185. The second criteria requires that the methodology be as accurate as possible. In order to be as accurate as possible the methodology must have regard to all potentially relevant information and must not have regard to irrelevant information.

186. To illustrate the distinction between the first and second criteria, imagine that one was interested in estimating the average weight of a ball-bearings coming off a production line. One methodology to do this might be to take a sample of ten ball bearings and measure the average weight. Another methodology might be to take a sample of 1,000. Both methodologies will be unbiased, however, the second methodology will take into account more information than the first.

187. The third and fourth criteria are largely subordinated to the first two, in that an unbiased methodology which takes into account all relevant information should produce results that are consistent with finance theory and market conditions.

188. The final criteria ensures that the methodology is transparent enough that it can be replicated to produce the same result, applying the same assumptions.

[36] For example: Hird T, *Estimating the cost of 10 year BBB+ debt: A report for ETSA, Ergon and Energex*, June 2009, p 3.

B.2. The AER methodology

189. The AER methodology is as follows:

    i. Source yield estimates for a sample of BBB+ rated bonds that meet certain criteria;

    ii. Test the accuracy of the respective fair value curves in predicting the yields on those bonds with the most accurate fair value curve;

    iii. Choose the most accurate fair value curve as the basis for determining the *observed annualised Australian benchmark corporate bond rate for corporate bonds for bonds with a BBB+ credit rating and a maturity of 10 years.*

B.3. Sample selection

190. In its sample selection the AER applies the following criteria:

- exclude all bonds that have maturity of less than 2 years;
- exclude all bonds that are not rated BBB+ by Standard and Poor's during the relevant period;
- exclude all bonds that do not have yield estimates available from all three of UBS rate sheets, CBASpectrum and Bloomberg Generic (BGN) yields;
- exclude all floating rate bonds or other bonds that are not fixed coupon bonds;
- exclude all bonds that are not issued in Australia (even if the issuing company is Australian);
- exclude all bonds that are issued in Australia but are not issued by an Australian company; and
- exclude all bonds that the AER determines have yields that are not consistent with a BBB+ credit rating, ie, where the AER determines that the 'market perceived credit rating' for that bond is not BBB+.

191. All but the last two exclusions are self explanatory and do not involve the use of any further discretion by the AER. The last two exclusions are not fully described and as a consequence would appear to leave open a role for discretion in future decision making by the AER.

192. It is not obvious to us what it means to be an "Australian company". Telecom New Zealand, SingTel, BHP Billiton (BHPB) and Rio Tinto all have operations in Australia

and are listed on the Australian stock exchange (as well as other stock exchanges internationally) but earn most or significant revenues outside Australia. It is not clear whether all or only some of these companies would constitute an Australian company as perceived by the AER.

193. The AER also excludes bonds where it considers there is strong evidence that the market perceived credit rating is not BBB+. In its draft decision the AER has relied in part on the use of a statistical test and in part on contextual information to exclude a bond issued by Babcock and Brown Infrastructure. It is the nature of such analysis that it will inevitably involve some use of discretion in interpretation of the relevant facts to decide whether a bond has a market perceived credit rating that differs from its actual credit rating.

B.4. Testing the accuracy of fair value curves

194. Having selected its core sample of BBB+ bonds the AER then tests which fair value curve is the closest fit to all of the data measured in terms of which fair value curve as the smallest sum of squared errors in predicting each bonds estimated yield. This involves:

- over the relevant sampling period, estimating the average difference between the estimated yield for a given bond and the fair value curve at the same maturity. This is the "error" in the fair values prediction of this yield;
- taking the square of this error;
- repeating the process for all bonds in the sample; then
- adding the sum of these squared errors together and dividing by the number of bonds.

195. The fair value curve that produces the smallest sum of squared errors is determined to have the best fit to the data. This process is repeated three times using individual bond yield estimates from UBS, CBASpectrum and Bloomberg (BGN yields).

196. If one fair value curve performs best in all tests the AER determines that fair value curve as the best fit to the data. To the best of our knowledge the AER methodology has not specified what it would do in the event that the three tests did not all select the same fair value curve. We work on the assumption that:

- If one curve is selected in 2 out of 3 tests then that curve is selected as the best fit;

- If all three curves (Bloomberg, CBASpectrum and an average of the two) are selected under one of the three tests then the AER would select the average fair value curve as the best fit.

B.5. CEG analysis

197. It is important to preface this discussion with an acknowledgment that the task of attempting to test the relative accuracy of Bloomberg and CBASpectrum fair value curves is complex. It is unlikely that there is one single 'right' test that should be applied in all circumstances. Moreover, the AER's task is made harder by the relatively poor quality of the data available. Indeed, the fact that Bloomberg and CBASpectrum have (sometimes materially) different estimates of fair value is likely, at least in part, a reflection of the quality of the information available. With a sufficiently high quality of data all parties should come to conclusions within a very small margin of each other when attempting to answer the same question.

198. Indeed, with sufficiently high quality of the data the AER would not need to select between a fair value curve produced by someone else it could simply develop its own fair value curve. For example, if there were hundreds of BBB+ bonds on issue with maturity around 10 years and which were all regularly traded at prices that were made public and where these prices were all similar then it would be a relatively simple task to estimate the fair value yield of a BBB+ bond at 10 years.

199. Working within the parameters of the AER's approach to testing Bloomberg and CBASpectrum estimates, in the remainder of this section we set out modifications to the AER's approach that could be made to take account of additional relevant information and/or to otherwise improve the accuracy of the test carried out.

B.6. Appraisal of the AER test against the general criteria

200. In section B.1 above, we put forward criteria that any methodology should satisfy. Specifically, we asserted that any methodology for arriving at an estimate of the cost of debt should :

    i. result in an unbiased estimate of the cost of debt;

    ii. incorporate all relevant information and not rely on irrelevant information – such that the standard error of the estimate is low.

    iii. produce results that are consistent with accepted academic finance theory and empirical research;

    iv. produce results that are timely and responsive to changes in market conditions; and

    v. be transparent including transparency about how and to what end discretion has been employed.

201. In our view the AER's methodology for selecting the most accurate fair value curve will satisfy the first criteria so long as an unbiased sample of bonds is used by the AER and neither Bloomberg not CBASpectrum estimates are themselves systematically biased. [37]

202. It is our view that the third and fourth criteria will be met so long as there is no systematic bias (that is, criteria 1 is met) and all relevant information is incorporated by the AER (criteria 2 is met). With this in mind we now turn our attention to the second criteria.

203. In our view the AER methodology could be improved with respect to meeting the second criteria. Specifically, we consider that there will often be material information relevant to any estimate of 10 year BBB+ debt from sources that currently play no role in the AER methodology as outlined above. This includes information on:

    i. the estimated yields on fixed coupon BBB+ bonds that are covered by one or two of UBS, CBASpectrum or Bloomberg but not all three;

    ii. the estimated yields on BBB+ floating rate bonds (once swapped into an equivalent fixed rate yield);

    iii. the estimated yields on bonds that do not have a BBB+ rating (such as BBB or A-rated bonds); and

    iv. the estimated yields on bonds that are issued in Australia by foreign companies.

204. Information embodied in these yield estimates may be appropriately included in the AER's formal statistical test of the accuracy of the fair value curves. However, even if not included in the formal statistical test it may nonetheless be highly relevant to the estimate of the cost of debt. Failure to have regard to this information will increase the likelihood that the AER methodology will inaccurately determine the cost of debt.

205. Additionally, we consider that the AER methodology could also be improved with respect to the final criteria around transparency. As noted in section 3 above, there is currently considerable discretion that is exercised as part of the AER's approach in the selection of sample bonds. The methodology could be improved by making the exercise of this discretion more transparent, particularly with respect to the exclusion of non-Australian bonds, and those with a different 'market perceived credit rating'.

[37] The AER methodology will result in an unbiased estimate provided that: 1) neither the Bloomberg not CBASpectrum fair value estimates are systematically biased; and 2) the sample of individual BBB+ bonds selected by the AER are not themselves a biased subset of the wider population of possible BBB+ bonds. It is reasonable to assume that over a long time period the above conditions will be met on average and the AER's methodology will lead to an unbiased estimate (ie, will be as likely to overestimate as underestimate the NER cost of debt) are two possible caveats to this conclusion. The first relates to the fact that CBASpectrum and Bloomberg fair value yields are estimates of the yields on secondary trades of bonds not on new issues of bonds. As such, to the extent that new issues trade occur at a lower price than secondary trades a source of bias will exist (to the extent that the NER cost of debt is best interpreted as the cost of issuing new BBB+ debt). Second, to the extent that Bloomberg only assigns BGNs to a sample of bonds with relatively lower/higher yields than the average then this is a potential source of bias.

B.7. Hypothetical example demonstrating the potential usefulness of additional data sources

206. Four variants of the same simple example can demonstrate why the AER should have regard to the sources of information numbered i) to iv) in paragraph 203 above.

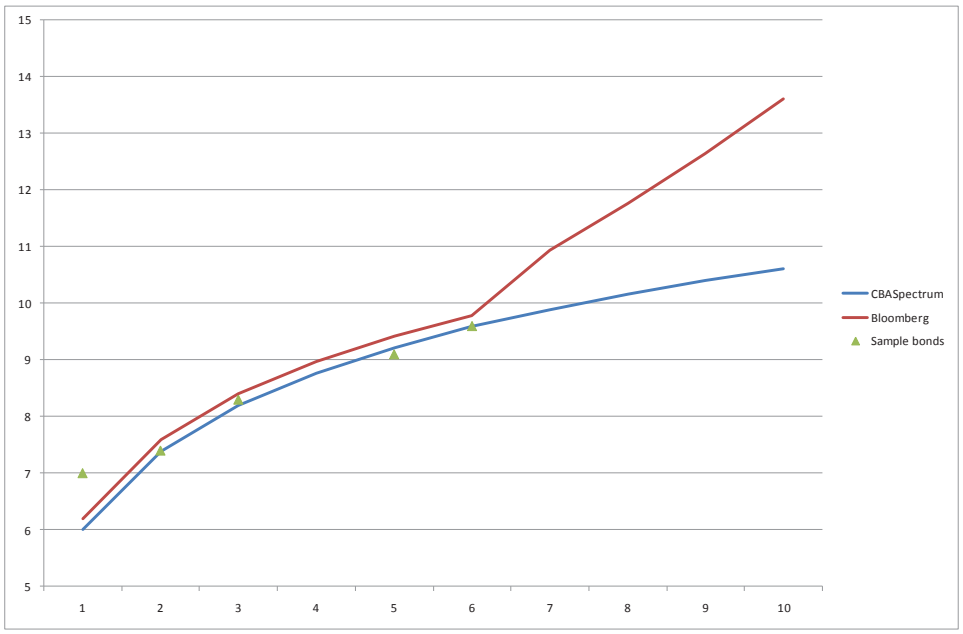
207. The AER methodology as applied in the recent Actew Final Decision relied on only 5 bonds to test the accuracy of the Bloomberg and CBASpectrum fair value curves. The longest maturity bond had less than 6 years to maturity and the average maturity was around 3 years. This means the test only measured the accuracy of the fair value curves between 0 and 6 years (and did so using only a relatively small number of bonds).

208. This means that the test has no power to test the accuracy of any divergences in the fair value curves that occur after 6 years maturity. This is an important factor because the cost of debt requires an estimate at 10 years maturity.

209. In order to make this example as clear and simple as possible imagine that both Bloomberg and CBASpectrum had near identical fair value curves between 0 and 6 years – with CBASpectrum being only slightly below Bloomberg. However, imagine that beyond 6 years Bloomberg yields rose steeply while CBASpectrum did not – such that at 10 years there was a 300 basis point difference between them.

210. This hypothetical example is illustrated in the below graph.

Figure 14: Hypothetical illustration of when curves depart beyond 6 years



211. As drawn, Bloomberg is better estimator (has a lower sum of squared errors) when tested against bonds between one and 6 years. However, this is primarily driven by the observation at 1 year (for the other four hypothetical bonds CBASpectrum is the better estimator).

212. However, the most important question is which of the curves is a better predictor beyond 6 years – specifically which is the better estimator at 10 years. In order to test this question we ideally need data points beyond 6 years (ie, close to 10 years). Having data points between 0 and 6 years is of limited value in this circumstance.

213. In this example (as drawn) the AER methodology would determine that Bloomberg is the most accurate fair value curve – with the effect that the NER cost of debt would be set 300bp higher than that estimated using CBASpectrum. Absent any other information this may, or may not, have been the right decision. It is simply not possible to comment on which is more accurate beyond 6 years without data from beyond 6 years.

214. However, imagine that the additional sources of information numbered i) to iv) in paragraph 203 would have shown there are a large number of bonds of close to 10 years maturity. Specifically:

i. BBB+ fixed coupon bonds that all have yield estimates from UBS and CBASpectrum (but not Bloomberg) and that all of these bonds have yields that are very close to CBASpectrum's 10 year BBB+ fair value estimate (ie, much lower than the Bloomberg fair value estimate); or

ii. BBB+ floating rate bonds that all have yield estimates that are very close to CBASpectrum's 10 year BBB+ fair value estimate; or

iii. BBB floating rate bonds that all have yield estimates that are very close to CBASpectrum's 10 year BBB+ fair value estimate; or

iv. BBB+ fixed coupon bonds that all have yield estimates that are very close to CBASpectrum's 10 year BBB+ fair value estimate.

215. In any one of these situations (or any combination of them) the additional information from the data sources listed above would be extremely useful in determining which curve was the most accurate beyond 6 years. These information sources would constitute the only information relevant to the task at hand – attempting to determine which fair value curve is more accurate at maturities above 6 years (ie, after the point at which they begin to diverge). In our view it would clearly be appropriate to have regard to these sources of information when attempting to estimate the cost of debt.

216. This is a hypothetical example designed to demonstrate when the additional sources of information would be relevant but also where consideration of these details would actually be more relevant to the information captured using the AER methodology. At any given time this may or may not be the case. However, the only way to determine whether this is the case is to actually analyse all of the relevant information.

B.8. Relevance of data sources (i) to (iv)

217. In our view the AER should have regard to the alternative sources of data listed in paragraph 203 since they are all potentially relevant to the accuracy of the Bloomberg and CBASpectrum curves at a maturity of 10 years. We consider that information from these bond yields should only be excluded if the yield estimates for these bonds are biased estimates of what we are interested in (the 10 year cost of debt) and if that bias cannot be reliably adjusted for.

218. In our opinion, whether a bond has a yield estimate from all UBS, Bloomberg and CBASpectrum (as opposed to from two or one of these sources) does not make it unreliable or biased as a relevant source of information. Such bonds should therefore be included in any test (provided that they pass a separate test for being an outlier as discussed below).

219. Similarly, it is not obvious to us that BBB+ bonds issued in Australian by foreign companies will have yields that can be expected to be biased relative to BBB+ bonds issued by Australian companies. As far as we are aware the criteria used by credit rating agencies to assign a bond a BBB+ credit rating do not depend on the nationality of the issuer. For this reason we note that we do not believe that it is an appropriate

restriction on the available data to exclude yield estimates of bonds issued in Australia by foreign companies. Of course, a bond issued by a foreign company could still reasonably be excluded on the basis of an outlier test.

220. We also note that the definition of a foreign company is problematic in a globalised economy. As described earlier, SingTel and Telecom New Zealand both have operations in Australia and both are listed on the Australian stock exchange as well as foreign stock exchanges and both earn material revenues from Australian and foreign operations. Notably precisely the same statements would be true of BHP Billiton and Rio Tinto. We cannot envisage any simple or meaningful definition of an Australian company for the purposes of the AER's test. Moreover, for the reasons set out in the previous paragraph we do not consider that any such definition is required or useful.

221. It is, however, the case that bonds with credit ratings that differ from BBB+ can be expected to have biased yields relative to BBB+ bonds. That is, bonds rated higher than BBB+ can be expected to have yields that are lower than BBB+ bonds and *vice versa*. However, given that the nature of the bias is well understood it is still possible to have regard to these yields when attempting to estimate the NER cost of debt. Consistent with the above example, if we observe a large number of BBB rated bonds with 10 years to maturity that are not outliers and that all have a yield estimate lower than either CBASpectrum or Bloomberg's 10 year BBB+ estimates this is releant information to allow us to conclude that the lower of these BBB+ fair value estimates is more accurate at 10 years.

222. As a matter of theory we strongly find that the equivalent fixed rate on a floating rate bond should be an unbiased proxy for the fixed rate on an otherwise identical bond (ie, identical issuer, maturity and security). This is a simply follows the laws of arbitrage.[38] Minor variations in yields may exist to the extent, for example, the coupon payment cycle is different for the bonds (eg, quarterly for a floating rate bond and semi-annually for a fixed rate bond).[39]

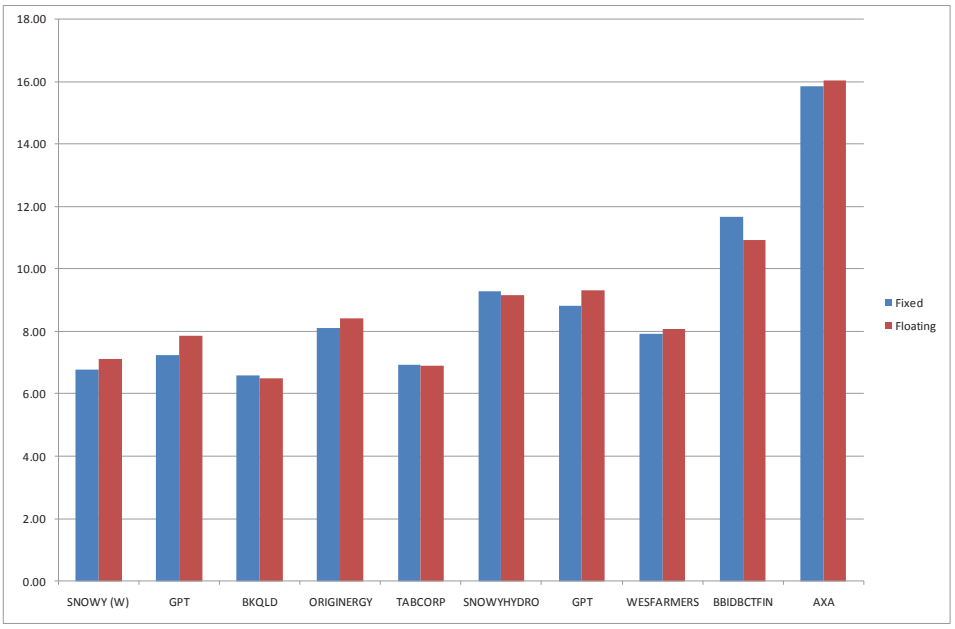
223. This is strongly borne out by the evidence from the UBS rate sheets over the period 27 October 2009 to 25 November 2009. The UBS rate sheets include ten companies who simultaneously issued floating rate and fixed coupon bonds with the same maturity and who which UBS assign a BBB+ rating in this period. As can be seen in

[38] If an investor was faced with the option of buying otherwise identical fixed and floating rate bonds then they could buy the floating rate bond and enter into a swap arrangement (ie, sell the floating component of the bond in exchange for a fixed payment). At the end of this process they would have a fixed income stream equivalent to the fixed income stream from a fixed bond. If the yield on a fixed bond was any higher/lower than the equivalent fixed yield on the floating rate bond then investors would simply buy the fixed/floating bond in preference to the other until the yields equilibrated.

[39] However, this should only have a minor effect within the payment cycle period and should have no effect on the dates that the floating rate coupon is reset. Notably, there is no reason to presume that such timing issues would have a systematically biased affect on the relative yields.

the below graph, in each case the average yield on each fixed coupon bond was very similar to the average equivalent fixed yield[40] on its 'sister' floating rate bond.

Figure 15: BBB+ floating rate vs fixed rate yields for otherwise near identical bonds



Source: UBS, CEG analysis

224. The fact that the yields are not identical may reflect different points in the payment cycle (as discussed above) or may reflect different analysts views (eg, a different UBS analyst covering the floating rate bond than the fixed rate bond) or even may simply reflect different dates at which each was last updated. However, there is no reason to believe that any of these factors systematically bias equivalent fixed rate yields on floating rate bonds below the yields on their sister fixed coupon bonds. This is consistent with the above figure which shows in four out of the ten cases the fixed bond had a higher estimated yield than the floating rate bond.

B.9. Excluding outliers

225. The AER methodology excludes outliers on the grounds that investors may perceive a bond as having a different level of risk than implied by its actual credit rating (a market

[40] UBS rate sheets provide information on the prevailing swap rate to the maturity of the bond to enable the swap calculation to take place, namely by adding the estimated trading margin and the prevailing swap rate. This information is provided to enable precisely this calculation.

perceived credit rating that differs from its actual credit rating). We agree with the AER that it is appropriate to identify potential outliers and to give them less weight (or zero weight) in any subsequent analysis.

226. Identifying an outlier bond is a difficult process at the best of times but is made particularly difficult in recent history – with the global financial crisis causing a wide divergence between estimated bond yields for the same bond (eg, differences of opinion between UBS, Bloomberg BGN and CBASpectrum) and wide divergences between the yields on bonds with the same credit rating.

227. We make the following suggestions on how the AER might usefully amend its process for testing for outliers.

B.9.1. Testing whether a structural break makes a bond an outlier

228. The Chow test applied to relative risk premia only tests whether there has been a structural break in a bonds relative risk premia. It does not test whether the structural break has made the bond an outlier. For example, a bond may have consistently had a risk premium that was 1% lower than the average for BBB+ bonds and then, following some event, may have consistently had a risk premium that was 1% higher than the average of other BBB+ bonds.

229. The Chow test might identify this as a structural break in the relative risk premium for this bond. However, this would not necessarily mean that the bond is an outlier. It simply means that there has been a structural break in its risk premium relative to that of other bonds.

230. In order to test whether the structural break has resulted in the bond becoming an outlier one must also test whether the risk premium for that bond has moved sufficiently far away from the risk premium on other bonds. In order to do this one must perform a statistical test that has regard to the difference between that bond's risk premium and the average of other bonds in the sample and also has regard to the variance in the sample.

231. CEG described three standard tests for outliers in our report on the cost of debt in relation to the AMI decision. [41]

- Chauvenet's test[42] defines a criterion based upon how far an observation diverges from the mean of the sample. The observation is determined to be an outlier if it lies outside a normally distributed confidence interval about the mean with a significance level of 1/(2n), where n is the number of observations in the sample. It should be noted that the nature of Chauvenet's test is that the smaller the

[41] Hird T, 'Estimating the cost of 10 year BBB+ debt during the period 17 November to 5 December 2008', p 57.

[42] Chauvenet, W. (1863) *A Manual of Spherical and Practical Astronomy:* Lippincott, Philadelphia.

sample size the larger the significance level applied – such that with small samples very low significance levels are used to identify potential outliers;

- the "classic" outlier detection test[43] excludes those observations that lie further than two standard deviations from the mean. This is approximately equivalent, under the assumption that observations are drawn from a normal distribution, to excluding those observations where the null hypothesis that they are drawn from the same population can be rejected at a particular level of significance using a two-tailed test;

- the "box plot" test[44] excludes observations that:

  - exceed the 75th percentile by 1.5 multiples of the interquartile range; and

  - lie below the 25th percentile by 1.5 multiples of the interquartile range.

232. A method such as one of the above provides an appropriate statistical method for identifying whether a structural break in relative risk premia has led to a bond becoming an outlier.

[43] See, for example, Rand R. Wilcox, Basic Statistics: Understanding Conventional Methods and Modern Insights Wilcox Oxford University Press page 23

[44] Ibid, page 24

B.10. Extension of hypothetical example

233. This appendix elaborates on the usefulness of including sources of information in addition to these currently considered in the AER methodology. In doing so we use a variant of the simplified example discussed in the body of this report.

B.10.1. Observed yields on bonds with floating rates and ratings other than BBB+

234. The primary purpose of the analysis is to develop an estimate of the NER 10 year BBB+ cost of debt. There are two characteristics that are specified in the NER these are:

- Maturity (ie, 10 years); and
- Credit rating (ie, BBB+).

235. The current test only uses data on Australian fixed coupon BBB+ bonds. As a result of this (and the AER's exclusion of the BBI bond as an outlier) only 5 bonds are included in the AER sample. The longest maturity bond had less than 6 years to maturity and the average maturity was 3.6 years. This means that what has been tested is the accuracy of the fair value curves between 0 and 6 years using a relatively small number of bonds.

236. It is possible that the most accurate fair value curve between 0 and 6 years is also the most accurate fair value curve at 10 years. However, this need not be the case.

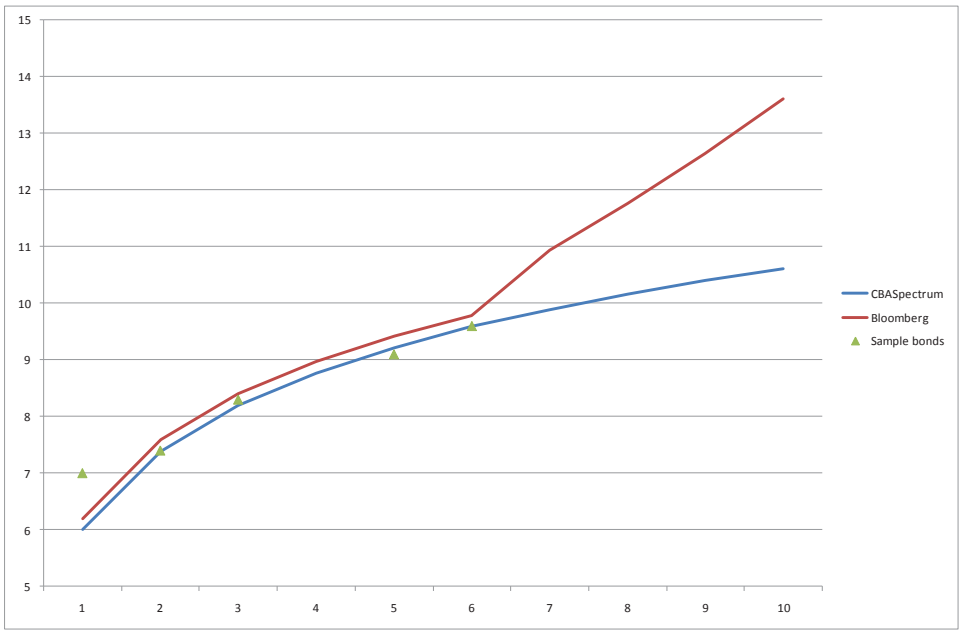
237. A simple example can illustrate this point. Imagine that both Bloomberg (however extended beyond 7 years) and CBASpectrum had near identical fair value curves between 0 and 6 years – with CBASpectrum being only slightly below Bloomberg. However, imagine that beyond 6 years CBASpectrum yields rose steeply while Bloomberg did not – such that at 10 years there was a 200 basis point difference between them.

238. Any test based on bonds with maturities of less than 6 years will find the two curves to be very close to equally good (ie, each curve will have a very similar sum of squared errors). This is because the curves are near identical between 0 and 6 years. However, the selection of one curve over the other will have a dramatic impact on the estimated NER cost of debt at 10 years maturity.

239. The problem is that between 6 and 10 years the fair value curves can move in any manner (even wildly erratic manners) and this will have no impact on the test because there is not bond yield data between 6 and 10 years that satisfies the criteria adopted by the AER for selecting its sample.

240. This hypothetical example is illustrated in the below graph.

Figure 16: Hypothetical illustration of when curves depart beyond 6 years



Source, CEG analysis. All numbers underlying the above graph are hypothetical

241. As drawn, Bloomberg is better estimator (has a lower sum of squared errors) when tested against bonds between one and 6 years. However, this is primarily driven by the observation at 1 year (for the other four hypothetical bonds CBASpectrum is the better estimator).

242. However, the most important question is which of the curves is a better predictor beyond 6 years – specifically which is the better estimator at 10 years. In order to test this question we ideally need data points beyond 6 years (ie, close to 10 years). Having data points between 0 and 6 years is of limited value in this circumstance.

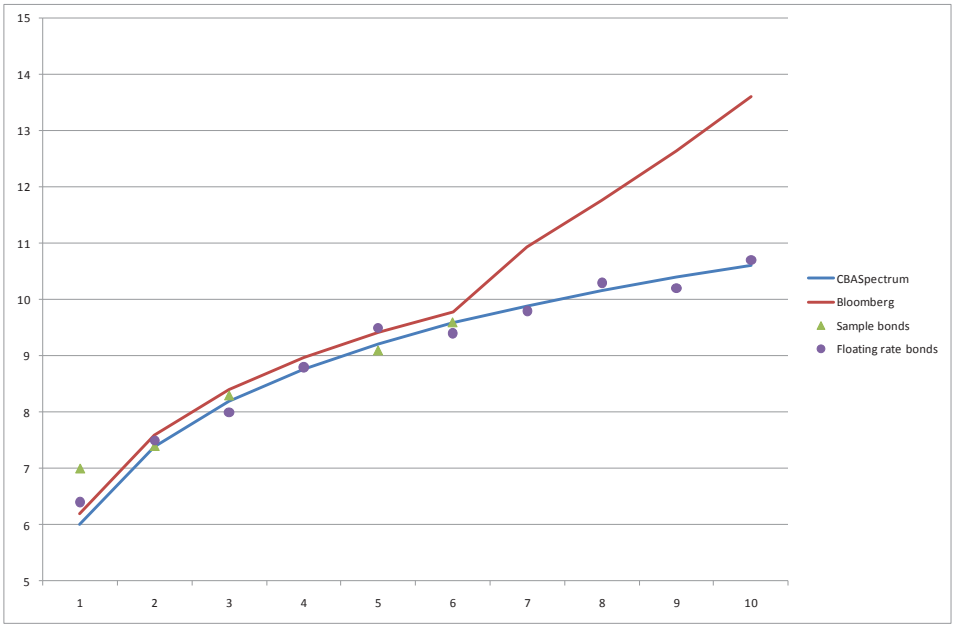
243. If there are no fixed rate BBB+ bonds (that are not outliers) with maturity of greater than 6 years then it will be valuable to seek relevant information from alternative sources. The two obvious sources of relevant information are yields on bonds with maturities of more than 6 years and a similar credit rating to BBB+ (eg, BBB or A-rated bonds) or the implied fixed coupon yield on a BBB+ floating rate bond.

B.10.2. Including floating rate bonds

244. For example, imagine that there were 10 BBB+ rated floating rate notes that met the remainder of the AER's sample selection criteria (eg, not outliers and issued by

Australian companies in Australia). Now also imagine that when plotted on the above graph they looked as follows.

Figure 17: Hypothetical Including BBB+ FRN's in the sample



Source, CEG analysis. All numbers underlying the above graph are hypothetical

245. In the hypothetical example described above it appears to us that it would be extremely valuable to have regard to the implied fixed yield on floating rate bonds when testing the accuracy of the fair value curves. The implied fixed yield on the floating rate bonds is consistent with the yield on fixed coupon bonds for maturities of less than 6 years. However, they have the advantage of providing a data source beyond 6 years.

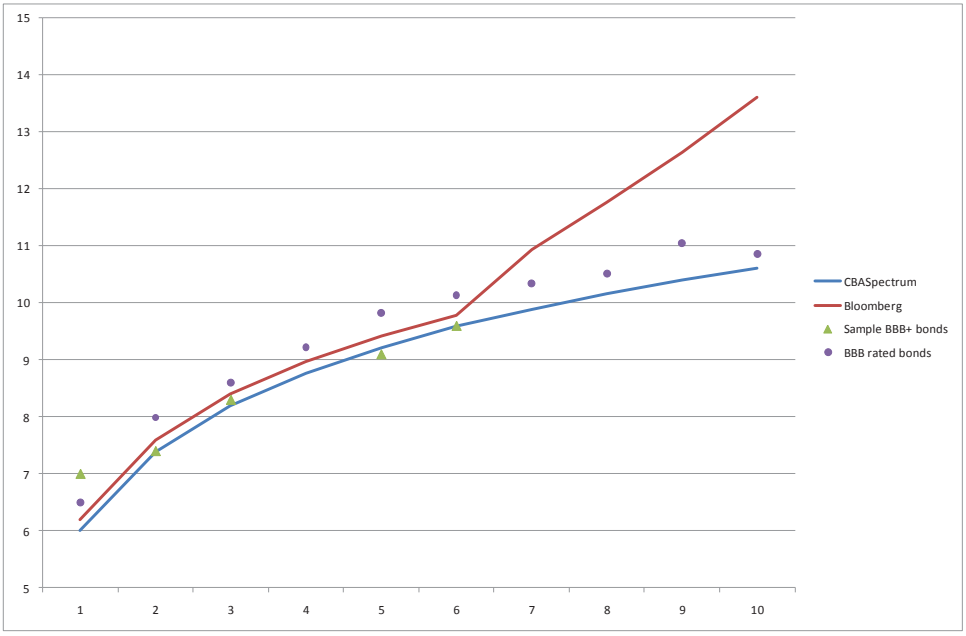
246. In this hypothetical example, the floating rate bond data provides a direct way of testing the accuracy of the curves beyond 6 years. This is valuable because it is in this maturity range that the NER requires an estimate to be made (which is generally true) and because, in this example, it is beyond 6 years when the material divergences between the curves begin.

B.10.3. Including bonds with credit ratings other than BBB+

247. Continuing with the same hypothetical example, imagine that there were no yields on floating rate notes available but that there were ten bonds with a credit rating of BBB that met the remainder of the AER's sample selection criteria (eg, not outliers and

issued by Australian companies in Australia). Now also imagine that when plotted on the graph in Figure 16 they looked as follows.

Figure 18: Including BBB rated fixed coupon bonds



Source, CEG analysis. All numbers underlying the above graph are hypothetical

248. Once again, the information embodied in the BBB rated bonds is very valuable in distinguishing between the Bloomberg and CBASpectrum fair value yields in this hypothetical example. As illustrated, at maturities of less than 6 years the BBB bonds yields are everywhere above the estimated BBB+ fair value curves. This is to be expected as BBB bonds should, other things equal, trade at a higher yield to the relatively lower risk BBB+ bonds.

249. However, beyond 6 years the observations for BBB bonds remain above the CBASpectrum BBB+ fair value estimate (as would be expected) but are below the Bloomberg fair value curve. Given that the BBB+ fair value curve should be below the yields on (most) BBB rated bonds then this is relevant evidence in favour of selecting the CBASpectrum fair value curve as the most accurate in this hypothetical example.

250. We note that both Bloomberg and CBASpectrum already use the yield on bonds other than BBB+ to derive their fair value curves. Bloomberg uses the yield on bonds rated BBB- to BBB+ to derive its BBB fair value curve. Both Bloomberg and CBASpectrum ensure that their fair value curves never cross – which means that fair value curves are not determined independently of the observed yields on differently rated bonds. We

also note that AER has in the past used the A rated yield curve to determine the shape of the BBB yield curve. These are all examples of using the information embodied in bond yields from one credit rating to determine the fair value of bond yields with a different credit rating.

B.10.4. Minimising exclusions of fixed rate BBB+ bonds

251. An important reason why the AER sample size is so small is that the AER excludes any bond that does not have a yield estimate available from all of the following three sources:

- UBS rate sheets;
- CBASpectrum; and
- Bloomberg BGN estimates.

252. Thus, if a bond has an estimated yield available from UBS and CBASpectrum but not from Bloomberg BGN it is excluded from the sample. The effect of this is that the information embodied in the UBS and CBASpectrum yield estimates is also discarded. It is worth noting that Bloomberg BGN has the lowest level of coverage out of the three data sources. Thus, the primary effect of the criteria that bonds be covered by all sources is to exclude bonds that do not have a Bloomberg BGN. Bloomberg reports estimated yields from its contributors for a much larger range of bonds than it reports BGN yields. It is unclear the basis on which Bloomberg chooses to determine a BGN yield for a given bond or how that BGN yield is determined from its contributors.

253. In order for the current '3 sources of yield estimates' criteria to be justified there must be a strong reason to believe that bonds that have BGN yield estimates are more relevant to an assessment the NER cost of debt than bonds that have yield estimates available from only one or both of UBS and CBASpectrum. We note that the AER methodology already has a separate process for identifying and excluding outliers. We also note that this process has excluded an outlier that did have yield estimates from each of the 3 sources (ie, BBI). Thus, failure to have representation from all three sources is presumably not intended as a filter to exclude outliers.

254. We also note that the fact that the basis on which Bloomberg selects bonds to be assigned BGNs nor how it arrives at those BGN yields is unknown to us. This suggests that to use the existence or otherwise of a BGN yield should not form a basis for whether yield estimates on a particular bond are relevant.

255. If we include all BBB+ fixed rate bonds that have a yield estimate available from one of the three sources currently used by the AER, then the sample of available bonds increases significantly (although not at the long maturity end). This is demonstrated in the table below in relation to the Country Energy draft decision averaging period where the AER's six bonds (including BBI) are shaded and a further 10 BBB+ bonds are available.

Table 8: Yields on all fixed rate BBB+ bonds

Issuer	Maturity
DB RREEF	4-Feb-10
SNOWY (W)	25-Feb-10
CHALLTREAS	23-Apr-10
GPT	7-Nov-10
BKQLD	2-Dec-10
DB RREEF	8-Feb-11
ORIGINERGY	6-Oct-11
TABCORP	13-Oct-11
AMEX	5-Dec-11
COLESMYER	25-Jul-12
SNOWYHYDRO	25-Feb-13
WESFARMERS	11-Sep-14
GPT	22-Aug-13
SANTOS	23-Sep-15
BBIDBCTFIN	9-Jun-16
AXA	26-Oct-16

Source: UBS rate sheets, CEG analysis

256. It can be seen that relaxing the requirement that a bond have a yield estimate from all three sources more than doubles the number of fixed rate BBB+ bonds in the UBS sample.

257. Currently the AER performs its test three times (one for each data source). This means that including bonds with yields from one source but not another will make the samples of bonds different in each test. We would not consider this problematic. We also note that it is not obvious why performing three tests with three different sets of data is better than rather than simply taking an average of the data from all sources and performing a single test. For example, if a bond had yield estimates for UBS and Bloomberg but not CBASpectrum (as is the case with the Origin bond above) then it would nonetheless be included in the test at a value equal to the average of the Bloomberg and UBS yields.

B.10.5. Bonds issued by Australian companies overseas

258. Another source of potential information is the yield on bonds issued by Australian companies denominated in overseas currencies. The yields on these bonds are slightly more problematic to convert into equivalent domestic yields because an adjustment must be made for expected movements in exchange rates. However, there are derivative markets that can be used to determine the AUD interest rate an issuer would incur if they issued debt overseas and then hedged exchange rate risks over the life of the bond.

259. In periods when new issuance into the Australian market is non-existent and the only bonds issued by Australian firms are into foreign markets, then it would appear appropriate to give the cost of issuing debt in this fashion at least some weight in determining the Australian benchmark rate under the NER.

B.10.6. Bonds issued by foreign companies into Australia

260. The AER determines that bonds issued by foreign companies into Australia should not be included in any assessment of the Australian BBB+ 10 year cost of debt.

261. In a modern globalised economy it is difficult to conceive of a meaningful 'bright line' between an 'Australian company' and a 'foreign company'. For example, American Express has recently issued BBB+ debt in Australia. American Express has Australian operations (serves Australian customers and earns income in Australian dollars) which is likely a factor in it choosing to issue debt in Australia (just as the fact BHPB and Rio Tinto earn most of their income in US dollars is likely a factor in why they issue hardly any Australian dollar denominated debt).

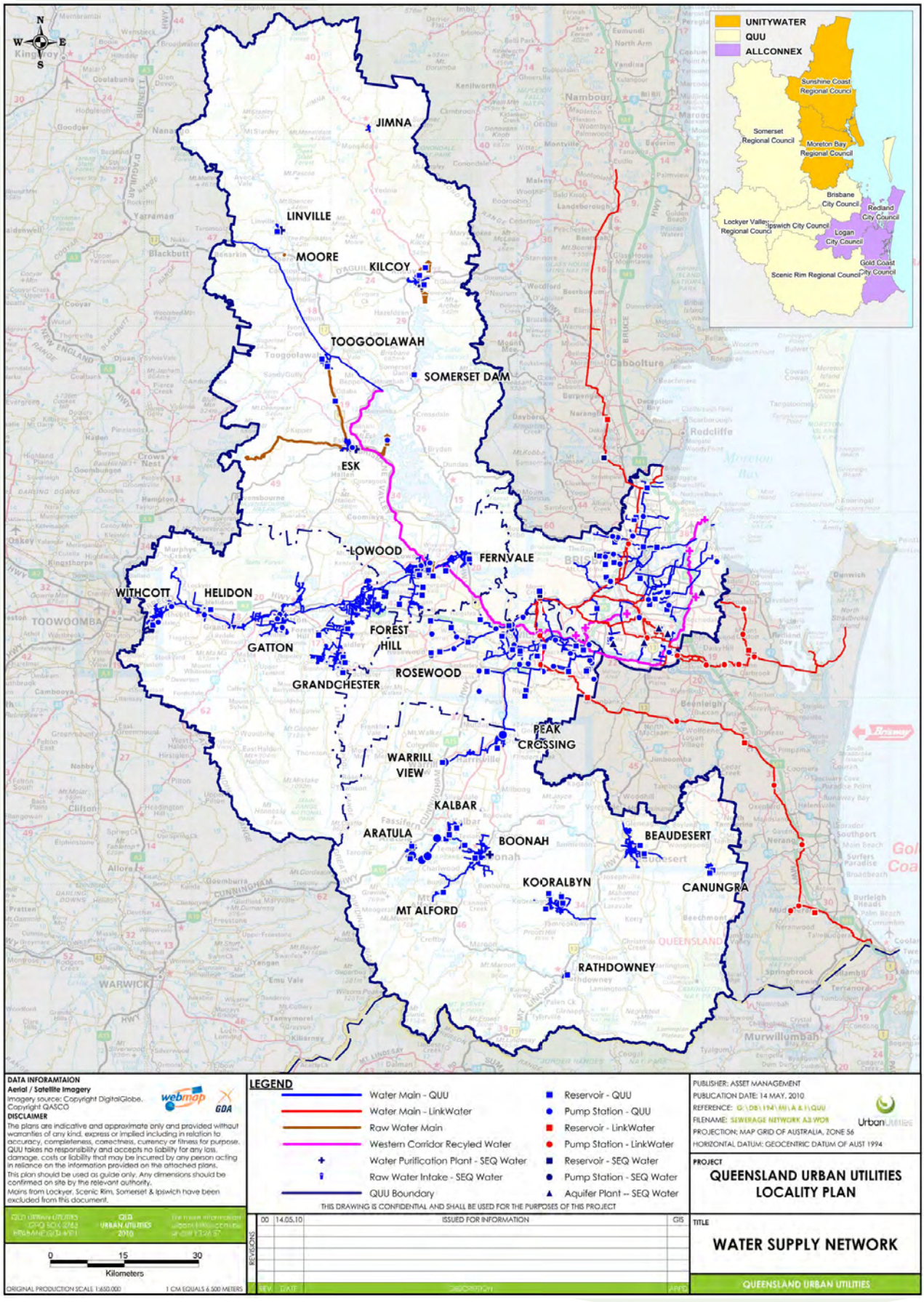
262. However, let us assume that we can distinguish between 'Australian' and 'foreign' companies in a meaningful way. Also, let us assume that BHPB is an 'Australian company' and that Anglo American (a diversified mining company of similar size to BHPB with operations in Australia and overseas) is 'not Australian'. Now imagine that both BHPB and Anglo American issued BBB+ rated debt in Australia. There is no obvious reason for assuming that the yield investors would demand on that debt would be higher or lower for the foreign firm. That is, the yield on Anglo American debt would likely be an unbiased estimator of the yield on BHPB debt (both would be rated BBB+ and both would be issued by similar firms). In our view, it would be appropriate to give the same weight to the yield on Anglo American debt as one would give to BHPB debt.

263. For the same reason we consider that the yield on the American Express debt listed in Table 8 above should not be excluded from consideration because it is issued by what is deemed to be a 'foreign company'. Of course, it could still be excluded on the grounds that it is an outlier if there were evidence to support that view. As it is, the Amex yield is almost exactly half way between the CBASpectrum and Bloomberg fair value curves at the relevant maturity - so there would not appear to be any obvious grounds for treating this bond as an outlier.

ANNEX 5: WATER SUPPLY NETWORK

WATER SUPPLY NETWORK

Water system map shows key features of the existing major transportation networks

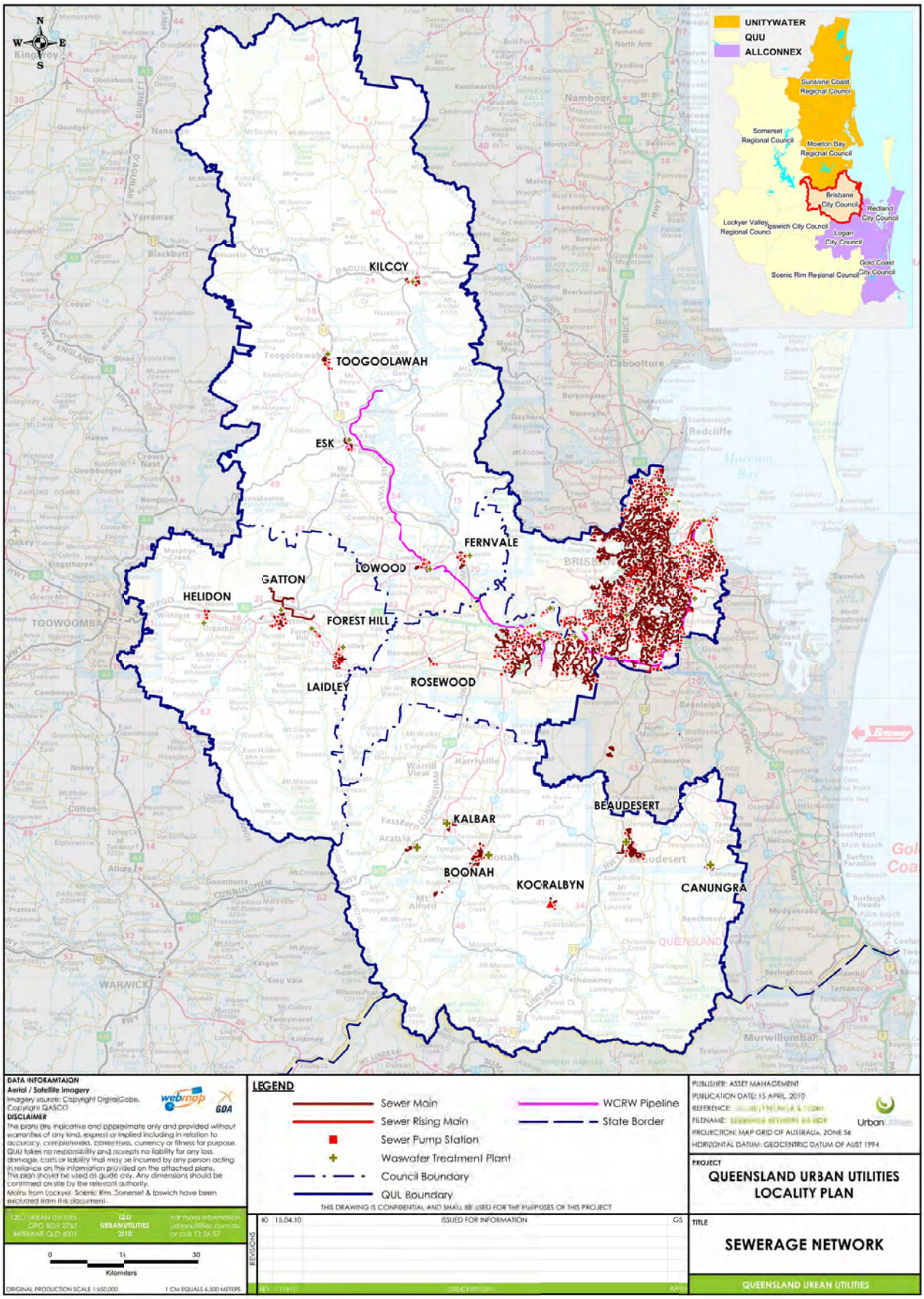


ANNEX 6: SEWERAGE NETWORK


Somerset
Regional
Council
Brisbane
City Council
Lockyer Valley
Regional
Council
Ipswich
City Council
Scenic Rim
Regional
Council

SEWERAGE NETWORK

Sewerage system map shows key features of the existing major sewerage transportation networks and treatment



ANNEX 7: CAPITAL PRIORITISATION (RISK ASSESSMENT) GUIDELINES

CAPITAL PRIORITISATION (RISK ASSESSMENT) GUIDELINES

WHY IS CAPITAL PRIORITISATION IMPORTANT?

Capital prioritisation is important for a number of reasons.

- To ensure a financially responsible spend profile that provides services at optimal timing and minimum cost.
- To result in an affordable program that will meet Queensland Urban Utilities' pricing and borrowing policies.
- To develop a program that will be justifiable to the pricing and asset regulators and able to sustain review.
- To develop a program that is deliverable.

CAPITAL PRIORITISATION METHODOLOGY

The capital prioritisation process addresses a number of issues.

- Ongoing projects – where there is a contractual commitment or approved funding is in place.
- Rolling programs – where some level of funding is desired every year.
- New projects – an evaluation of risk of deferral is carried out. In this process both the likelihood and consequence of deferral are evaluated. The following diagram illustrates the capital prioritisation process.
- Customer service.
- Regulatory.
- Growth.

The output of this process will be a list of projects with a financial affordability threshold for consideration by the Establishment Committee.

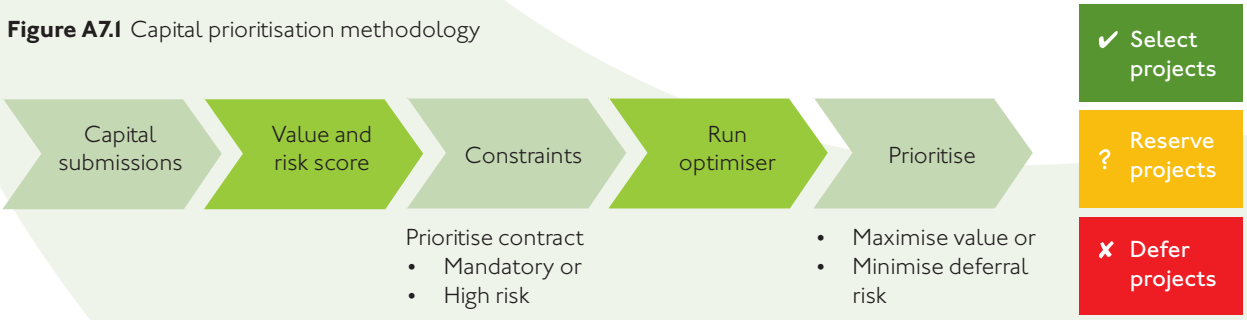
CAPITAL PROJECT PRIORITISATION FORMULA

The qualitative risk associated with not funding the project is calculated by multiplying the associated scores for likelihood and consequences. The largest of the three calculated risk scores is then used for project prioritisation purposes.

Projects are then ranked as follows:

- contractually committed projects first (in prioritisation score order)
- ongoing projects not yet contractually committed second (in prioritisation score order)
- rolling programs (in prioritisation score order)
- new projects (in prioritisation score order)
- deferred/cancelled projects.

Figure A7.1 Capital prioritisation methodology



ANNEX 8:
MINUTES EXTRACT

MINUTES EXTRACT

The Board:

resolved to sign a *Directors Responsibility Statement* in relation to the submission, and further resolved that in the opinion of the Directors of Central SEQ Distributor-Retailer Authority trading as Queensland Urban Utilities:

a) the Price Monitoring Information Return set out in the attached *QCA Data Template* is drawn up so as to fairly represent in accordance with the requirements of the Queensland Water Industry Information Requirements issued by the Queensland Competition Authority (information Requirements):

   i. information required by the Information Requirements;

   ii. information required on related party transactions required;

   iii. information on third party transactions required by the Information Requirements; and

b) the terms and definitions used in this statement accord with the definitions set out in the Information Requirements.

QUEENSLAND URBAN UTILITIES – TAKING CARE OF YOUR WATER AND WASTEWATER NEEDS

QUEENSLAND Urban Utilities

Queensland Urban Utilities is a trading name of the Central SEQ Distributor - Retailer Authority ABN 86 673 835 011.

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