Final Report

Inquiry into Tariffs of the Water Corporation, Aqwest and Busselton Water

14 August 2009

Economic Regulation Authority
WESTERN AUSTRALIA

Executive Summary

The Authority is pleased to present its recommendations on the tariffs for the Water Corporation, Aqwest and Busselton Water.

The inquiry was undertaken in response to a request by the Treasurer in July 2008. It is the second such inquiry that the Authority has undertaken. The previous inquiry was completed in 2005.

The recommendations take into account the views expressed by interested parties in written submissions and in a roundtable. Two opportunities for written submissions were provided: one in response to an issues paper and the other in response to a draft report. In total, 14 submissions were received from interested parties. The Authority wishes to thank those who provided the submissions and those who participated in the roundtable.

If the recommendations were implemented, the difference between what customers currently pay and what they would pay in 2012/13 is shown in Table 1.1 (the average annual dollar increase or decrease is shown in the second to last column of the table).

The impacts shown in Table 1.1 largely reflect the increase or decrease in the cost of providing the service to each class of customer. However, some of the impacts can also be explained by changes that more accurately allocate costs between residential and commercial customers (for example, the payment variations to commercial water customers in the country).

The Authority's recommendation is for a 10 per cent increase in the average Perth household water bill for each of the next three years (between 2009/10 and 2012/13) and a 2 per cent increase in the average Perth household wastewater bill (for each of the next three years). The total impact on an average Perth household would be a 5 per cent increase in the combined water and wastewater bill for each of the next three years.

Although not shown in Table 1.1, the average Water Corporation residential drainage customer would also pay an additional $17 in 2010/11 under the recommendations (increasing their annual payments from $70 to $87 per year in real dollars of June 2009).

Table 1.1 Impacts of Recommendations on Average Annual Payments for Water Corporation, Aqwest and Busselton Water Customers (Real Dollars of June 2009)

	Average Annual Payment		Average Annual Variation (2019/10 to 2012/13)	
	2009/10	2012/13	$	%
Household Water Bills				
Water Corporation, Perth	416	553	45	10%
Water Corporation, Country	500	598	33	6%
Aqwest, Bunbury	273	306	11	4%
Busselton Water	338	376	13	4%
Household Wastewater Bills				
Water Corporation, Perth	548	579	10	2%
Water Corporation, Country	553	632	26	5%
Total Household Water and Wastewater Bills				
Water Corporation, Perth	965	1,132	56	5%
Water Corporation, Country	1,053	1,230	59	5%
Commercial Water Bills				
Water Corporation, Perth	1,341	1,522	61	4%
Water Corporation, Country	8,678	7,775	-301	-4%
Aqwest, Bunbury	1,587	1,429	-53	-3%
Busselton Water	655	457	-66	-11%
Commercial Wastewater Bills				
Water Corporation, Perth	1,473	1,554	27	2%
Water Corporation, Country	1,105	1,153	16	1%
Total Commercial Water and Wastewater Bills				
Water Corporation, Perth	2,813	3,077	88	3%
Water Corporation, Country	9,783	8,928	-285	-3%

Water Tariffs in Perth

A water bill consists of a water usage charge and an annual fixed charge. A considerable part of the inquiry has involved establishing the value of water in Perth. This value is used to guide the setting of water usage charges. In total, the fixed charge and the water usage charge is set to ensure the water businesses recover the costs that have been efficiently incurred in providing the water service.

Water Corporation proposed that usage charges for Perth residential customers be set at $1.28 per kL up to 150 kL, $1.70 per kL from 151 kL to 500 kL and $2.03 per kL above 500 kL (in real dollar values of 2009). Perth commercial customers would be charged $1.70 per kL.

The Authority's recommendation is that usage charges for Perth residential customers be transitioned by 2012/13 to $1.40 per kL up to 150 kL, $1.83 per kL from 151 kL to 500 kL and $2.15 per kL above 500 kL (in real dollars of June 2009). Perth commercial customers would be transitioned by 2012/13 to $1.83 per kL. All values are in real dollars of June 2009.

The range of usage charges in the Authority's recommendation reflects the values of water as proposed by the Water Corporation (adjusted for inflation). However, the Authority has added an additional amount ($0.12 per kL) to reflect the cost of pumping water to customers.

Given that the recommended usage charges are significantly higher than current usage charges, the Authority recommends a substantial reduction in the annual fixed charge (the fixed charge is gradually reduced from $195.74 in 2009/10 to $79.59 in 2012/13, in real dollar values of 2009).

The Authority has made its recommendations after considering a range of options and concluding that the impacts of the recommendations are preferable to the impacts associated with other options (for example, after considering the impacts that each option would have on low water users, large households, tenants and pensioners).

Water Tariffs in Bunbury and Busselton

The Authority's recommendation is that usage charges for Bunbury residential customers be transitioned by 2012/13 to $0.56 per kL up to 150 kL, $1.05 per kL from 151 kL to 350 kL, $1.49 per kL from 351 kL to 500 kL, $1.98 per kL from 501 kL to 700 kL and $2.15 per kL above 700 kL. The annual residential fixed charge would be reduced from $101.58 in 2009/10 to $79.59 in 2012/13. Commercial customers in Bunbury would be charged $1.49 per kL. All values are in real dollars of June 2009.

For Busselton, the Authority's recommendation is that usage charges for residential customers be transitioned by 2012/13 to $0.86 per kL up to 150 kL, $1.20 per kL from 151 kL to 350 kL, $1.32 per kL from 351 kL to 550 kL, $1.59 per kL from 551 kL to 750 kL and $2.15 per kL above 750 kL. The annual fixed charge for Busselton residential customers would be reduced from $134.28 in 2009/10 to $79.59 in 2012/13. Commercial customers in Busselton would be transitioned to $1.32 per kL by 2012/13 (all values are in real dollars of June 2009).

The recommended residential tariffs for Aqwest and Busselton Water are based on the existing tariff structures with the following modifications:

- The number of tariff tiers is reduced to five (from the current six for Aqwest and eight for Busselton Water) by capping the usage charges at the highest recommended charge for Perth.
- The residential fixed charge is transitioned by 2012/13 to the Perth residential fixed charge.

Residential Wastewater Tariffs in Perth

The Water Corporation has proposed that the current wastewater pricing approach, which is based on gross rental values, be replaced with an average fixed charge. Under the gross rental value method, there is little if any relationship between the price charged and the cost of the service and the correlation between property values and income is not strong (25 per cent of lower-income households are in above-average valued properties).

The Authority supports this approach, which is more cost-reflective than property-based prices and would be simple to implement. A transition period of three years is likely to be required to minimise financial impacts on customers (particularly for customers currently in relatively low valued properties).

Tariffs for Water Corporation's Country Customers

The Authority is conscious that the Water Corporation is currently implementing a set of complex reforms to country water pricing. However, the Authority considers that the current reforms should be amended to change the uniform pricing policy to a tariff cap policy. Since the Authority last provided advice on country water pricing, the cost of water in Perth has significantly increased. If the uniform pricing policy were to be continued, many residential customers in low cost country towns would pay charges significantly higher than the costs of providing the water service.

The Authority also considers that the current threshold for applying fully cost reflective usage charges in the country is too high and that the threshold should be lowered (from 950 kL to 550 kL in the South of the State and from 1150 to 750 kL in the North of the State). The recommended thresholds are higher than the volume of water that would typically be used by households with six members. Customers could avoid higher usage charges by lowering their water usage.

Drainage Tariffs

The Authority does not consider that the current drainage charging approach is fair or cost-reflective. Charges to the Water Corporation's customers are based on property values, with non-residential customers paying an amount that is disproportionate to their benefit. While two thirds of residential customers pay the same minimum fixed charge, the other one third pay much higher amounts based on their property value.

The Authority considers that a fairer and more cost-reflective approach is to charge developers the costs of expanding the drainage network and recover the remaining costs from the Water Corporation's drainage customers on the basis of land area. Residential customers would be charged a flat charge while non-residential customers would be charged on the basis of land area, in three tiers.

In future regulatory periods, it may be fairer if all Perth customers (including both Water Corporation and local government drainage customers) were to share the costs of the drainage systems that provide public benefits, such as expenditure on improving drainage quality. One approach for recovering the public benefits associated with drainage could be to have a drainage levy (itemised separately on the water bill) that applies to all Water Corporation water customers in Perth. The proceeds from this levy could be used to fund all public benefit-related drainage expenditure by service providers. However, as the Water Corporation has not proposed expenditure on improving drainage quality, this change has not been recommended by the Authority.

Issues of a Technical Nature

In determining the recommended tariffs outlined above, the Authority has reviewed a number of technical aspects of the three water service providers' current operations and charging approaches. These issues are covered in detail in the report. The major recommendations are:

- The tariffs of the Water Corporation, Aqwest and Busselton Water should be set for a three-year regulatory period, and no longer be revised on an annual basis (other than to adjust for inflation).
- The Water Corporation should continue to endeavour to achieve reductions in its real operating costs per connection (for its base operations) of 1.88 per cent per year, which is the same efficiency target as has been applied for the last three

years and which has been achieved by the Water Corporation. The operating efficiencies being targeted by the Water Boards are considered appropriate.

- The Water Corporation's proposed operating expenditure to improve levels of service to customers and proposed capital expenditure should be used to set tariffs for the regulatory period.
- For Water Corporation, the rate of return (pre-tax real) should be increased from 5.63 per cent to 6.62 per cent. For Aqwest and Busselton Water, the rate of return should be increased from 5.87 per cent to 7.14 per cent.
- The initial regulatory asset values for Aqwest and Busselton Water be set at $30.4 million and $20.5 million respectively (as at 30 June 2008, in real dollar values of 2009). The initial regulatory asset value for Water Corporation was set following the previous review and should not be revised.
- The annual fixed charge should be the same for all small-use water customers, whether they are residential or small business customers. Wherever a 20mm meter is used to provide water, the fixed charges should be the same for all customers. The fixed charge should then increase as meter capacity increases.
- The current subsidies to public and charitable institutions for water and wastewater services should be either funded by a Community Service Obligation (CSO) payment or discontinued, rather than be paid for by other customers. For the purpose of this report, it has been assumed that these subsidies are funded by a CSO.

Summary of Recommendations

Water Charges for Perth, Bunbury and Busselton

1) Following consideration of a number of options, the Authority recommends that water tariffs for Perth residential customers be set as follows:

   a) the first tier usage charge (up to 150 kL) for 2012/13 be set at the lower estimate of the expected value of long run marginal cost (LRMC) at 2012/13 plus the marginal cost of distributing water;

   b) the second tier usage charge (between 150 kL and 500 kL) for 2012/13 be set at the upper estimate of the expected value of LRMC at 2012/13 plus the marginal cost of distributing water;

   c) the third tier usage charge (above 500 kL) for 2012/13 be set at the price that is likely to achieve the amount of water savings from two day per week sprinkler restrictions (estimated at $2 per kL) plus the marginal cost of distributing water;

   d) the annual fixed charge for 2012/13 be set at the value that causes an (approximately) equal average annual per cent change in water payments over the next ten years in order to balance revenue with costs; and

   e) the tariffs for 2010/11 and 2011/12 be set to transition smoothly to the recommended tariffs in 2012/13.

2) Water tariffs for Perth commercial customers be set as follows:

   a) the usage charge for 2012/13 be set at the second tier usage charge for residential customers;

   b) the usage charges for 2010/11 be aligned to a single usage charge for all commercial customers;

   c) the annual fixed charge for small-use commercial water customers (those using a 20mm meter) for 2012/13 be set at the annual fixed charge for residential customers;

   d) meter-based fixed charges increase with (the square of the) meter size; and

   e) the tariffs for 2010/11 and 2011/12 be set to transition smoothly to the recommended tariffs in 2012/13.

3) Tariffs for Aqwest and Busselton Water customers be set as follows:

   a) current residential usage charges be increased on an annual basis in proportion to the average annual increase in costs, subject to a cap set at the highest usage charge in Perth;

   b) the annual fixed charge for residential customers for 2012/13 be set at the level of the annual fixed charge in Perth for 2012/13;

c) usage charges for commercial water customers for 2012/13 be set at the third tier usage charge for residential customers;

d) the annual fixed charge for small-use commercial water customers (those using a 20mm meter) for 2012/13 be set at the annual fixed charge for residential customers;

e) meter-based fixed charges be set to increase with the square of the meter size;

f) the tariffs for 2010/11 and 2011/12 be set to transition smoothly to the recommended tariffs in 2012/13.

Water Corporation's Country Water Charges

4) The uniform pricing policy be changed to a tariff cap policy to avoid customers in low cost country towns paying charges higher than the cost of providing the water service.

5) The threshold above which fully cost-reflective usage charges apply to country residential customers be lowered from 950 kL to 550 kL in the South and from 1,150 to 750 kL in the North.

Water Corporation's Wastewater Charges

6) Residential wastewater charges be no longer based on property values but instead be based on an annual average fixed charge.

7) The transition away from property valuation-based residential wastewater charges be over a period of three years.

8) The current fixture-based method of charging non-residential customers for wastewater services is appropriate.

Water Corporation's Drainage Charges

9) Developers be charged the costs of any drainage infrastructure that is required to service developments (with the developer charge based on the average costs to the Water Corporation of expanding the drainage network over the last 10 years).

10) Residential and commercial customers (within the main drainage system provided by the Water Corporation) in Perth be charged the residual costs of drainage that remain after the costs attributed to developers have been deducted.

11) Customers within the Water Corporation's main drainage system in Perth be charged for drainage on the basis of land area.

a) All residential customers, plus non-residential drainage customers with land area less than 1,000 square meters, be charged $87.21 per year.

b) Non-residential drainage customers with land area from 1,000 square meters to 10,000 square meters be charged $436.04 per year.

c) Non-residential drainage customers with land area above 10,000 square meters be charged $872.07 per year.

12) The proposed drainage charges be introduced in 2010/11 and then be held constant in real terms.

13) In future, any expenditure on drainage quality be recovered through a levy on all of the Water Corporation's water customers in the scheme.

14) The costs incurred by the Water Corporation in providing drainage services in the six rural drainage districts be passed on to local councils in a cost reflective manner.

Water Corporation's Other Tariffs

15) Where practical, charges for minor tariffs associated with water, wastewater and drainage services should reflect the efficient costs of service.

16) Non-standard charges associated with metropolitan standpipes, industrial waste discharge to sewers, and specific services relating to industrial waste are set in a way that reflects costs and are therefore appropriate.

17) Additional charges (or discounts) on delayed (or early) payments reflect the costs to Water Corporation of delayed payment. However, the Authority recommends that the penalty rate on overdue accounts be reduced from 13.99 per cent to no higher than 1 per cent above the nominal cost of debt in the weighted average cost of capital calculation, to reflect more closely the cost of debt.

18) Subsidies to public and charitable institutions for water and wastewater services be either funded by a CSO or discontinued, rather than paid for by other customers. For the purpose of this report, it has been assumed that these subsidies are funded by a CSO.

19) Residential caravan bays be charged the standard residential fixed charges for water and wastewater services.

20) Water usage charges for farmland, local government standpipes and stock watering be set cost reflectively, and include a quota for residential use set at residential prices, with commercial pricing for usage above the quota.

21) Small mining customers be charged for water usage at the country non-residential tariffs.

22) Wastewater charges for non-residential vacant land be based on a fixed charge, and the additional GRV-based component removed.

Method Used to Determine Revenue Requirements for Each Service Provider

23) The tariffs of the Water Corporation, Aqwest and Busselton Water be set for a three-year regulatory period, and no longer be revised on an annual basis (other than to adjust for inflation).

24) The Water Corporation be able to retain, for the length of the regulatory period, any operating expenditure savings that are greater than the savings required to achieve the operating expenditure efficiency target.

25) Reviews of service standards for Water Corporation, Aqwest and Busselton Water be aligned with, and incorporated into, tariff reviews.

26) Tariffs be escalated on an annual basis in line with the annual increase in the eight city average Consumer Price Index.

27) For the purpose of calculating revenue requirements, gifted assets be excluded from the calculation and cash contributions be offset against capital expenditure in the year in which the cash contributions are received. However, any revenue adjustment associated with changing the regulatory accounting treatment of developer contributions would not commence until the next regulatory period (and would then be recovered in a similar manner to the recovery of capital expenditure, over the average life of the Water Corporation's capital expenditure).

28) CSO payments be set for a three year regulatory period using the same financial model used to calculate tariffs.

Operating and Capital Costs

29) Water Corporation's revenue requirement be set on the basis of reductions in base real operating costs per connection of 1.88 per cent per year.

30) Water Corporation's revenue requirement be set on the basis of its projected increases in operating costs to achieve level of service improvements.

31) Water Corporation's revenue requirement be set on the basis of its capital expenditure projections.

32) Customers should not pay for any premium associated with the Water Corporation's strategy to procure up to 20 per cent of the energy requirements of the Southern Seawater Desalination Plant from renewable energy sources that are untested at a commercial scale.

33) Aqwest's and Busselton Water's revenue requirements be set on the basis of their operating and capital expenditure projections.

Rate of Return

34) For Water Corporation, the rate of return (pre-tax real) be set at 6.62 per cent.

35) For Aqwest and Busselton Water, the rate of return (pre-tax real) be set at 7.14 per cent.

36) The rates of return for Water Corporation, Aqwest and Busselton Water should be updated in 2010 prior to the tariffs being set for the regulatory period.

37) The initial asset values used for the purpose of determining tariffs be set at $30.4 million for Aqwest and $20.5 million for Busselton Water (as at 30 June 2008, in real dollar values of 2009).

38) The initial regulatory asset value for Water Corporation should not be revised.

Efficiency of Demand Management Activities

39) Demand restrictions be reconsidered once the Southern Seawater Desalination Plant is operational.

Wastewater Cost Allocation

40) The uniform approach to charging metropolitan and country commercial wastewater customers be continued for the next three years and reconsidered at the next regulatory review.

41) The cost of providing wastewater services within a scheme continue to be allocated between residential and commercial customers on the basis of existing relativities for the next three years and reconsidered at the next regulatory review.

Specific Tariff Recommendations for Each Service Provider

42) The tariffs of the Water Corporation, Aqwest and Busselton Water be set in accordance with the tariffs in Schedules 1, 2 and 3 of Appendix I.

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1 Introduction

The Treasurer of Western Australia gave written notice to the Economic Regulation Authority (**Authority**), on 9 July 2008, to undertake an inquiry into the tariffs of the Water Corporation, Aqwest and Busselton Water.

The inquiry has been referred to the Authority under Section 32 of the *Economic Regulation Authority Act 2003* (**Act**), which provides for the Treasurer to refer inquiries to the Authority on matters related to regulated industries (i.e. water, gas, electricity and rail industries).

1.1 Terms of Reference

The Terms of Reference for the inquiry are provided in Appendix A.

In accordance with the Terms of Reference, the Authority is to consider and report on:

- the appropriate charging structures and recommended tariff levels for the Water Corporation, Aqwest and the Busselton Water Boards' water supply services;
- the appropriate charging structures and recommended tariff levels for the Water Corporation's wastewater services;
- the appropriate charging structures and recommended tariff levels for the Water Corporation's drainage services; and
- the appropriate charging structures and recommended tariff levels for the Water Corporation's other regulated services.

The Authority must give consideration to, but will not be limited to, the following:

- the method used to determine the revenue requirements of each service provider;
- the operating and capital costs of providing services, with a focus on:
  - cost effectiveness in the supply of services; and
  - resources necessary to meet the required service standards.
- the appropriate rate of return on each service provider's assets;
- the efficiency of demand management activities;
- the impact of the recommendations on each service provider's net financial position;
- the impact of the recommendations on the Government's net financial position, in particular, net debt, dividends, tax equivalent payments and the level of Government funding (through Community Service Obligation Payments); and
- the environmental and social impact of the recommendations.

In undertaking the inquiry, the Authority recognises section 26 of the Act, which requires the Authority to have regard to:

- the need to promote regulatory outcomes that are in the public interest;
- the long-term interests of consumers in relation to the price, quality and reliability of goods and services provided in relevant markets;

- the need to encourage investment in relevant markets;
- the legitimate business interests of investors and service providers in relevant markets;
- the need to promote competitive and fair market conduct;
- the need to prevent abuse of monopoly or market power; and
- the need to promote transparent decision making processes that involve public consultation.

1.2 Background

This inquiry is the second major review of the Water Corporation's water and wastewater tariffs and the water tariffs of Aqwest and Busselton Water. It is the first major review of the Corporation's drainage tariffs. The requirement for external oversight of prices is a result of the Council of Australian Government's Water Reform Agreement (1994) and the National Water Initiative.

This inquiry follows a number of other inquiries carried out by the Authority into water-related issues in Western Australia.

- Water Corporation's tariffs for water and wastewater services in the Perth metropolitan area, and water tariffs set by Aqwest and the Busselton Water Board. This inquiry (2005) was the first independent inquiry into urban water and wastewater tariffs in Western Australia;
- the cost of supplying bulk water to Kalgoorlie-Boulder from Perth, either from Perth via the existing network, or transporting desalinated seawater from Esperance along a new pipeline (2005);
- Water Corporation's country water and wastewater tariffs (2006);
- the bulk water supply agreement between Harvey Water and the Water Corporation (2007);
- competition in the water and wastewater services sector (2008);
- developer contributions to the Water Corporation (2008); and
- pricing of recycled water (2009).

In addition to the major reviews of urban and country water and wastewater tariffs, the Authority has also carried out annual reviews of Water Corporation's tariffs (in 2007 and 2008). These annual reviews provided advice to the Government on the implications of the latest cost increases on the tariff structures that had previously been set by Government. The Authority has also undertaken (in 2008) an annual review of the tariffs charged by Aqwest and Busselton Water.

As a result of previous water and wastewater pricing inquiries, the government has implemented a number of changes to the Water Corporation's pricing structure.

- Metropolitan water usage charges are moving towards the (long run) marginal cost of future water sources (and at the same time, the fixed charge is being adjusted to ensure full cost recovery).
- The number of steps in the water tariff schedules for the Corporation (both residential and non-residential) are being reduced over time.

- Charges in country towns for water usage above the uniform threshold are being more closely related to the costs of providing the water service.
- All of the Corporation's water and wastewater tariffs are moving towards being set as closely as possible to the costs of delivering the service (subject to the uniform tariff policy and caps on wastewater charges).
- There has been no change in the water boards' pricing structures (the Government has deferred decisions on the water boards' pricing structures until the recommendations of this inquiry have been provided).[1]

The current inquiry fits in with the National Water Initiative (**NWI**) process which requires State Governments to use independent bodies to either set or review prices (or price setting processes) for water storage and delivery by government water service providers.[2] Prices must be consistent with the pricing principles set out in the NWI, including the requirement to remove or at least make transparent any cross subsidies. While the Authority does not have a formal function as a price regulator for water and wastewater services, it has indirectly performed this role through inquiries which result in tariff recommendations to the Government.

Other jurisdictions have independent regulators which regulate water and wastewater prices; the Independent Pricing and Regulatory Tribunal (**IPART**) in NSW, the Essential Services Commission of South Australia (**ESCOSA**), the Essential Services Commission (**ESC**) of Victoria, and the Independent Competition and Regulatory Commission (**ICRC**) in the ACT. These regulatory bodies set the maximum prices that can be charged by water and wastewater utilities for their services.

Water and wastewater services are generally provided by monopoly service providers. As such, there is a need for oversight of prices to ensure the businesses do not overcharge for their services. The approach taken in Western Australia has been for the Government to issue a Terms of Reference to the Authority to undertake an inquiry and provide recommendations on appropriate tariffs.

In making these recommendations, the Authority first establishes the efficient costs of the businesses. For a given forecast of demand, tariffs are then calculated to reflect the efficient recovery of costs. This approach is adopted individually for water, wastewater, drainage and other regulated services such that water tariffs reflect the costs incurred in providing water services, wastewater tariffs reflect the costs incurred in providing wastewater services and so on.

A more detailed description of the service providers and their current tariffs is contained in the Appendices.

- Appendix B presents an overview of the Water Corporation, Aqwest and Busselton Water Board.
- Appendix C outlines the current tariff structures for the three service providers.
- Appendix D sets out other regulated tariffs of the Water Corporation.

1.3 Structure of the Report

The report consists of three parts.

[1] Water boards refers to Aqwest (or the Bunbury Water Board) and the Busselton Water Board.

[2] Section 77 of the Intergovernmental Agreement on a National Water Initiative.

Part 1 presents recommendations of a general nature such as those relating to:

- water usage charges;
- wastewater charges; and
- drainage charges.

Part 2 presents recommendations that relate to technical issues such as:

- the method used to determine revenue requirements for each service provider;
- the operating and capital costs of providing services;
- the rate of return;
- demand management; and
- cost allocation between different customers groups.

Part 3 presents the specific tariff recommendations for each of the reviewed water businesses.

Part 4 presents the impacts of the tariff recommendations on customers and government finances.

1.4 Review Process

The recommendations of this inquiry have been informed by the following public consultation process:

- An Issues Paper was released on 4 August 2008 and six submissions were subsequently received.
- A Draft Report was released on 18 March 2009 and eight submissions were subsequently received.
- A roundtable to discuss the draft recommendations was held on 4 May 2009 with 30 stakeholders attending.
- The Treasurer twice amended the reference to extend the delivery date for the Final Report from 15 June 2009 to 17 July 2009, and then to 14 August 2009.
- The Final Report was presented to the Treasurer on 14 August 2009.
- The Treasurer, in accordance with the Act, is required to table this report in Parliament within 28 days of its receipt.

In accordance with section 45 of the Act, the Authority has acted through the Chairman and members in conducting this inquiry.

1.5 Further Information

Further information regarding this inquiry can be obtained from:

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PART ONE: GENERAL RECOMMENDATIONS

2 Water Charges for Perth, Bunbury and Busselton

2.1 Terms of Reference

This section contributes to addressing the following Terms of Reference.

> the Authority is to investigate and report on …
>
> - the appropriate charging structures and recommended tariff levels for the Water Corporation, Aqwest and the Busselton Water Boards' water supply services;

2.2 Recommendations

Recommendations

1) Following consideration of a number of options, the Authority recommends that water tariffs for Perth residential customers be set as follows:

   a) the first tier usage charge (up to 150 kL) for 2012/13 be set at the lower estimate of the expected value of long run marginal cost (LRMC) at 2012/13 plus the marginal cost of distributing water;

   b) the second tier usage charge (between 150 kL and 500 kL) for 2012/13 be set at the upper estimate of the expected value of LRMC at 2012/13 plus the marginal cost of distributing water;

   c) the third tier usage charge (above 500 kL) for 2012/13 be set at the price that is likely to achieve the amount of water savings from two day per week sprinkler restrictions (estimated at $2 per kL) plus the marginal cost of distributing water;

   d) the annual fixed charge for 2012/13 be set at the value that causes an (approximately) equal average annual per cent change in water payments over the next ten years in order to balance revenue with costs; and

   e) the tariffs for 2010/11 and 2011/12 be set to transition smoothly to the recommended tariffs in 2012/13.

2) Water tariffs for Perth commercial customers be set as follows:

   a) the usage charge for 2012/13 be set at the second tier usage charge for residential customers;

   b) the usage charges for 2010/11 be aligned to a single usage charge for all commercial customers;

   c) the annual fixed charge for small-use commercial water customers (those using a 20mm meter) for 2012/13 be set at the annual fixed charge for residential customers;

   d) meter-based fixed charges increase with (the square of the) meter size; and

   e) the tariffs for 2010/11 and 2011/12 be set to transition smoothly to the recommended tariffs in 2012/13.

3) Tariffs for Aqwest and Busselton Water customers be set as follows:

   a) current residential usage charges be increased on an annual basis in proportion to the average annual increase in costs, subject to a cap set at the highest usage charge in Perth;

   b) the annual fixed charge for residential customers for 2012/13 be set at

the level of the annual fixed charge in Perth for 2012/13;

c) usage charges for commercial water customers for 2012/13 be set at the third tier usage charge for residential customers;

d) the annual fixed charge for small-use commercial water customers (those using a 20mm meter) for 2012/13 be set at the annual fixed charge for residential customers;

e) meter-based fixed charges be set to increase with the square of the meter size;

f) the tariffs for 2010/11 and 2011/12 be set to transition smoothly to the recommended tariffs in 2012/13.

2.3 Reasons

Table 2.1 shows the Authority's recommended tariffs for the Water Corporation's metropolitan water customers.

Table 2.1 Recommended Water Corporation Metropolitan Residential and Commercial Water Tariffs (Real Dollars of June 2009)

	2009/10	2012/13
Residential Fixed Charge		
Fixed Tariff	195.74	79.59
Residential Demand Charge by Volume		
0 – 150	0.709	1.400
151 – 350	0.860	1.830
351 – 500	0.996	1.830
501 – 550	0.996	2.150
551 – 950	1.501	2.150
951 +	1.738	2.150
Commercial Fixed Charge by Meter Size		
20mm	453.02	79.59
25mm	707.95	124.36
30mm	1,019.73	179.08
40mm	1,811.88	318.36
50mm	2,831.61	497.44
80mm	7,249.46	1,273.44
100mm	11,326.43	1,989.75
150mm	25,484.47	4,476.94
200mm	45,306.70	7,959.00
250mm	70,791.17	12,435.94
300mm	101,939.83	17,907.75
350mm	138,750.73	24,374.44
Commercial Demand Charge by Volume (kL)		
0 – 600	1.144	1.830
601 – 1,100,000	1.192	1.830
over 1,100,000	1.180	1.830

The Authority considered a proposal by the Water Corporation to have three tiers of usage charges for residential customers, with the first tier equal to the value of water as represented by their lower estimate of the average (incremental) cost of adding more supply – referred to as "long run marginal cost" (**LRMC**) pricing) – the second tier equal to their upper estimate of LRMC, and the third tier equal to the per kL cost of desalination.

The Water Corporation's estimates of LRMC are estimates of what the LRMC would be in 2013. The Authority considers that this approach is appropriate because there is no reason in transitioning usage charges to reflect current estimates of LRMC, as these current estimates would be out of date by 2013. The recommended usage charges recognise that the value of water is likely to decline over the regulatory period ahead of

the introduction of the second desalination plant (the Authority has calculated that the current estimates of LRMC are significantly higher than the estimates of LRMC in 2013).

The main difference between the Water Corporation's proposal and the Authority's recommendation is that the Authority has recommended an additional amount be added to usage charges to reflect the marginal cost of distributing water. Efficient usage charges would be based on the value of the water as well as the electricity and treatment costs associated with getting that water to customers.

Another difference between the Water Corporation's proposal and the Authority's recommendation is the principle for setting the third tier usage charge. The Authority disagrees that the charge should be based on the cost of a desalination plant but rather on the price that is likely to achieve the amount of water savings from two day per week sprinkler restrictions. The Authority considers that this price is likely to be in the order of $2 per kL (which is also similar to the per kL cost of water from a desalination plant).

The Authority has concluded that over the next three years there is an environmental externality (external cost) associated with abstracting more groundwater than would ideally be taken if other sources were available. This environmental externality is estimated to range between $0.24 per kL and $0.33 per kL. However, the estimate of the value of water obtained using the method proposed by the Water Corporation is consistent with the Authority's estimate of the short term value of water inclusive of an environmental externality premium. In other words, no further adjustment to usage charges is necessarily required to incorporate an environmental externality premium into the recommended water usage charges.

For each service provider, the Authority considers that a three-year transition period to the recommended tariffs is appropriate given the extent of rebalancing between usage and fixed charges (for both residential and commercial customers in Perth and for commercial customers in Bunbury and Busselton).

The Authority has also concluded that the annual fixed charge should be the same for all small-use water customers, whether they are residential or small business customers. Wherever a 20mm meter is used to provide water, the fixed charge should be the same, with the fixed charge increasing as meter capacity increases.

Table 2.2 and Table 2.3 show the Authority's recommended tariffs for Aqwest and Busselton Water, respectively.

Table 2.2 Recommended Tariff Schedule for Aqwest Residential and Commercial Water (Real Dollars of June 2009)

	2009/10 (est)	2012/13
Fixed Charge		
Residential	101.58	79.59
Non-Residential by Meter Size (mm)		
20	379.96	79.59
25	592.89	124.36
40	1,521.78	318.36
50	2,378.39	497.44
80	6,090.06	1,273.44
100	9,515.53	1,989.75
150	21,411.41	4,476.94
Demand Charge by Volume (kL)		
Residential		
0 - 150	0.42	0.56
151 - 350	0.78	1.05
351 - 500	1.11	1.50
501 - 700	1.47	1.98
701 - 1000	1.77	2.15
Over 1000	2.59	2.15
Non-Residential by tranche		
0 – 1000	0.80	1.50
over 1000	1.18	1.50

Table 2.3 Recommended Tariffs for Busselton Residential and Commercial Water (Real Dollars of June 2009)

	2009/10 (est)	2012/13
Fixed Charge		
Residential	134.28	79.59
Non-Residential By Meter Size (mm)		
20	429.87	79.59
25	670.92	124.36
32	966.82	134.51
40	1,720.74	318.36
50	2,687.56	497.44
80	6,882.84	1,273.44
100	10,754.19	1,989.75
150	24,090.06	4,476.94
Demand Charge by Volume (kL)		
Residential		
0 - 150	0.54	0.86
151 - 350	0.75	1.20
351 - 550	0.83	1.32
551 - 750	1.00	1.59
751 - 1150	1.65	2.15
1151 - 1550	2.34	2.15
1551 - 1950	2.71	2.15
Over 1950	3.15	2.15
Non-Residential		
0 – 1000	0.97	1.32
Over 1000	1.37	1.32

The Authority did not receive explicit tariff proposals from Aqwest and Busselton Water although each service provider indicated they were relatively comfortable with their current tariff structures. The recommended tariffs for Aqwest and Busselton Water are based on a method broadly similar to the one used to calculate water tariffs for country towns served by the Water Corporation. The residential fixed charges have been set equal to the fixed charge in Perth. The usage charges are the current usage charges increased in proportion to the general increase in costs (but capped at the highest usage charge in Perth). Residential customers and small business customers pay the same fixed charge.

After considering a range of options the Authority has concluded that the impacts of the recommendations for each service provider are preferable to the impacts associated with other options (for example, after considering the impacts that the options would have on low water users, large households and tenants).

2.4 Background

Historically, water prices were either charged on a fixed annual basis or determined under a 'rates-based' approach. The price charged did not reflect the volume of water usage. In addition, the revenue raised typically bore little resemblance to the cost of providing the service.

The introduction of water meters allowed customers to be charged on the basis of usage. Prices were also set to reflect, more accurately, the cost of service provision. However, prices were typically set with little reference to efficient pricing principles.

Efficient prices for water and wastewater services serve two main functions:

- they will generate revenue for the water provider to cover the efficient costs of providing the services; and
- they will send signals to consumers of the services of the costs of service provision in order that these costs are properly taken into account in usage decisions.

Regulators including the Essential Services Commission (ESC) in Victoria and IPART in New South Wales have adopted LRMC pricing for usage charges.[3] The Authority has previously recommended that LRMC pricing be applied to metropolitan water customers.

LRMC pricing attempts to value water by calculating the cost consequences of an increase in per capita demand. In a sense, LRMC pricing is a form of externality pricing, where the price accounts for the consequences of one consumer's decision to use more water on the future charges that other users will have to pay.

The Government is implementing LRMC pricing for the Water Corporation's metropolitan customers and will consider doing so for the water boards' customers, pending consideration of the Authority's advice from this inquiry. For the Water Corporation's metropolitan customers, the implementation is over a period of eight years, concluding in 2013/14.

Following the Authority's advice, the Government announced as part of the 2008 budget that commercial metropolitan customers will have their usage charges phased-in by 2013/14 to a more recent (and higher) estimate of LRMC.

In the 2009 budget, the Government continued to apply the phase-in to metropolitan and country water charges that had previously been recommended by the Authority (in addition to an inflation adjustment of 4.2 per cent).

2.5 Proposals by Service Providers

Water Corporation has proposed the following metropolitan residential water usage charges (in real dollar values of 2009):

- $1.28 per kL for 1 to 150 kL per year;
- $1.70 per kL for 151 kL to 500 kL per year; and

[3] It should be noted that the reference to LRMC pricing in this context is different to the theoretical concept of LRMC. Theoretical LRMC refers to a situation where all factors of production are variable in the production of a given quantity. LRMC pricing in the sense that regulators have adopted is actually an incremental cost associated with the introduction of additional sources of supply.

- $2.03 per kL for water usage above 500 kL per year.[4]

For non-residential water usage charges, the Water Corporation has proposed that the middle usage charge, $1.70 per kL, be applied.[5]

The Water Corporation has based its proposals on two sources. The first is its LRMC model, which produces a lower estimate of $1.28 per kL and an upper estimate of $1.70 per kL. The second source of information is the cost of the Southern Seawater Desalination Plant, powered by renewable energy (approximately $2.00 per kL in real dollars of 2008).

Aqwest indicated that the following pricing principles should guide the setting of water usage charges:

> a) Residential – six (6) tier consumption scale rewarding those customers who conserve water. Annual supply fee.
>
> b) Non Residential – two (2) tier consumption scale. Annual supply fee based on meter size.
>
> c) (a) and (b) to be at sufficient levels to return realistic and sustainable returns on asset investment.
>
> d) Long run marginal cost (LRMC) pricing appears flawed when applied to the water industry (see prior comments 2005 and 2007 Inquiries).
>
> (Aqwest, submission, p6)

Busselton Water provided the following submission:

> Busselton Water currently uses an 8 tier tariff band system. In relation to the scaling back of the number of bands, and although not totally opposed to a reduction in the bands, the Boards does object to such a severe reduction resulting in only 3 bands. With average residential consumption for Busselton at 275 kL/year, a proposed gap of 150-500 kL would not be conducive to encouraging consumers to conserve water. There is also no punitive effect for those who abuse the privileges of a quality water supply. (Busselton Water, submission on draft report, p3)

2.6 Assessment

The Authority's general approach to considering tariff proposals is that, unless there is good reason not to, the Authority will accept a service provider's proposals. The Authority's assessment of the proposals has involved consideration of a number of issues.

> d) Are the LRMC estimates provided by the Water Corporation reasonable estimates of the value of water? Consideration was given to the assumptions underlying the LRMC calculation and the appropriateness of LRMC as a measure of the value of water in comparison to other approaches.
>
> e) What are appropriate values of water in Bunbury and Busselton, and how should the water usage charges be structured in those locations?

[4] The Water Corporation's submission in response to the Draft Report actually proposed usage charges of $1.36 per kL, $1.80 per kL and $2.00 per kL. However, this proposal was revised following the identification of an error in the LRMC model.

[5] Water Corporation, submission on draft report, p2.

f) Should the water usage charge proposals by the service providers be adjusted to achieve social objectives?

2.6.1 Are the LRMC Estimates Provided by the Water Corporation Reasonable Estimates of the Value of Water?

The Authority has considered the appropriateness of the assumptions underlying the LRMC calculations. The assumptions can be grouped into the following categories:

- assumptions about the current and future demand for water;
- assumptions about the availability and cost of current and future sources, including any externality costs;
- assumptions about the level of security of supply; and
- assumptions about the period over which the LRMC calculation is undertaken.

Appropriateness of using LRMC as a measure of the value of water

The LRMC method applied by the Water Corporation attempts to measure the long term value of water by identifying the cost consequences of an increase in per capita demand. As indicated above, LRMC pricing is a form of externality pricing where the price accounts for the consequences of one consumer's decision to use more water on the bills that other users will have to pay at some point in the future.

The Water Corporation summarised the arguments for setting water usage charges on the basis of a long-term value of water:

> Pricing based on LRMC is well established in many jurisdictions in the water industry. This approach is supported by the premise that for reasons of efficiency, the LRMC:
>
> (i) Provides an efficient signal to users about the consequences of their water use by reflecting the long term cost of new source development;
>
> (ii) Allows users to signal their willingness to fund the construction of new sources;
>
> (iii) Guides the user to make an informed decision on the efficient development of alternative supplies and demand management initiatives by better understanding the cost of scheme supply.
>
> (Water Corporation submission on issues paper, p7)

The Department of Treasury and Finance also refers to the advantages of LRMC:

> there is an increasing understanding of LRMC as a "benchmark" cost of water which is important for the consideration of alternate mechanisms for saving water through efficiency measures. (Department of Treasury and Finance submission on issues paper, p4)

First, the Authority has considered the appropriateness of using LRMC as a measure of the value of water.

While the Authority acknowledges the advantages of LRMC pricing, there are issues with this approach. LRMC pricing was established as a method of smoothing price fluctuations in situations where additional capacity requirements are relatively predictable because they relate to predictable demand growth and relatively stable dam inflow patterns. More

recently, LRMC pricing has been applied in situations where additional capacity requirements are less predictable due to uncertain inflows into the dams. The resulting estimates of LRMC can therefore be relatively broad.

The Water Corporation's LRMC calculation for Perth water supply does not take into account the cost of the second desalination plant, because that project has already been committed and its timing is not impacted by a change in demand. The next source in the Water Corporation's LRMC model that can have its timing influenced occurs in 2019 (assuming demand continues at 145 kL per person, groundwater abstraction averages 120 GL, and the continuation of recent inflow levels). This LRMC estimate attempts to establish the consequences of a permanent variation in demand on future source developments (commencing ten years from now). The significant uncertainty around the identification of the next source (under the baseline assumptions) indicates the uncertainty surrounding any LRMC estimate.

Other issues with LRMC pricing include:

- the varying results obtained when calculating LRMC by using different variations in demand (e.g. by using decrements rather than increments and by using large rather than small variations in demand).
  - The upper estimate of LRMC calculated by the Water Corporation of $1.70 per kL is based on an increment in demand of 7 per cent. A decrement in demand of 7 per cent produces an estimate of $1.41 per kL.
- the varying results obtained between using the Turvey approach (used by the Water Corporation), in which the cost consequences of increments or decrements in demand are calculated and the average incremental cost approach (where the per kL cost of meeting demand growth is calculated); and
- the assumption of constant technological progress (noting that the cost of desalination technology is generally assumed to be constant, contrary to historical experience).

Overall, the Authority is aware of the shortcomings of the LRMC approach but acknowledges that this approach may still deliver the best estimate of the long term value of water. The Authority has given consideration to calculating the value of water over a shorter time frame using a different method (which will be discussed in the next section). The remainder of this section examines the assumptions made by the Water Corporation in calculating its LRMC estimates.

Assumptions about the Current and Future Demand for Water

For a given supply of water, the value of water increases with growth in demand. The demand for water is influenced by a number of factors, including population growth and average per capita demand.

The Water Corporation has based its LRMC calculation on the per capita demand that results from assuming a continuation of the current level of demand restrictions.

> [The Water Corporation's source development plan for pricing purposes assumes] per capita demand consistent with current actual demand under the 2 day per week sprinkler roster. (Water Corporation submission, p15)

The demand assumption that is relevant to determining the value of water is generally unrestricted demand, not restricted demand. While restrictions are typically put in place when the value of water is high; restrictions do not influence the value of water per se.

While the Water Corporation's LRMC estimate was calculated with the base case of restricted demand, it is understood that the LRMC estimate would not change significantly if the base case included unrestricted demand. This is because of the particular way that LRMC is calculated.[6]

A related issue is that the Water Corporation has undertaken three scenarios involving increments and decrements in demand. Specifically, the Water Corporation has calculated LRMC assuming a decrement in demand of 7 per cent and an increment in demand of 7 per cent. The 7 per cent figure is based on the percentage variation of average per capita demand from 145 kL to either 135 kL or 155 kL. It is reasonable to envisage that demand could increase or decrease by an average amount of 10 kL per person per year as this would reflect, for example, the variation between 2 day per week and 3 day per week sprinkler restrictions.

The Authority is satisfied that the demand assumptions underlying the LRMC calculation are acceptable.

Assumptions about Security of Supply

Security of supply has a long term component (i.e. when new sources should be developed) and a short term component (i.e. how much water should be provided for consumption in any particular year).

The LRMC model assumes that new sources are triggered in either of two ways: first, if the expected groundwater abstraction for the preceding three years exceeds 120 GL; and second if the probability of a total sprinkler ban exceeds 2 per cent (i.e. a 1 in 50 year chance of a total sprinkler ban).

The Authority considers that these assumptions regarding security of supply are appropriate.

In the calculation of LRMC, the Water Corporation includes the marginal cost of a total sprinkler ban. Given that the LRMC model is run over a period of 100 years and using 1,000 different inflow scenarios, total sprinkler ban events do occur (on average 0.4 per cent of the time for the scenario that results in the estimate of $1.70 per kL).

The LRMC calculation is therefore identifying not only the consequences of a variation in demand on the cost of the source development programme but also the consequences for the probability of a total sprinkler ban. The marginal cost of a total sprinkler ban calculated by the Water Corporation assumed a total sprinkler ban event will have a (direct and indirect) cost of around $20 per kL[7] and then by comparing the cost under the base case assumption of demand with the cost associated with a variation in demand. The marginal cost of total sprinkler bans is the difference between the cost of restrictions in the two cases.

The Water Corporation's upper estimate of LRMC, $1.70 per kL, includes $0.10 per kL for the marginal cost of total sprinkler bans, while its lower estimate of LRMC, $1.28 per kL, includes $0.01 per kL for the marginal cost of total sprinkler bans.

[6] In the particular form of LRMC pricing applied by the Water Corporation (the "Turvey approach"), it is the increment (or decrement) in demand relative to the base level of demand that is important, not the actual level of demand in the base case.

[7] There are higher costs associated with a sprinkler ban, including direct costs (e.g developing a 'waterwise' garden) and "opportunity" costs (e.g time spent having to use a hand-held hose).

The Water Corporation has not included in the LRMC model any cost for the greater risk of a total sprinkler ban that might eventuate from a demand increase that occurred prior to the introduction of the second desalination plant (in effect, the LRMC model assumes that any increase in demand occurs from 2013, which is after the second desalination plant is in place). If the model is changed to have the demand increase in 2010, the range of LRMC estimates becomes $1.20 - $1.88, which includes $0.02 and $0.40 respectively for the marginal cost of total sprinkler bans.

There are two matters regarding the modelling that require consideration. The first is whether it is appropriate to include the marginal cost of total sprinkler bans in the LRMC calculation. If so, the second matter is whether the Water Corporation has accurately incorporated the cost.

Conceptually, if the LRMC model were set up in an optimal way, and if all sources could be varied, then a variation in demand would change the timing of source development in a way that would maintain the probability to a total sprinkler ban at 2 per cent (1 in 50 year event). It would be expected that a demand variation would not result in an associated (marginal) cost for total sprinkler bans, but rather there would be change in the timing for new sources. However, in practice, the timing of some sources cannot be varied in an optimal way, either because some sources cannot be brought forward (such as the timing of the second desalination plant), or because of difficulties in designing the model to do this.

The Authority does not have a concern that the LRMC model includes the marginal cost of a total sprinkler ban because this inclusion attempts to adjust for a deficiency in the LRMC calculation largely caused by the inability to bring forward the timing of the next source. However, the Authority is concerned that the Water Corporation has not applied this cost consistently (by not including the marginal cost of a total sprinkler ban that would arise from a variation in demand prior to the introduction of the second desalination plant). The Water Corporation's approach may be an appropriate estimate of LRMC as at 2013, but it is not considered to be an appropriate estimate of the current LRMC.

The Authority considers that the current estimate of LRMC should be calculated by incorporating the marginal cost of restrictions that would result from a variation in demand commencing in 2010, rather than 2013 as assumed by the Water Corporation. With this adjustment, the range of LRMC estimates lies between $1.20 per kL and $1.88 per kL.

Assumptions about the Availability and Cost of Current and Future Sources (Including any Externality Costs)

The LRMC calculation requires assumptions about the availability and cost of dam water, groundwater and other sources. The relevant costs are the operating and capital costs and externality costs (where these have not already been mitigated through additional operating or capital expenditure).[8]

Availability and Cost of Dam Water

The assumption of dam inflows has a significant impact on the value of water because without large inflows, relatively inexpensive dam water becomes scarce, requiring the development of more expensive water sources.

[8] In the context of this inquiry, externalities are costs (or benefits) borne by people other than the individuals who make water supply, water consumption and wastewater disposal decisions. Water has a higher value if the use of that water causes negative impacts on third parties and has a lower value if the use of that water causes positive impacts on third parties.

In addition, the degree of variability in inflows adds a premium to the value of water, because there is greater uncertainty about the availability of water in the following year.

The Water Corporation has calculated LRMC on the basis of two scenarios: one where inflows get progressively worse over the next 100 years, the other where inflows continue at the same average level as has occurred over the period 2001 to 2008.

> Two climate scenarios are considered for the determination of rainfall, or more particularly, annual inflows to dams.
>
> - The first scenario reflects the expectation for reduced rain inflows noted by CSIRO and the Australian Bureau of Meteorology in "Climate Change in Australia: Observed Changes and Projections" (October 2007). This publication outlines the range of predicted changes to rainfall in Australia, as a result of climate change. This publication notes that the most likely (50th percentile, median emissions) scenario in the southwest of Western Australia is for a 10% reduction in rainfall (from the 1990 baseline) by 2030 and a 20% reduction by 2050. Relatively small changes in rainfall result in considerably greater changes to stream flows. The Corporation's modelling translates this lower rainfall into 140 GL (gigalitres) of average annual inflows through to 2030, reducing to 100 GL by 2050…
> - The second climate scenario modelled is based on the actual inflows between 2001 and 2007 [of around 110 GL per year].
>
> (Water Corporation submission, p16-17)

The Authority considers the Corporation's model assumptions about dam inflows to be acceptable.

Availability and Cost of Groundwater

Abstraction of groundwater from Gnangara Mound currently accounts for approximately 56 per cent of metropolitan water supply. In 2008/09, abstraction from Gnangara Mound is expected to be 147 GL.

Currently, the Water Corporation and Department of Water have agreed to the Water Corporation abstracting water from the Gnangara Mound on the basis of an abstraction rule that is tied to the level of storage in the dams (see Box 1 overleaf).

When the Water Corporation applies this abstraction rule to the LRMC model, the average groundwater abstraction for the period 2009 to 2012 ranges from 126 GL to 142 GL, depending on the (dam) inflow assumption. Over the next 100 years, the average abstraction ranges from 111 GL to 118 GL per year.

The Department of Water provided the following advice to the Authority:[9]

> The Water Corporation has advised that allocations below 145 GL/yr during the 2008-12 period would significantly increase the risk of a total sprinkler ban. The DoW believes that the target of a 120 GL/yr average during this period will be difficult to achieve. Following the completion of the SSDP [Southern Seawater Desalination Plant], scheduled for 2012, the IWSS [Integrated Water Supply Scheme] groundwater allocation will be reviewed.
>
> The Gnangara Sustainability Strategy is likely to support the 120 GL/yr target for IWSS allocation and in addition will propose additional management measures such as reducing entitlements to other users and phasing out of pine plantations. Under a statutory water management plan, scheduled for 2011, the DoW aims to match longer term water use with

[9] Letter to Authority from Department of Water, 13 January 2009.

inflows, that is, allocations will be based on water that enters the system through recharge, or, more simply, water in equals water out.[10]

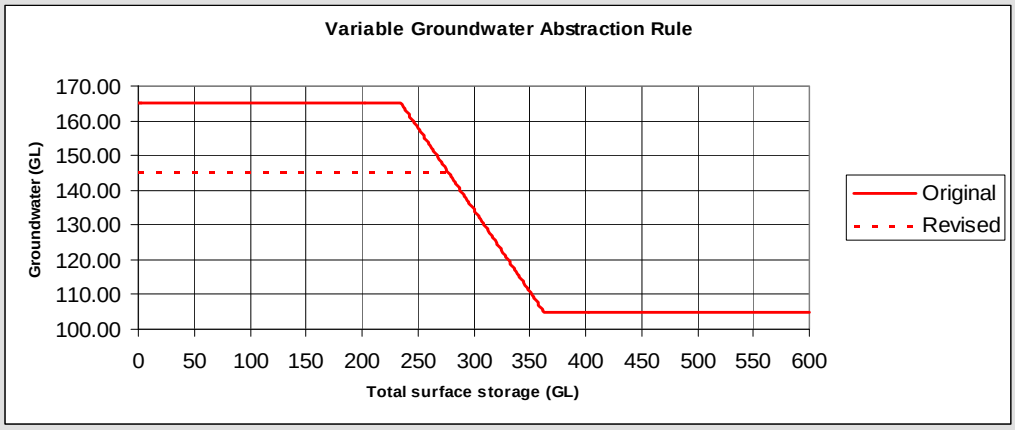
However, even if this aim is achieved, the ultimate equilibrium level of the mound is likely to be lower than its current level because of the current use volumes and because of the time lag involved before stabilisation would occur. Thus a target of 120 GL/yr of the Water Corporation is not necessarily a "sustainable" level of abstraction. Furthermore, the target would need to be revised as knowledge increases about how groundwater levels respond to reduced abstraction.

Until equilibrium is achieved, further damage to ecosystems and environmental amenity could be expected. Substantial immediate cuts to water would be required to significantly slow the current downward trend. It must be noted that it is very difficult to separate the direct impacts of climate variability versus abstraction.

Box 1. The Groundwater Abstraction Rule[11]

Groundwater accounts for approximately half the water requirements of the Integrated Water Supply Scheme (**IWSS**). Water is extracted via a series of bores, treated and fed into the IWSS. The vast majority of groundwater is abstracted from the Gnangara Mound, with smaller amounts taken from Jandakot and Neerabup.

A groundwater abstraction rule agreed between the Department of Water and Water Corporation guides annual groundwater abstractions. Abstractions are increased when dam (surface) storages are low and are reduced when dam storages are high. The original and revised abstraction rules (the revised abstraction rules were adopted in October 2008) are represented in the following figure.



As an example of how the abstraction rule operates, consider the following with regard to the original rule. If dam storages are less than 235 GL, groundwater abstractions of 165 GL are allowed. As dam storages increase, groundwater abstractions are reduced such that at dam storages of 300 GL, abstractions are approximately 135 GL. Once dam storages exceed 362.5 GL, abstractions fall to 105 GL.

The revised rule reduces the maximum volume allowed to be abstracted to 145 GL due to concerns the current level of abstractions are unsustainable. (Note that in the years up to 2012, the Water Corporation is permitted in exceptional circumstances to abstract 165 GL/year).

[10] The Department of Water, *Gnangara Groundwater Areas, Water Management Plan: for Public Comment,* February 2008. Public comment on the plan has now closed.

[11] Department of Water (February 2008), *Gnangara Groundwater Areas, Water Management Plan*, p50.

In the Draft Report, the Authority took the view that if additional sources were available to meet potable (drinking quality water) demand, the Department of Water would have reduced groundwater abstraction by users of the Gnangara Mound (including by the Water Corporation) over the period prior to the introduction of the Southern Seawater Desalination Plant. In particular, it is likely that the Department would have sought a change to the groundwater abstraction rule over this period to achieve a lower average groundwater abstraction than assumed in the LRMC calculation (129 to 140 GL per year).

The Authority considered that the Department of Water's view (that abstraction of 120 GL per year by the Water Corporation may be appropriate in the longer term but that there will be ongoing environmental consequences in the short term) indicates that a premium could be added to water usage charges in the short term to reflect this environmental externality.[12]

In its submission on the Draft Report, the Department of Water provided "in principle" support for an environmental externality premium, noting that such an approach would be consistent with the "precautionary principle".

The proposal to include an externality premium was rejected by the Department of Treasury and Finance. The Department of Treasury and Finance's main concern was that an externality premium could cause the highest value users of the Gnangara Mound (metropolitan customers) to reduce their demand and that the loss in customer well-being could more than offset the environmental benefit. The Department also indicated that it did not consider the environmental externality to be well-defined. If a premium were to be applied, the Department considered that it should apply to all users of the Mound, not just metropolitan customers. The Water Corporation also made this last point.

In response to the concern that it would be inappropriate to apply the externality premium just to potable users, the Authority considers that ideally a premium would be added to non-potable users as well; however, this matter is outside the scope of this inquiry (the Authority may consider this matter as part of the current Inquiry into Water Resource Management and Planning Charges). It should be noted that the premium that would apply to metropolitan customers would not result in higher payments for the average customer because the fixed charge would be reduced.

The Water Corporation did not object to the principle of including an externality premium. However, the Water Corporation submitted:

> A better approach than an externality premium, and one currently employed by the Department of Water, is to ensure only the sustainable abstraction is permitted (in which case, there is no externality premium)…
>
> A higher abstraction in the short term, with management of local impacts, can be offset with lower future abstraction (for example when the Southern Seawater Desalination Plant (SSDP) is commissioned). (Water Corporation submission on draft report, Part B, p3)

The Authority considers that the Department of Water is best placed to decide whether there is an environmental externality, at least in the short term, from the level of abstraction from the Gnangara Mound. The Authority therefore did not address the Water Corporation's view that any short term environmental impacts can be offset in the future.

In the Draft Report, the Authority calculated LRMC on the basis of a groundwater abstraction level (for the next ten years) that was lower than allowed under the abstraction

[12] Note that the externality charge would not result in any additional revenue to the Water Corporation, however, because the fixed water charge would be reduced to offset the higher usage charges.

rule. The Department of Water questioned whether using LRMC was the most appropriate approach to estimating an environmental externality premium, but supported this approach if a better method could not be found.

- The draft report does not address whether externality pricing is the most effective and efficient means practicably available to internalise any externality arising from groundwater abstraction.
- It is unclear if the draft report's proposal would substantially improve environmental outcomes or reduce risks of environmental damage. The report's recommendation for an externality premium does not appear to provide a significantly stronger demand-side price signal, and it only appears to impact upon a small number of high volume users. It may not significantly reduce the consumption of groundwater.
- The proposal does not appear to provide any supply-side price incentive in preference of non-groundwater sources or to increase investment in alternative sources.
- If groundwater abstraction externalities constitute a basis for a price premium, a more direct means of applying this premium could be upon the 'wholesale' abstraction of groundwater, rather than upon retail water use from all water sources. (Department of Water submission on Draft Report, p4)

The Water Corporation disagreed with the use of the LRMC model to calculate any environmental externality premium and submitted:

> the ERA should make a specific estimate of the environmental impact of additional residential consumption … and also whether an increase in price would have any beneficial impact. (Water Corporation, submission on draft report, Part B, p4)

The Authority has considered whether there are ways of taking into account the environmental externality associated with over-abstraction from the Gnangara Mound other than by adding a premium to water usage charges. There would not appear to be a viable way of reducing the current abstraction rate from the Mound. Trade between users of the Mound is currently provided for in the *Rights in Water and Irrigation Act* and the Water Corporation has presumably fully explored the options to trade with other users.

Given the absence of other options, the Authority considers that full cost-reflective pricing requires a premium for the environmental externality to be added to water usage charges. The Authority agrees that it is unclear whether a premium would substantially improve environmental outcomes. Nevertheless, given the uncertainty of inflows into the dams, and the possibility that a premium may reduce water usage, the Authority agrees with the Department of Water that adding a premium at this stage is prudent.

In the Water Corporation's LRMC model, the original abstraction rule is applied for the period leading up to the introduction of the second desalination plant and the revised abstraction rule is applied thereafter. The Authority has established that if the revised abstraction rule were also applied for the period leading up to the introduction of the desalination plant the resulting upper estimate of LRMC increases to $2.22 per kL (from $1.88 per kL). The higher estimate is largely due to the higher marginal cost of total sprinkler bans over the period prior to the introduction of the second desalination plant.

Using LRMC in this way to calculate the environmental externality is intuitively appealing, given the benefit to customers (from higher groundwater abstraction) over the next few years is a lower probability of a total sprinkler ban; and the ability of the LRMC model to quantify this customer benefit because it calculates the marginal cost of a total sprinkler ban.

Overall, the Authority considers that the cost of abstraction from the Gnangara Mound should incorporate the costs of the environmental externality, resulting from taking more water over the regulatory period than would ideally be taken if there were additional water sources. Making an adjustment to the LRMC model to reflect this externality results in a cost "premium" of up to $0.34 per kL (it will be shown in section 2.6.2 that an alternative means of calculating the environmental externality premium results in a slightly lower figure).

Size and Cost of Future Sources

The Water Corporation explained the assumptions it has made about development of future sources.

> [The Water Corporation's source development plan for pricing purposes assumes] a range of source options include water recycling (through groundwater replenishment), seawater desalination, development of the Wellington catchment, smaller localised groundwater sources and catchment thinning. The source development plan includes the completion of the Southern Seawater Desalination Plant by 2011. (Water Corporation submission, p17)
>
> It is essential that when undertaking source planning, a range of situations are considered – both optimistic and pessimistic…For pricing purposes however, the Corporation has based its calculation on a more moderate prediction of source development. While more dire circumstances may unfold, so may more favourable ones. The Corporation wishes to foreshadow a "more likely" view in its current prices. (Water Corporation submission, p15)

The Authority has accepted the Corporation's assumptions about future sources for the purpose of calculating LRMC.

Conclusion

In 2005, the Authority recommended that usage charges be set on the basis of two estimates of LRMC: a lower estimate of $0.82 per kL and an upper estimate of $1.20 per kL (in real dollar values of 2006), with the upper estimate applying above 550 kL per year. The assumptions for the lower estimate included that dam inflows would continue at the level experienced for the eight years preceding June 2006, additional water would be procured from the South West Yarragadee and further water trading opportunities would become available. The upper estimate assumed the same inflow assumption but was more conservative in terms of the availability of water from less expensive options.

Since 2005, a number of assumptions have been revised.

- The relatively less expensive option of transporting water from the South West Yarragadee option is no longer available as a source of water for the IWSS.
- The dam inflow assumption has been revised to the average inflows between 2001 and 2007 (110 GL per year) rather than the eight years preceding June 2006 (115 GL per year). In addition, another dam inflow assumption has been incorporated into the analysis: whereby dam inflows are progressively reduced over the next 100 years.

The Water Corporation's proposes (for the coming regulatory period) that estimates of LRMC ranging from $1.28 per kL to $1.70 per kL be used for the purpose of setting water usage charges in the metropolitan area.

The Authority considers that the Water Corporation's calculations are reasonable estimates for the expected value of LRMC at 2012/13. However, obtaining a current estimate of LRMC requires two modifications:

- the Authority considers that the assumption about groundwater abstraction should be based on a lower estimate of abstraction (in the short term) than that assumed by the Water Corporation in its LRMC modelling.
- the Authority considers that immediate variation in demand (rather than variation only once the second desalination plant is operational) is a more appropriate assumption and that it is valid to include the higher cost of restrictions in the current estimate of LRMC.

The Authority's calculation of the current value of LRMC results in a range from $1.24 per kL to $2.22 per kL.

2.6.2 Should Usage Charges Be Linked to an Estimate of the Short Term Value of Water?

In assessing the Water Corporation's proposal to have usage charges linked to the estimates of LRMC at 2012/13, the Authority has considered whether it would be more appropriate to link usage charges to a short term value of water.

The reasons given for setting water usage charges on the basis of a short term value of water include:

- greater scope for using price to defer large source developments if there is uncertainty about their utilisation;
- greater scope for capturing environmental externalities in prices; and
- the potential to use price rather than restrictions to address short-term water shortages.

The Productivity Commission recently concluded that one source of inefficiency in current approaches to urban water pricing is the failure of prices to signal the scarcity value of water.[13] The Commission noted that:

> Allowing water prices to reflect both costs and scarcity would provide more timely investment signals to suppliers. This would help avoid the 'feast or famine' approach to augmentation investments. It would also provide signals to private sector investors about water investment choices such as building a desalination plant, recycling water and investing in water saving technology.[14]

In addition, a recent recommendation contained in the National Water Commission assessment of the implementation of the National Water Initiative (recommendation 3.2.4) called for 'pricing regulation that encourages more flexible or market-driven pricing approaches to emerge in response to water scarcity'.[15]

[13] Productivity Commission (March 2008), *Towards Urban Water Reform: A Discussion Paper.*

[14] Ibid, page xxviii.

[15] National Water Commission (August 2007), *National Water Initiative – First Biennial Assessment of Progress in Implementation*.

Assessment

Many of the submissions commented on the usefulness of setting usage charges to reflect the short term value of water. The issues raised in submissions are summarised below.

- Water demand is insensitive to price and restrictions are a more reliable approach to dealing with short term supply shortfalls.
- Pricing water on a short-term basis would lead to fluctuations in the price, which would be unhelpful for consumers making long term water usage decisions.
- Increasing the price during shortages would have distributional impacts because some people may not be able to afford to continue their current water usage.
- Pricing on a short-term basis would be ineffective because of billing infrequency.
- Establishing a short-term (current) value of water requires more analysis.

Restrictions versus Higher Water Usage Charges

The Authority notes that when the LRMC theory was developed, it was not envisaged that sprinkler restrictions would become permanent. Rather, LRMC water pricing typically embodies a security buffer to provide sufficient excess capacity to meet unconstrained demand and to limit the chance of a total sprinkler ban (e.g. to a 1 in 50 year event).

A point raised against short-term pricing is that water users are relatively insensitive to price, so that the price would have to increase substantially to achieve the necessary savings in water usage. It is not clear how much the water usage charge would need to increase to ration demand. As such, restrictions are then viewed as a more reliable means of achieving water savings.

Following the introduction of the second desalination plant, it may be appropriate to develop another rule for demand management – whereby demand management initiatives (including prices) are gradually increased as the likelihood of having to commit to another significant source increases. Once the decision is made to commit to a new source, demand management measures could be reduced appropriately.

After due assessment, the Authority considers that the uncertainty over the responsiveness to price does not preclude the use of a short term pricing approach.

Fluctuations in Prices

On the issue of whether variations in water usage charges may lead to inefficient investment in long term water saving initiatives, the Authority notes that the lack of a long term price is not typically considered a concern in other markets, such as petrol. If the variation in water usage charges were an issue, the water service provider could indicate the LRMC to customers in their water bills. Alternatively, usage charges could be linked to the value of water calculated over a three-yearly rather than annual basis.

Any resulting change in the fixed charge (required to maintain the service provider's revenue requirement) would fluctuate inversely to the usage charge. At times when the value of water is low, users' bills would mainly consist of a fixed charge. This outcome would have implications for customers (e.g. tenants, who mainly pay for water usage, would see their bills vary significantly over time).

A possible option for addressing the concerns raised in submissions about the potential fluctuation in usage charges is to have the usage charge set as the greater of LRMC or the short term value of water.

Distributional Impacts

If price is used in preference to restrictions as a means of rationing demand, people who are not willing to pay for water, for example, because they cannot afford to continue to water their lawns and gardens, would lose those amenity values. If restrictions are used in preference to price, then all customers, including those who are willing to pay, suffer a loss in well-being.

The distributional benefit associated with restrictions comes at a cost. The use of demand restrictions rather than price results in a misallocation of resources: those who are prepared to pay the (higher) full cost of the water are prevented from using it, while those who are not prepared to pay the full cost of the water are able to use it without taking account of the full cost.

Conceptually at least, there are ways of achieving a more efficient allocation of water than by having water restrictions and which have a lower distributional impact than only using only price. For example, if equal water entitlements were allocated to each household, then water could be traded to those who value it most. In return, those who value the money over the water are compensated and are then able to spend their proceeds on other goods and services. However, those with a minimal need for the water entitlement, (e.g. because they don't have a garden) would receive a windfall gain.

Even though a household entitlement system is not in place, there is, nevertheless, compensation to households (but not to tenants) as a result of higher water usage charges. As water usage charges increase, the fixed charge decreases to maintain the revenue requirement.[16] This reduction in the fixed charge provides a disproportionate benefit to low water using customers (because the fixed charge is a larger component of the water bill for these customers than for high-use customers). Conversely, it is then low usage customers who bear the greatest cost impost from restrictions rather than high water users, because the fixed charge is higher than it would be if there were no restrictions and higher water usage charges.

Overall, the Authority considers that, on distributional grounds, there are reasons for using restrictions rather than price. However, the use of water restrictions – which prevent customers from using water, even though they are prepared to pay the full cost of using that water – is a policy that could be reassessed once the Southern Seawater Desalination Plant is operational.

Billing Frequency

Regarding the effectiveness of short-term pricing when there is infrequent billing, it is understood that the Water Corporation is considering increasing their meter reading to four readings per year, with bills to be sent out quarterly. The Authority supports this proposal and considers that it is likely to address the concerns raised during the inquiry.

[16] This is the result of a relatively inelastic demand curve, which involves the reduction in revenue from less water sales being more than offset by the increase in revenue from the higher price.

Establishing a Current Value of Water

A key issue raised during the course of the inquiry was the estimation of the short term value of water.

The value of water at any particular time is the result of water supply and demand. At present, the short term value of water in Perth is relatively high, as indicated by the existence of water restrictions. If there were to be a very wet winter, the short term value of water would decline. However, the extent that it would decline would depend on whether, even after the wet winter, there was sufficient water in the dams to significantly lower the probability of a total sprinkler ban. The value of water changes as new water sources come online. For example, as the Southern Seawater Desalination Plant comes online in 2012, the value of water would be expected to reduce.

The current value of water can be estimated by considering the extent that the price of water would need to increase to match the amount of water that is saved with current sprinkler restrictions (20 to 30 GL per year).

- There is some research evidence that a 10 per cent increase in the price of water would reduce demand by around 1 to 3 per cent[17]. As such, the demand for water is relatively unresponsive to the price. Indoor water use is particularly unresponsive to price.
- If it is conservatively assumed that a 10 per cent increase in the price of water reduces demand by 1 per cent, the water usage charge would need to increase from around $1 per kL at present to $2 per kL to achieve the water savings that are currently achieved by restrictions (assuming 30 GL needs to be saved).
- Using this same assumption, the water usage charge would need to increase to around $3 per kL to achieve the level of savings that would otherwise need to be achieved through a total sprinkler ban (assuming 60 GL needs to be saved).

The relationship between demand and price can therefore be approximated by making assumptions about the likely response to price increases. Despite the research evidence, the actual relationship is not well understood.

Given the uncertainty of dam inflows, consumers require water supply security and this security can be achieved by storing dam water to ensure that it is available in years of low inflows. This security represents an additional demand for water that would otherwise be consumed. The Water Corporation's LRMC modelling assumes the total sprinkler bans would only be tolerated as a 1 in 50 year event.

On the supply side, it is relatively certain what the sources of supply are going to be over the medium term: the major sources will comprise dam water, groundwater and the first and second desalination plants. Each of these sources has a short run marginal cost (i.e. the variable costs associated with producing another unit of water) which is also relatively well known. Dam water is relatively inexpensive (around $0.10 per kL) with groundwater slightly more expensive (around $0.20 per kL). The first desalination plant has a (short run marginal) cost of around $0.30 per kL, while the second desalination plant is likely to have a cost of around $0.50 per kL.

[17] Previous studies of residential consumption in cities both in Australia and overseas report a variety of elasticity estimates, ranging from -0.1 to -0.5, with the most common value being around -0.3 (NERA (2001), *A Review of Melbourne's Water Tariffs*, a report for the Department of Natural Resources and Environment.

The uncertain environmental impact of groundwater abstraction also needs to be reflected on the supply side. As discussed above, the abstraction of more than 120 GL per year over the next few years is likely to produce an environmental externality. In addition, the short run marginal cost of this additional groundwater is likely to be at least $2.00 per kL, because if it were not for the additional groundwater, the likely level of restrictions would be greater than 2 day per week restrictions.

Using these principles, the Authority's Draft Report developed a model to estimate the short term value of water over the regulatory period. The model was based on a hypothetical wholesale market for metropolitan water supply.[18] The model calculates the price at which supply equals demand for each of the next five years, given the available supply options, supply security requirements and an assumption about the responsiveness of demand to price. This model is described in detail in Appendix E.

The model was the subject of considerable debate following the release of the draft report (the responses are discussed in Appendix E). Overall, the submissions indicated that the model is potentially a valuable tool to help determine the future value of water and that the Authority should continue to develop the model.

The Authority agrees with the views of the Water Corporation and Department of Treasury and Finance that there should be a process for improving the model further, either prior to the final decision by government as part of the 2010 Budget or in time for the next review of the Water Corporation's tariffs. The Authority does consider, nevertheless, that the current model provides useful information (as one of many sources of information) to guide the setting of tariffs in this inquiry (particularly given the range of LRMC estimates). In particular, a short term model may be useful in identifying the environmental externality premium associated with abstraction from the Gnangara Mound.

If it is assumed that groundwater abstraction exceeds 120 GL over the period leading up to the second desalination plant, as in the Water Corporation's LRMC model, the short term model shows that the price of water is predicted to be:

- $2.28 per kL in the first year of the regulatory period (2010/11);
- $1.26 per kL in 2011/12; and
- $0.99 per kL in 2012/13.

A discounted weighted average of the price of water over the regulatory period is $1.48 per kL.

Alternatively, if it is assumed that groundwater abstraction is limited to a maximum of 120 GL in the period before the introduction of the second desalination plant, the value of water over the regulatory period is $1.72 per kL. This indicates an environmental externality premium (of abstracting more than 120 GL) of approximately $0.24 per kL (by comparison, estimating this value using the LRMC model indicated a value of $0.33 per kL).

While the short term model produces a discounted weighted average tariff of $1.72 per kL, there is a 50 per cent probability that the price of water will be $2 per kL or higher over the regulatory period.

[18] Note that it is the value of bulk water that is important. The cost of treatment and transportation to the customer are costs that are incorporated into the final value of scheme water to the customer, and are incorporated into the total water bill (including the fixed and usage charges).

The Water Corporation has proposed that the usage charge be set at $2.03 per kL for usage above 500 kL:

> The Corporation's preference for a three tiered tariff structure includes a price for the top taper that is based on the full cost of a desalination plant powered by renewable energy sources. This price signals to customers (as far as is practical) the full cost of their high consumption and is consistent with the user pays principle.
>
> The price is not a penalty charge, but rather one whereby some of the environmental impacts from the energy use and security of supply risks are effectively captured in the charge – to the extent that the Corporation actually incurs expenditure in mitigating these two externalities. (Water Corporation submission on issues paper, p41)

The Authority considers that linking the upper usage charge to the cost of the desalination plant is not appropriate because the cost of running the plant is likely to be significantly less than $2.00 per kL (the short run marginal cost of the Kwinana Seawater Desalination Plant is estimated at $0.31 per kL). If the next major source (after the Southern Seawater Desalination Plant) were to be another desalination plant, then the cost in present value dollars would be less than $2.00 per kL.

However, the Authority considers that the Water Corporation's proposal for an upper usage charge of $2 per kL is reasonable because it is possible that the short term value of water will be as high as $2 per kL over the next regulatory period.

Conclusion

Reflecting a short term value of water in usage charges does have certain advantages. It provides greater scope for using price to defer large source developments if there is uncertainty about their utilisation. It also provides the potential to use price rather than restrictions to deal with short-term water shortages, which in turn more effectively allocates the water to those who value it most.

However, because the second desalination plant has been committed, there is currently not a role for a short term price to defer a large source development. The Authority also considers that it would be inappropriate to replace restrictions with higher prices prior to the commissioning of the second desalination plant, given the uncertainty about the responsiveness of water demand to higher prices.

As with LRMC, there is uncertainty about the short term value of water and further work is required to improve the method of calculating the current value. The indications are, however, that the value of water in Perth over the regulatory period – with the environmental externality associated with groundwater abstraction included – is likely to be less than the current upper estimate of LRMC but similar to the expected value of LRMC at 2012/13. This finding supports the Water Corporation's proposal to set the second tier usage charge on the basis of the expected value of LRMC at 2012/13.

In future, the Authority considers that there is merit in continuing to advance the methods used to estimate the value of water to better guide the setting of prices.

2.6.3 Should Usage Charges Reflect the Cost of Water Delivery?

The preceding discussion provides guidance on how to determine a reasonable range of estimates of the value of water over a certain time-frame. Consideration then needs to be given to how to incorporate those estimates into water usage charges. Recent practice

has been to base water usage charges on the costs of bulk water (as represented by LRMC). However, other costs also vary depending on water usage, such as the costs of pumping water to a customer. It is generally considered efficient (and fair) that customers who cause costs to be incurred then pay for those costs. For this reason, the Authority considers that usage charges should reflect not only the value of water but also the variable costs associated with delivering the water to customers.

For the metropolitan area, the variable costs associated with delivering water to customers are largely the pumping and chemical costs of delivering dam water and groundwater. The Water Corporation estimates these costs to average $0.12 per kL.[19] (The Authority has estimated that the corresponding costs for Aqwest and Busselton Water are $0.09 per kL and $0.07 per kL, respectively.)

In considering this issue, the Authority has been guided by what would be expected to happen in a (hypothetical) water industry where the collection/storage, distribution and retail activities were undertaken by separate businesses. In that situation, it could be envisaged that a customer's bill would have separately itemised amounts for the cost of the bulk water service, the cost of distributing the water and the cost of retailing the water. The cost of bulk water would be based on the value of that water and recovered on the basis of the volume of water used; the cost of distributing water would be partly recovered through a usage charge and partly through a fixed charge; and the cost of retailing water would be recovered largely through a fixed charge.

2.6.4 Usage Charges for the Water Boards

Previous analysis undertaken by the Authority indicates that the LRMC of water in Bunbury is approximately $0.56 per kL (in real dollar values of 2006).

Aqwest raised concerns about applying LRMC pricing to the Water Boards. An issue with calculating the LRMC is that the relevant costs are those that are specific to the water service provider. The LRMC method does not explicitly take into account the opportunity value of water. In the case of the Water Boards, it is possible that the water available could be traded (at a higher price) for use elsewhere in the South West.

For example, Aqwest could trade its water to Water Corporation for use in servicing customers in areas adjacent to Bunbury. With the introduction of the Southern Seawater Desalination Plant, it is also conceivable that Aqwest could trade water to the Water Corporation for use in Perth (given that the capacity of the pipeline is being sized to take water from a 100 GL desalination plant).

Theoretically, the value of water in Bunbury would be the marginal cost of water at the export destination less any transportation costs. In an open market, trading opportunities would maintain price differentials at levels that reflect relative transportation and integration costs.

Therefore, LRMC is not always an appropriate method for determining the long term value of water and in the case of the Water Boards, the value of water would more appropriately be determined with reference to the value of water in the South West more generally.

Submissions by the Department of Treasury and Finance and Aqwest requested the Authority consider in more detail the merits of linking usage charges in Bunbury and

[19] The costs of pumping desalinated water have been excluded for the reason that these costs are required, for the next few years at least, to provide security and, as such, can be considered fixed costs, rather than variable costs (i.e. the costs are not caused by the decision by an individual customer to use water).

Busselton to the value of water in the South West. [20,21] Busselton Water submitted that its prices should be linked to nearby country towns, such as Dunsborough, rather than Perth.[22]

The difficulty with using the value of water minus transportation costs to determine usage charges is that the value of water has only been established for Perth and not other locations in the South West. It is understood from discussions with the Water Corporation that the likely cost of transporting water from Bunbury to Perth is approximately $0.50 per kL. Given the values of water in Perth that were established in the previous section, an upper estimate of the opportunity value of water in Bunbury is $1.65 per kL.

If a location nearby to Bunbury has an associated marginal cost that is higher than $1.65 per kL, then ideally that would be the main comparator. However, this information is not known by the Authority.

Busselton Water has a more limited external trading market than does Bunbury, given Bunbury's proximity to the Southern Seawater Desalination Plant. It is understood that a trade is being considered between Busselton Water and the Water Corporation to supply water to Dunsborough residents. However, the terms of that trade are not known.

2.6.5 Should Water Usage Charges be Adjusted to Achieve Social Objectives?

The broad range of estimates of the value of water indicate that there are a number of options for setting water usage charges without compromising the objective of economic efficiency. Guidance can be sought from social considerations, including:

- whether discounts (below efficient prices) should be provided for essential water usage;
- whether "water wasters" should pay a premium above the efficient price;
- the impacts on tenants, who tend to only pay the usage charge and therefore do not immediately benefit from any reduction in the fixed charges;
- the impacts on large households, who are more likely to have high water usage; and
- whether a transition from current usage charges to new usage charges is required.

Discounts for Essential Water Usage

As usage charges increase, one issue considered is whether there are reasons for maintaining a lower usage charge for, say, the first 150 kL of annual water usage, for all residential customers. Currently, Water Corporation customers pay $0.73 per kL for the first 150 kL per year, which under current policy is being transitioned to $0.96 (in real dollars of 2008) per kL by 2014. Currently, Aqwest customers pay $0.42 per kL and Busselton Water customers pay $0.47 per kL for the first 150 kL per year.

[20] Department of Treasury and Finance, submission on draft report, p8.

[21] Aqwest, submission on draft report, p7.

[22] Busselton Water Board, submission on draft report, p3.

Submissions

The Water Corporation recommends basing water usage charges for the first 150 kL of water usage on the lower bound of long run marginal cost, which it estimates at $1.28 per kL.

> Water usage charges should be based on the LRMC of new sources, with non-discretionary use based on the lower bound of the LRMC range.
>
> If this lower bound is still considered unreasonably high (such as in many country areas), then a discount is warranted because:
>
> 1) There are numerous, significant social benefits associated with a high quality, public water supply. A responsibility of a public utility is to ensure the community has access to affordable water necessary for maintaining a reasonable lifestyle;
> 2) For reasons of revenue sufficiency, it is possible that if water is priced at the upper range of the LRMC, then a discount for the non-discretionary usage is required to ensure the Corporation does not over recover the cost of providing the service.
>
> (Water Corporation submission on issues paper, p40)

The Water Corporation did not indicate that it considered $1.28 per kL to be unreasonably high and did not propose a discount.

In relation to the level of the threshold, the Water Corporation has indicated:

> The Corporation had previously proposed a tariff structure with a first tariff threshold of 0 to 300kL. The ERA has proposed a threshold of 0 to 150kL. The Corporation is willing to support the 0 to 150kL threshold as proposed by the ERA, acknowledging that while it will result in a higher usage charge between 150kL and 300kL, the higher price will:
>
> - encourage more efficient water consumption;
> - not result in more revenue for the Corporation as the additional revenue from increases in volume charges will be offset by reductions to the water service charge. Consumers using small volumes will therefore pay less under the proposed tariff structure, while large consumers will pay more.
>
> However, there is a valid counter-argument that since average metropolitan residential consumption is approximately 280kL, a step at 300kL has the potential to signal to the consumer that they are going beyond a normal level of consumption. There is no such signal if the second step is 150kL to 500kL. (Water Corporation submission on draft report, Part B, p12)

Aqwest submits that additional discounts are not needed.

> Aqwest's current charge per kL for the first 150 kL of annual consumption is 42 cents. This is extraordinarily cheap and additional discounts are not required. (Aqwest submission on issues paper, p6)

WACOSS supports customer discounts for low water usage.

> WACOSS generally supports the approach that there should be a tariff block, within any pricing regime, that should accommodate non-discretionary water usage at an affordable rate. (WACOSS submission on issues paper, p10)

The Department and Treasury and Finance supports setting water prices on the basis of efficiency principles and using other State Government mechanisms to achieve distributional objectives.

> A suggested proposal…is the separation of full cost recovery of customer service charges from any welfare or social policy considerations that may be deemed necessary by the Government. It is not considered appropriate for social policy to be delivered through discounted water charges as such a broad approach will benefit even those without a proven need for such assistance. It is considered more appropriate for social policy to be delivered by more targeted means. (Department of Treasury and Finance submission on issues paper, p1)
>
> Subsidised pricing of non-discretionary water usage provides inefficient incentives for other water saving measures around the home and leads to an overall welfare loss to the community.
>
> Full cost recovery for all water usage provides households and businesses alike with the right incentives to either manage or conserve their water usage (through voluntary conservation or the use of water efficient technology) or to elect to use as much water as the individual chooses to.
>
> Even at a high end LRMC estimate of $2.00 per kL, average discretionary use of 150kL per annum equates to less than $6 per week and is therefore not considered to be cost prohibitive. That said, if there are members of the community facing difficulties in meeting the cost of such basic services, such matters should be addressed with targeted social policies, rather than distorting the entire pricing structure.
>
> (Department of Treasury and Finance submission on issues paper, p11)

Assessment

The first reason for applying discounts is that pricing water at its value might lead to an over-recovery of revenue and an adjustment to either the fixed or usage charges (applying to non-discretionary usage) would be considered appropriate, thereby ensuring the water utility does not over-recover revenue. Whether or not such an adjustment is needed is an empirical issue, which depends on each water utility's cost projections and marginal cost estimates. The second reason for providing a discount is to achieve social objectives associated with maintaining water for essential needs at an affordable level.

A complication with discounting the usage charge is that the discount goes not only to low volume customers but also to all customers using more than the threshold amount (in a similar way that income tax relief to low income taxpayers also benefits high income taxpayers). The reduction in revenue from applying the discount can therefore be large and this revenue "shortfall" needs to be balanced. If the revenue shortfall is made up by increasing the fixed charge, the total combined impact of the discount and the increase in the fixed charge may be that water bills for low water using customers do not change significantly. Indeed, the impact can be that very low water using customers can be worse off with the discount than without it.

For example, if the metropolitan water usage charges in 2009/10 had been set at a flat rate of $0.84 per kL, the fixed charge would have remained at its current level of $196. Applying a discount of 50 per cent to water usage up to 150 kL per year (i.e. applying a charge of $0.42 per kL) would have increased the annual fixed charge by $37 (from $196 to $233) in order to maintain the Water Corporation's revenue requirement from metropolitan water customers in that year. Customers using less than 89 kL per year would be in a worse financial position from having the discount on water usage. Customers using between 89 kL and 150 kL per year would benefit by up to $26. All residential customers using 150 kL per year or more would benefit by $26.

Another option is to fund the discount by a Community Service Obligation (CSO) payment, as this would not impact on the fixed charge. However, it would not be possible to target

the benefit of the CSO payment as the discount would be received by all customers. The Authority has calculated that, for the example provided in the previous paragraph, the 50 per cent discount would require a CSO payment of approximately $25 million in 2009/10.

A further option is to fund the discount by increasing the usage charge to high water using customers. In effect, this approach would recoup the benefit that high water users receive from any discount that is provided for low volume usage. As a consequence, the fixed charge would be lower than otherwise. However, only 7 per cent of total water sales in the metropolitan area are above 500 kL/year. To entirely fund the 50 per cent discount (as in the previous example) to low water using customers, the charge for usage above 500 kL/year would have had to increase by more than 500 per cent (that is, the usage charge would need to increase from $0.84 per kL to $4.58 per kL to maintain the annual fixed charge at $196). Such a high usage charge would significantly exceed the value of water and be inefficient.

A further consideration is that the composition of households using less than 150 kL per year is likely to disproportionately include garden bore users, who generally limit scheme water use to indoor activities. Currently, around 25 per cent of households have a garden bore in Perth.

Overall, the Authority considers that there is not a case for applying a discount for low water usage if the purpose is to lower the price of water for essential needs because there is a risk that a discount increases water payments (fixed charge plus usage charge) for very low water usage customers, rather than reducing it. However, a discount may be appropriate if the amount of revenue recovered from discretionary usage is more than the cost of providing the service.

A related consideration is whether it is appropriate to apply the lower estimate of the value of water as the usage charge for, say, the first 150 kL of water usage. This has been proposed by the Water Corporation (its recommendation is to charge the first 150 kL at $1.28 per kL, which is its lower estimate of LRMC). The Authority considers this approach has merit in situations where the costs of providing the water service are increasing significantly, as they are for the Water Corporation's metropolitan water operations. Providing a lower usage charge for the first 150 kL can in this circumstance moderate the impacts of any payment increases on low to medium water users (even though it could result in very low water users paying slightly more). This issue will be explored in more detail in the next section.

In conclusion, to reduce water charges for essential needs (e.g. for water usage less than 100 kL of water per year), it is preferable to lower the fixed charge rather than the usage charge, as a lower fixed charge more effectively targets the reduction to very low water using customers. However, when costs are increasing significantly, setting the usage charge at the lower estimate of the value of water can moderate the payment increases for low to medium water users (e.g. those between 100 and 300 kL per year).

Penalties for High Water Usage

Following the 2005 Inquiry, the Government decided, for usage above 950 kL per year, to retain a tariff at a level that was almost twice as high as the (then) estimate of LRMC. The Government indicated that households using very large amounts of water should pay a penalty rate. The issue discussed in this section is whether charges above the value of water are appropriate.

Submissions

Submissions by Aqwest and D. Wettenhall support penalty charges for high volume users:

> Yes [high volume users should pay a penalty charge] – the higher the consumption the higher the charge. (Aqwest submission on issues paper, p6)
>
> To maximise the incentive to conserve water the fixed charges should be minimized and the unit consumption charges increase as consumption increases. Large users should be paying higher (penalty) rates, not receiving discounts for economies of scale. (D. Wettenhall submission on issues paper, p2)

WACOSS supports penalty rates for very high water users but recommends that safeguards be put in place to ensure that households with large non-discretionary water needs, such as large households, were not disproportionately affected.

> WACOSS supports the idea of very high volume water users paying a penalty rate. Excessive water consumption increases the total amount of water consumed, placing upward pressure on infrastructure investment for treatment and carriage, resulting ultimately in increased water tariffs for all consumers. While price signals exist as a blunt demand management mechanism, it is fair to say that low volume consumers place less upward pressure on water prices that higher-volume consumers...
>
> With this in mind it is important, however, to recognise that households should not be penalised if there is a legitimate reason for excessive water use. There needs to be a mechanism for which high occupancy households are not penalised, so as to ensure equity. There should also be exemptions for people with special health conditions...
>
> WACOSS agrees with the ERA's concerns that penalty rates for very high volume users may not achieve efficiency objectives and suggests that in addition to paying a penalty rate, excessive water users may be subject to other measures, such as outdoor water restrictions. This may prove to be a more effective demand management strategy for those users who have a high income and are not adversely affected by paying a penalty rate.
>
> (WACOSS submission on issues paper, p12-13)

WACOSS's concerns regarding the impact of high usage charges on large households are reiterated by the Department of Water:

> In addition to the issues raised by the Economic Regulation Authority, the National Water Commission paper Approaches to Urban Water Pricing argues that such charges may be inequitable because they can disadvantage large, low income households. (Department of Water submission on issues paper, p7)

Assessment

There is a view, embodied in the current pricing structure, that "water wasters" should pay a penalty charge. This view appears to be the result of a general community perception that water is scarce and that penalty charges will discourage wasteful practices. If water is not used with care, it is argued, there will not be enough water for those who really need it. A similar line of argument is that water wasters are imposing costs on others by causing investments in water sources that may not be needed if the water wasters had taken greater care with their water usage.

There is potential merit in recovering a disproportionate share of joint costs from those customers who have a lower sensitivity to the price of water and using the additional revenue, for example, to provide a discount to low water using customers. There may not

be any resulting loss of efficiency (that is, if neither high nor low water using customers changed their consumption decisions as a result). However, there would need to be a very high penalty charge to generate sufficient revenue to provide a meaningful reduction in charges to low water using customers.[23]

A complication with a penalty charge is deciding on the level of water usage above which the penalty should apply. As noted by WACOSS the penalty charge can have the unintended consequences of increasing bills to large families. It is difficult to distinguish, through penalty pricing, between high water use that is purely wasteful (e.g. sprinklers that water the street rather than the garden) and high water use that is required to meet reasonable need (such as in high occupancy households).

It is the case that a greater contribution to joint costs can be achieved by applying a penalty charge. However, the amount of revenue gained would be relatively low because of the relatively small number of very high water users. Overall, the Authority does not support penalty charges because it is unlikely to be efficient and the justification on equity grounds is unclear.

Tenants

For a given level of costs, an increase in the water usage charge reduces the fixed charge. The reduction in the fixed charge does not benefit tenants who typically pay only the usage charge (the fixed charge is generally paid for by the landlord).

Submissions

WACOSS expressed concern regarding the social impacts of any price increases, particularly in the case of tenants:

> Tenants should not be disadvantaged....Mechanisms should be set in place to ensure that this group is not disproportionately affected by increases to usage charges. Tenants should not be used to, in effect, subsidise the water costs of property owners. (WACOSS submission on Issues Paper, p8)
>
> According to the 2003/04 Australian Bureau of Statistics (ABS) 24.62% of people reside in residential tenancies in Western Australia….
>
> There are a variety of different arrangements existing within residential tenancy agreements, whereby the tenant is deemed responsible for all, or a part of the volumetric water consumption to the property. In nearly 75% of the cases, tenants are responsible for 100% of the volumetric water charges….
>
> Tenants are most likely to consume in the lowest tiers and as such place the least pressure on the cost of water infrastructure. Therefore they should not be facing the largest increase in costs of all consumers. WACOSS argues that the tier structures need to be adjusted to take into consideration the issues raised in this submission in relation to tenants. (WACOSS submission on Draft Report, p8)

The Department of Water notes that reducing discounts for low water usage could penalise tenants.

[23] For example, compared to a flat usage charge of $0.84 per kL in 2009/10, a 50 per cent increase in the usage charge for high volume customers (with usage above 500 kL per year) provides a benefit to low volume customers of $4.20. The benefit to low volume customers is the result of the reduction in the fixed charge that is required to maintain the same revenue requirement.

> A reduction in the discounts for low water usage could improve efficiency, particularly if it sent improved price signals to small households with minimal potential for outdoor water use. However, it has the potential to penalise tenants who would not receive any corresponding reduction in fixed charges. The Department of Water would be interested in the Economic Regulation Authority's views on potential means of addressing this disparity. (Department of Water submission, p7)

Assessment

One of the reasons for the eight year transition to LRMC was the disproportionate impact on tenants of the move to high water usage charges. The Authority accepts that the impact on tenants is a concern and considers that, where all else is equal, the preferred options for setting water usage charges should minimise the impacts on tenants. That is, options that minimise any reduction in the fixed charge would be preferred to options that result in a significant reduction in the fixed charge.

Large Households

Households with a large number of occupants are more likely to have higher water usage and would be more adversely impacted by inclining block tariffs than households with fewer occupants (all else being equal).

Submissions

> Inclining tariff structures have the capacity to disproportionately impact on larger families and high-occupancy households where there is a limited capacity to further reduce water consumption. WACOSS asserts that tariff structures should not disproportionately impact on larger households. Government subsidies, concessions and other methods should be used to bring the impact of water pricing on this group in line with other sections of the community. (WACOSS submission on Issues Paper, p11)

> WACOSS has referred to the most recent Domestic Water Use Study which was conducted during 1998-2001 and published in 2003. Using the figures in this study, an individual person would be expected to use approximately 56.57 kL per year; therefore a large household with 6 occupants (including 150kL per year for outdoor water usage) would be expected to use approximately 489.42kL per year. Therefore a family larger than 6 occupants, which is not uncommon, would easily use in excess of 500kL per year and would be subject to costs significantly higher than other customers.
>
> Therefore it may be appropriate that the threshold of the second tier be increased to 550kL per year, to accommodate larger families. WACOSS also suggests that residential households of more than 6 occupants with annual usage higher than 550kL be entitled to apply for water consumption rebates. These rebates should be dependant on the number of people residing in the property, and could be accessed via a centralised rebates and concessions unit as discussed later in this submission. (WACOSS submission on Draft Report, p9)

Assessment

On the basis of data from the Domestic Water Use Study, as indicated by WACOSS, a household with six occupants and a garden could be expected to use up to 500 kL per year. This was the basis of the proposal by the Water Corporation to have the upper usage charge apply to water usage above 500 kL per year.

Approximately 14 per cent of customers currently have water usage above 500 kL per year and 10 per cent have water usage above 550 kL per year. A customer using 550 kL per year would pay an additional $16 per year (an additional $0.03 per kL) if the threshold were 550 kL rather than 500 kL.

The Authority does not have any information about customers that use more than 500 kL per year. It is unknown to what extent they are large families, or smaller families using large amounts of water on their garden. Given this uncertainty, the Authority does not have sufficient reason to not support the Water Corporation's proposal to set the upper threshold at 500 kL per year.

Whether the Government wishes to provide a rebate to large households, as proposed by WACOSS, is not a matter that the Authority can comment on as part of this inquiry.

Transition Issues

As discussed above, a transition to higher usage charges will not benefit tenants because they do not generally benefit from any compensating reduction (or lesser increase) in the fixed charge.

A transition to higher usage charges generally benefits high volume customers and penalises low volume customers. This is because high volume customers, who have the usage charge making up the greater part of their bill, benefit from the delay in having to pay higher usage charges; while low volume customers, who have the fixed charge making up the greater part of their bill, are penalised by the delay in the reduction in the fixed charge.

For the current situation, if usage charges were to be immediately transitioned to charges that reflect the value of water, and the fixed charge was immediately reduced to compensate for the revenue generated by the higher usage charges, then low volume customers (e.g. those using less than 200 kL per year, but not tenants) would face reductions in their bills while high volume customers would face significant increases.

If the situation were reversed and the rebalancing involved a reduction in usage charges and an increase in the fixed charge, the results would be reversed with low water usage customers benefiting from a transition and high water usage customers being penalised for a transition.

Overall, the Authority considers that, in the current situation, an immediate adjustment to higher water usage charges and a reduction in the fixed charge would benefit low water usage customers (although not tenants) and is more efficient because it results in customers immediately paying a usage charge that reflects the value of water. (Transitional issues are considered further in the conclusion.)

Summary

The social issues considered in this section indicate that the following principles can provide guidance to the setting of usage charges:

- To reduce water charges for essential needs (e.g. for water usage less than 100 kL of water per year), it is preferable to lower the fixed charge rather than the usage charge, as a lower fixed charge more effectively targets the reduction to very low water usage customers. However, when costs are increasing significantly, setting the usage charge at the lower estimate of the value of water can moderate the payment increases for low to medium water users (e.g. those using between 100 and 300 kL per year).
- A penalty charge on high usage customers is unlikely to have a significant impact on the water bills of others and is unlikely to be efficient. The highest water usage charge should be no higher than the upper estimate of the value of water.

- To minimise the impact on tenants, options that limit the reduction in the fixed charge are preferred to options that result in a significant reduction in the fixed charge (assuming there is little difference between the options in terms of economic efficiency).
- To minimise any impact on large households, any threshold for higher water usage charges should be set at 500 kL per year or above.
- If usage charges need to increase to reflect the value of water, any delay in transitioning to higher usage charges penalises low water using customers (except tenants) and benefits high water using customers (the reverse applies if usage charges need to decrease to reflect the value of water).

2.6.6 Conclusion

The Authority's conclusions for water charges for households in Perth, Bunbury and Busselton are presented in this section.

Water Corporation's Perth Customers

Residential Customers

In the preceding discussion the Authority concluded that current estimates of efficient water usage charges for Perth would range from $1.34 per kL to $2.31 per kL. In addition, the Authority established a set of guiding principles to reflect social considerations.

In considering the usage charge that should apply to the majority of customers, the Authority has also taken into account the following factors:

- Given the uncertainty of dam inflows, there is less risk associated with over-pricing water rather than under-pricing water, which means that more weight should be placed on upper estimates of the value of water.
- The majority of customers should face a usage charge that includes the environmental externality premium. The estimate of $1.70 calculated above is consistent with the upper estimate of the average short term value of water over the regulatory period, inclusive of an environmental externality premium.
- It is likely that there will need to be a transition to the new usage charges because most metropolitan residential and commercial customers currently face a usage charge of less than $1 per kL (the need for a transition is discussed further below).
- Given the need for a transition, it should be recognised that the value of water is likely to be declining over the regulatory period. It would be inappropriate to transition the majority of customers to a usage charge that is significantly higher than the estimate of LRMC in 2013.

In applying the conclusions presented above, the Authority considers that an appropriate balance would be to have:

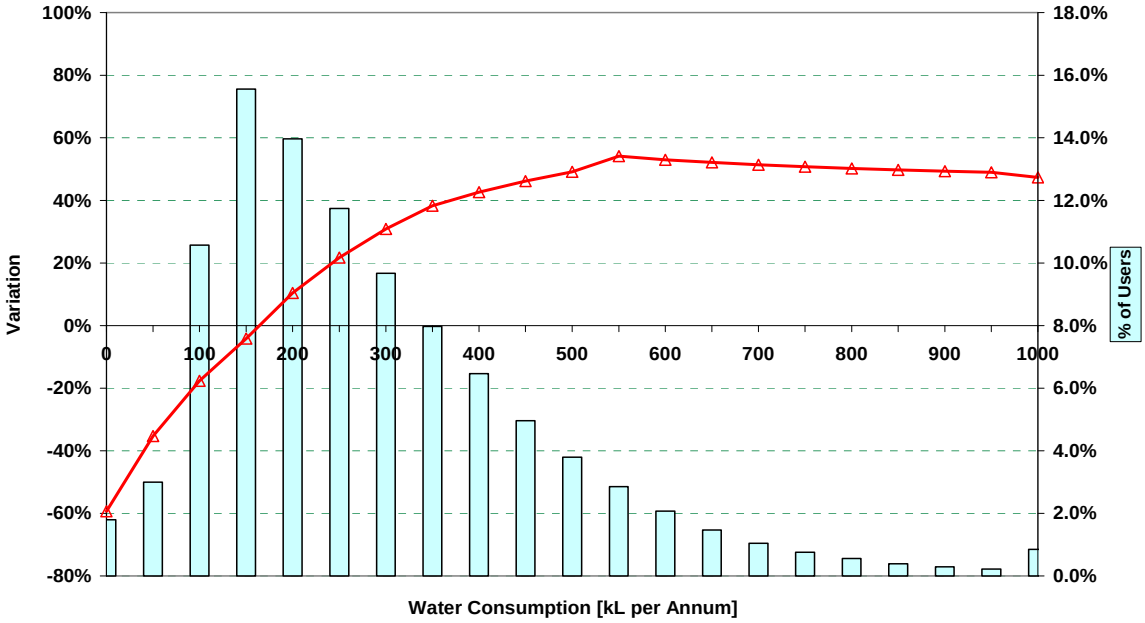
- the lower estimate of LRMC calculated for 2013 plus the marginal cost of distribution ($1.40 per kL) apply to water usage up to 150 kL per year;
- the upper estimate of LRMC calculated for 2013 plus the marginal cost of distribution ($1.83 per kL) apply to water usage between 150 kL and 500 kL per year; and

- for usage above 500 kL, the price that is likely to achieve the amount of water savings from two day per week sprinkler restrictions and recover the marginal cost of distribution ($2.15 per kL).

The Authority considers that these usage charges should be transitioned by 2012/13. The annual fixed charge should decrease from $195.74 in 2009/10 to $79.59 in 2012/13.

The financial impacts of this scenario are presented in the following three figures. Figure 2.1 shows the percentage increase in water payments from 2008/09 to 2012/13 by annual water usage. This figure shows that the financial impacts generally increase with water usage.

Figure 2.1 Preferred Option for Water Corporation's Perth Households: Percentage Increase in Water Payment from 2009/10 to 2012/13 by Water Usage



The distribution of costs across users with different levels of water usage is shown in Figure 2.2. With the exception of very low water users, most water users would make similar water payments (i.e. including both the fixed charge and usage charge) on a per kL basis.

Figure 2.2 Preferred Option for Water Corporation's Perth Households: Average Cost per kL by Water Usage (as at 2012/13, Real Dollars of June 2008)

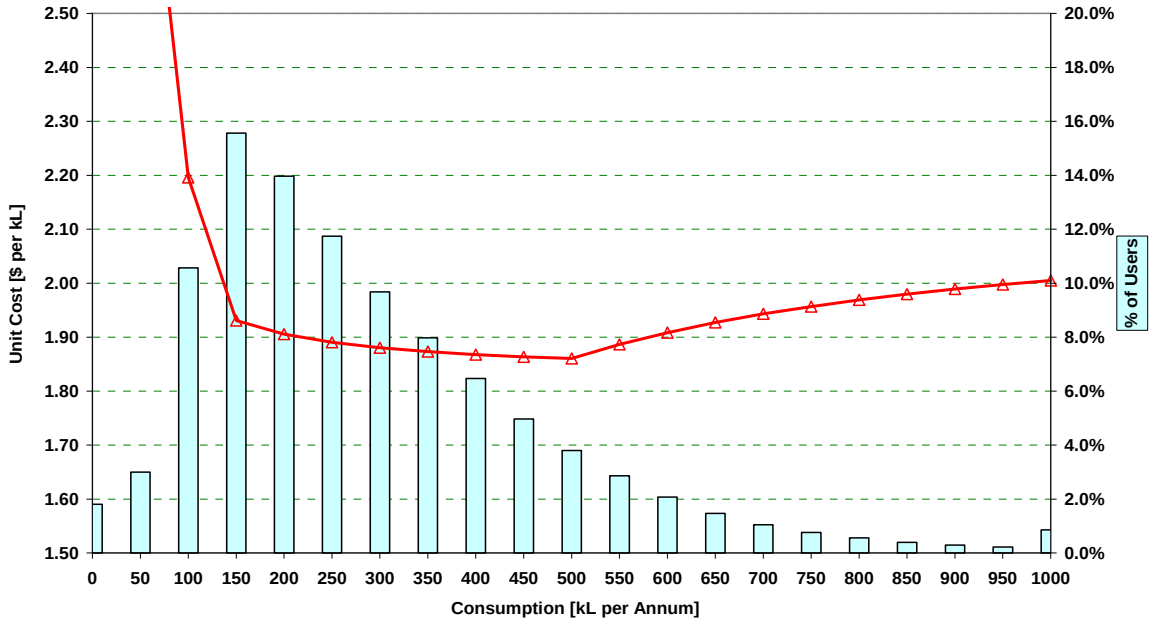
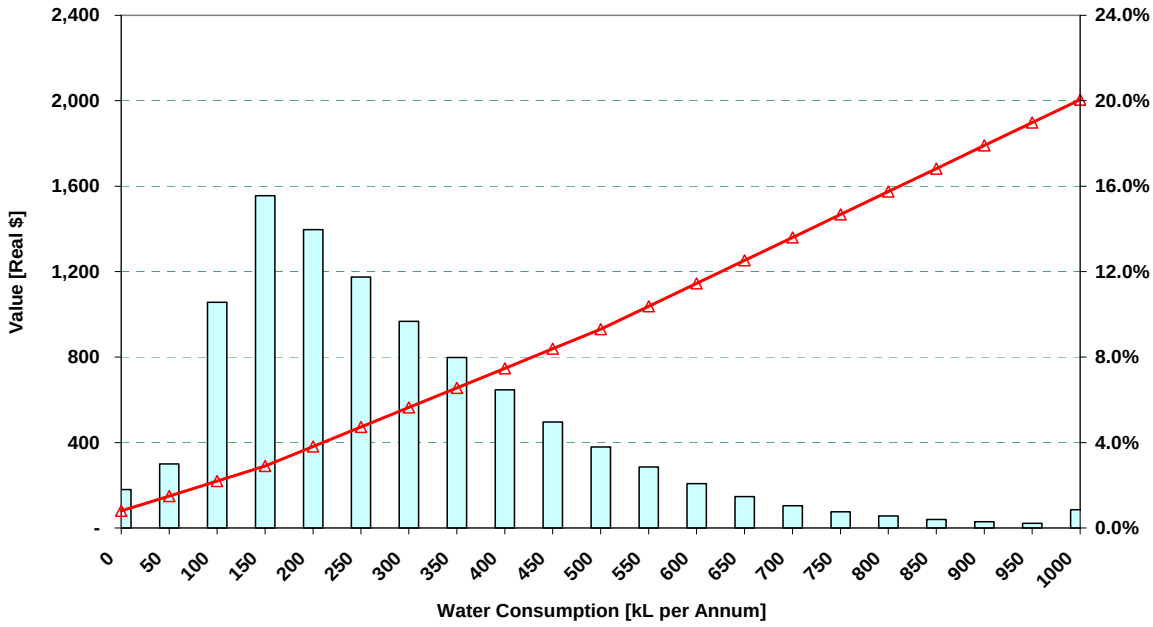


Figure 2.3 shows the relationship between the total water bill (including both usage charges and the annual fixed charge) and water usage for 2012/13.

Figure 2.3 Preferred Option for Water Corporation's Perth Households: Metro Water Total Payment (as at 2012/13, Real Dollars of June 2008)



By comparison, the following three figures show the impact of other options considered by the Authority, including the Water Corporation's proposals. "Prefer" in the figures is the Authority's preferred option.

- The Water Corporation's proposed option is shown as "Water Corporation" in the figures. This option is considered to have less favourable impacts because it results in higher payment increases for lower volume customers and lower payment increases for higher volume customers.
- The "Alternate" option is the same as the Authority's preferred option except that it links the upper usage charge to the current upper estimate of LRMC (plus the marginal cost of distribution). It results in marginally higher payment increases for large water users and only a slightly lower annual fixed charge. The Authority favours its preferred option because the current upper estimate of LRMC is likely to be higher than the upper estimate of LRMC in 2012/13, and therefore there may not be an ongoing justification for applying the high usage charge associated with the "Alternate" option.

  Another option (shown as "Flat" in the figure) has a flat usage of $1.83 per kL, with the fixed charge calculated as the residual amount required to recover the Water Corporation's water service costs for metropolitan residential customers. In comparison to the Authority's preferred option, this results in higher payments for the majority of customers, and lower payments for very high water using customers. In addition, tenants using less than 150 kL would be worse off under a flat charge.

Figure 2.4 Tariff Options for Water Corporation's Perth Households: Percentage Increase in Water Payment from 2009/10 to 2012/13 by Water Usage (Real Dollars of June 2009)

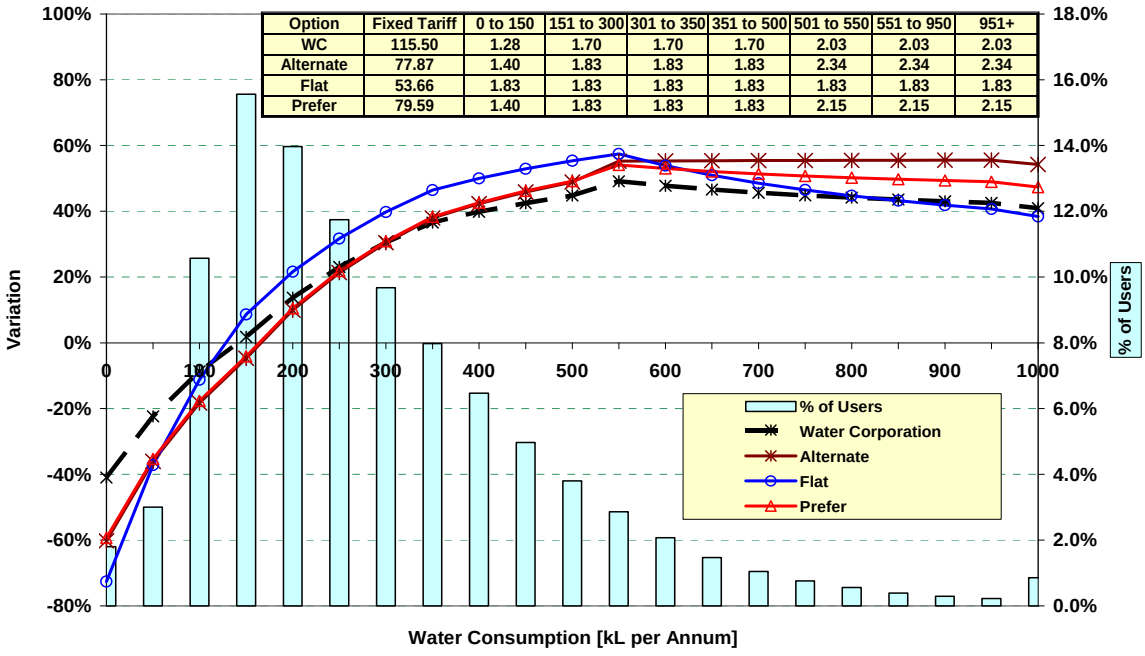


Figure 2.5 Tariff Options for Water Corporation's Perth Households: Average Cost per kL by Water Usage (as at 2012/13, Real Dollars of June 2009)

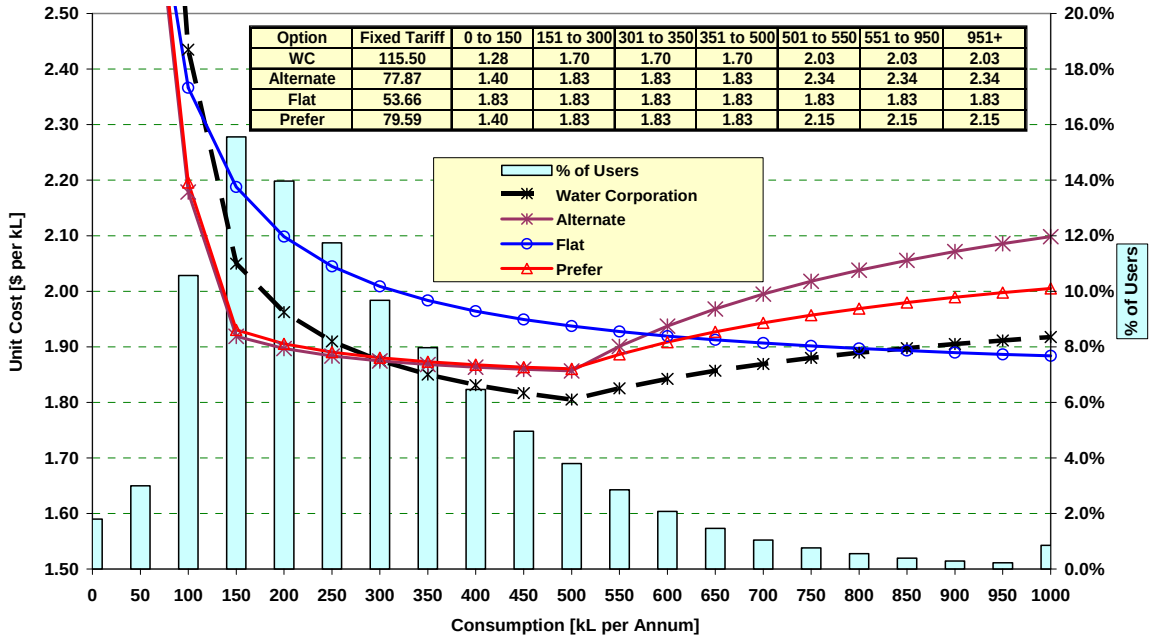
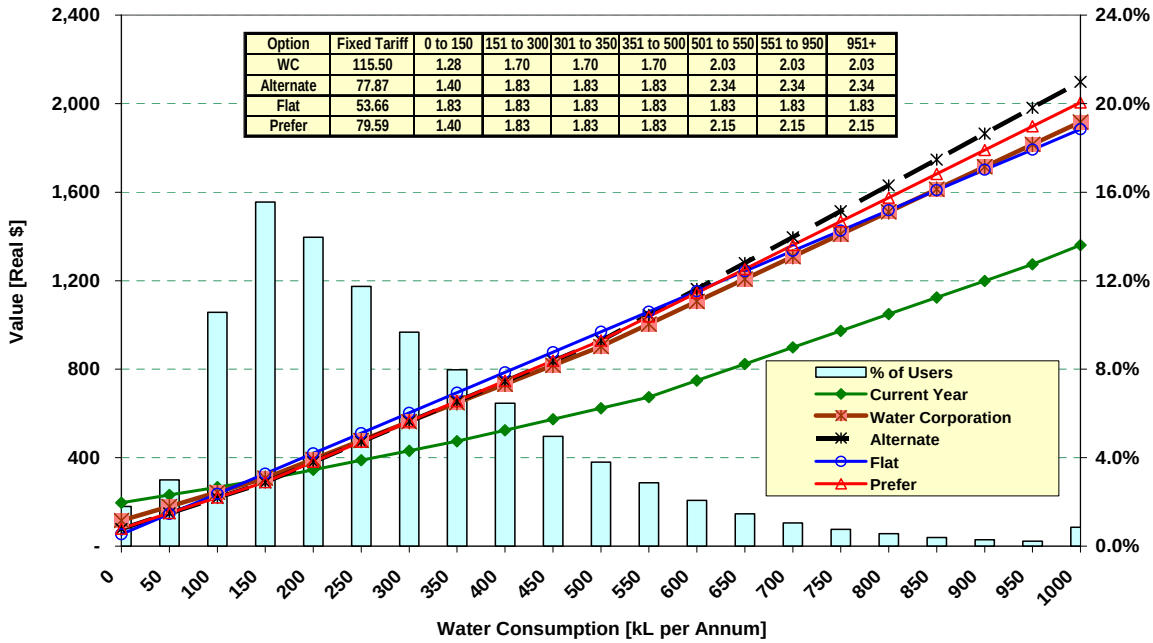


Figure 2.6 Tariff Options for Water Corporation's Perth households: Metro Water Total Payment (as at 2012/13, Real Dollars of June 2009)



Impacts of alternative transition paths

As discussed earlier a transition to higher usage charges benefits tenants but has a negative impact on low volume customers who are not tenants. A transition period would also delay the introduction of efficient water prices. This section presents the impacts of the options in transitioning to the Authority's recommended tariffs in one year versus three years. In each table the dollar impact is in terms of the impact (increase or decrease) on total charges (usage and fixed) in each year.

Table 2.4 shows the impact on residential customers in the metropolitan area if the usage charges in 2010/11 were set at the efficient level and the annual fixed charge were reduced to $50.

Table 2.4 Impact of Immediate Transition to Higher Usage Charges on Residential Metropolitan Customers (not tenants), Fixed Charge Set At $50 in 2010/11, Real Dollar Values of June 2009 – Change in Total Charges

	2011	2012	2013
100kL/annum	-77	24	24
200kL/annum	6	24	24
300kL/annum	103	24	24
400kL/annum	194	24	24
500kL/annum	277	24	24
600kL/annum	367	24	24
700kL/annum	432	24	24

Table 2.5 shows the impact on residential tenants in the metropolitan area if the usage charges in 2010/11 were set at the efficient level. There are significant impacts on tenants, who are likely to comprise approximately 25 per cent of residential customers. For example, tenants using 200 kL per year would pay an additional $152 in 2011 but then not pay any further increases in the following years.

Table 2.5 Impact of Immediate Transition to Higher Usage Charges on Residential Metropolitan Tenants, Fixed Charge Set At $50 in 2010/11, Real Dollar Values of June 2009 – Change in Total Charges

	2011	2012	2013
100kL/annum	69	0	0
200kL/annum	152	0	0
300kL/annum	249	0	0
400kL/annum	340	0	0
500kL/annum	424	0	0
600kL/annum	514	0	0
700kL/annum	579	0	0

The impacts on residential customers and tenants if there was a transition to the higher usage charges over three years (to 2012/13) are shown in Table 2.6 and Table 2.7.

- Customers using 100 kL would see a $16 reduction in each of the next three years, rather than a $77 reduction in the first year (comparative to a one year transition) and a $24 increase in each of the following two years.
- Customers using 500 kL would see a $102 increase in each of the next three years, rather than a $274 increase in the first year and a $24 increase in each of the following two years.

  Tenants using 200 kL would see a $12 increase in each of the next three years rather than a $6 increase in the first year and a $24 increase in each of the following two years.

Table 2.6 Impact of 3 Year Transition to Higher Usage Charges on Residential Metropolitan Customers (not tenants), Fixed Charge Reduced to $79.59 in 2012/13, Real Dollar Values of June 2009 – Change in Total Charges

	2011	2012	2013
100kL/annum	-16	-16	-16
200kL/annum	12	12	12
300kL/annum	44	44	44
400kL/annum	74	74	74
500kL/annum	102	102	102
600kL/annum	132	132	132
700kL/annum	154	154	154

Table 2.7 Impact of 3 Year Transition to Higher Usage Charges on Residential Metropolitan Tenants, Real Dollar Values of June 2009 – Increase or Decrease in Total Charges

	2011	2012	2013
100kL/annum	23	23	23
200kL/annum	51	51	51
300kL/annum	83	83	83
400kL/annum	113	113	113
500kL/annum	141	141	141
600kL/annum	171	171	171
700kL/annum	193	193	193

Overall, the Authority prefers the option of transitioning the higher usage charges over a period of three years. The benefits to tenants from transitioning are significant. Household with large families are also likely to benefit from the three year transition. Low volume customers (who are not tenants) are likely to be relatively indifferent to the transition period.

Commercial Customers

Currently, the metropolitan commercial usage charges are in three tiers:

- Usage from 1 to 600 kL is charged at $1.144 per kilolitre (kL).
- Usage from 601 to 1,100,000 kL is charged at $1.192 per kL.
- Usage above 1,100,000 kL is charged at $1.180 per kL.

Under current government policy, these three usage charges are to gradually converge to a single usage charge of $1.714 per kL (in real dollar values of 2009) by 2013/14. In addition to water usage charges, there are also fixed charges which are required to ensure total cost recovery. Any relative increase in the usage charge would be offset by a decrease in the fixed charge for a given levels of costs.

The Authority recommends that metropolitan commercial usage charges in 2012/13 be set at the same level as the second tier usage charge for residential customers ($1.83 per kL).

The Authority has considered whether the current method for allocating costs of water service provision in the metropolitan area between residential and non-residential customers, which is based on maintaining existing relativities, should be modified to achieve a more cost-reflective allocation.

The following submissions were received on this issue.

> Using price for efficient outcomes only becomes important where a price signal can be effective (such as volumetric charge). Where there is no price effective signal (for example, with fixed annual service charges) then social considerations including 'ability to pay' may justify cost recovery in differing proportions for different customer bases.
>
> Given the method used to determine current prices and the use of a regulatory asset value, there is no reason why residential and non-residential charges should be the same.
>
> Rebalancing the proportion may simply shift the current discount (from writing down the regulatory asset value) from residential customers to non-residential customers. Non-residential charges need only be considered for "rebalancing" if they are greater than the cost of the full replacement value of the assets.
>
> (Water Corporation submission, p41-42)
>
> A cost allocation model based on the volume of demand from customers is the most appropriate approach. That said, the outcomes of the modelling for such an approach will be important because the DTF would prefer a minimisation of the recovery of costs via the fixed charge from residential customers because of the dilution effect that would have on the effects of the price signal. (Department of Treasury and Finance submission, p15)

The Water Corporation does not consider that there should be any change to the method used to allocate costs between residential and commercial customers. That is, the allocation of costs that was implicit in the 2005 tariffs should continue. The Water Corporation view is that because the fixed charge does not influence water usage decisions, the charge can be set with reference to principles such as ability to pay (i.e. non-residential customers have a greater ability to pay than residential customers).

While the current reforms will result in usage charges for residential and commercial customers being set on a consistent basis, fixed charges differ substantially. The

residential annual fixed charge is currently $200.40 while small businesses currently pay $463.80.

The Authority has investigated whether a more cost-reflective method of allocating costs between commercial and residential customers can be achieved. One approach that has been considered is to:

- treat residential and small businesses on the same basis by aligning the 20mm meter charges for residential and commercial customers; and
- set charges for commercial customers with larger diameter meters on the basis that the cost increases with the square of the diameter of the meter (which is a commonly accepted principle in the water industry and is actually the basis for the current calculation of differentials in fixed charges).

This cost allocation method is currently applied to water businesses in New South Wales by the economic regulator in that State (the Independent Pricing and Regulatory Tribunal). This method is considered to be fair because there is a clear rationale for differences in payments between different types of customers.

The Authority has considered whether there is a reasonable case for immediately setting the usage charge for metropolitan commercial customers at $1.83 per kL and to immediately align the 20mm fixed charge to the residential fixed charge.

- Efficient prices, which signal to buyers and sellers the costs of producing goods and services, maximise welfare by directing resources towards their highest value use. Any delay in the move to cost-reflective usage charges therefore involves a cost, in the sense that welfare is not being maximised.
- The transition towards cost-reflective water usage charges for residential customers primarily addresses social issues, such as the impact of large price increases on tenants and low income households. However, there are no such social considerations in the case of commercial customers.
- Cost-reflective usage charges would encourage efficient water usage, including the development of recycled water projects that may become economically viable in a regime of cost-reflective commercial tariffs.

The impacts of immediately setting commercial tariffs at the efficient level versus transitioning to efficient tariffs over three years are shown in Table 2.8 and Table 2.9.

Table 2.8 Impact of Immediate Transition to Higher Usage Charges on Water Corporation Commercial Metropolitan Customers, Real Dollar Values of June 2009

	2011	2012	2013
Meter=20mm, Usage=300kL	4.8%	-6.5%	-6.9%
Meter=40mm, Usage=2ML	9.9%	-4.1%	-4.2%
Meter=100mm, Usage=20ML	13.0%	-2.5%	-2.5%
Meter=150mm, Usage=50ML	13.6%	-2.2%	-2.2%
Meter=200mm, Usage=400ML	18.1%	0.3%	0.3%

Table 2.9 Impact of Three Year Transition to Higher Usage Charges on Water Corporation Commercial Metropolitan Customers, Real Dollar Values of June 2009

	2011	2012	2013
Meter=20mm, Usage=300kL	-2.9%	-3.0%	-3.1%
Meter=40mm, Usage=2ML	-0.2%	0.6%	0.6%
Meter=100mm, Usage=20ML	1.7%	2.8%	2.7%
Meter=150mm, Usage=50ML	2.1%	3.2%	3.1%
Meter=200mm, Usage=400ML	5.3%	6.4%	6.0%

Given the significant impact on large commercial customers from setting usage charges at the efficient level immediately (an 18 per cent increase in one year), the Authority recommends transitioning to the recommended tariffs over the period to 2012/13. It is expected that the transition will not have a significant impact on the development of projects that increase water use efficiency because those projects are expected to take a number of years to implement and would be based on expected tariffs at the time the project becomes operational.

Aqwest's Customers

For Aqwest's customers, the Authority has considered four options:

- Option 1: increase all residential charges (including the fixed charge) at a constant rate to achieve cost recovery but cap the highest usage charge at the highest usage charge in Perth. In addition, merge the commercial usage charges to a single charge by 2012/13.

For the next three options, the Authority has aligned (by 2012/13) the fixed charge for residential customers and commercial customers with a 20mm meter. In addition, the commercial usage charges are merged and set equal to the third tier residential usage charge.

- Option 2: same as option 1 (with indicated adjustments to commercial charges).
- Option 3: same as option 1 (with indicated adjustments to commercial charges) but transition the residential fixed charge to the Perth residential fixed charge over the period to 2012/13.
- Option 4: set water usage charges at a discount below the Perth water usage charges, with the discount reflecting the difference in costs between Perth and Bunbury.[24] Over the period to 2012/13, the residential fixed charge is transitioned to the Perth residential fixed charge.

The options of having the residential fixed charge equal to Perth would result in Bunbury customers paying the same fixed charge as customers in surrounding towns supplied by the Water Corporation.

The four options are shown in Table 2.10.

[24] In addition, this option includes a usage charge between 350 and 500 kL to reflect a concern raised by Aqwest that there was too great a step between 150 kL and 500 kL.

Table 2.10 Tariff Options for Aqwest (Real Dollars of June 2009)

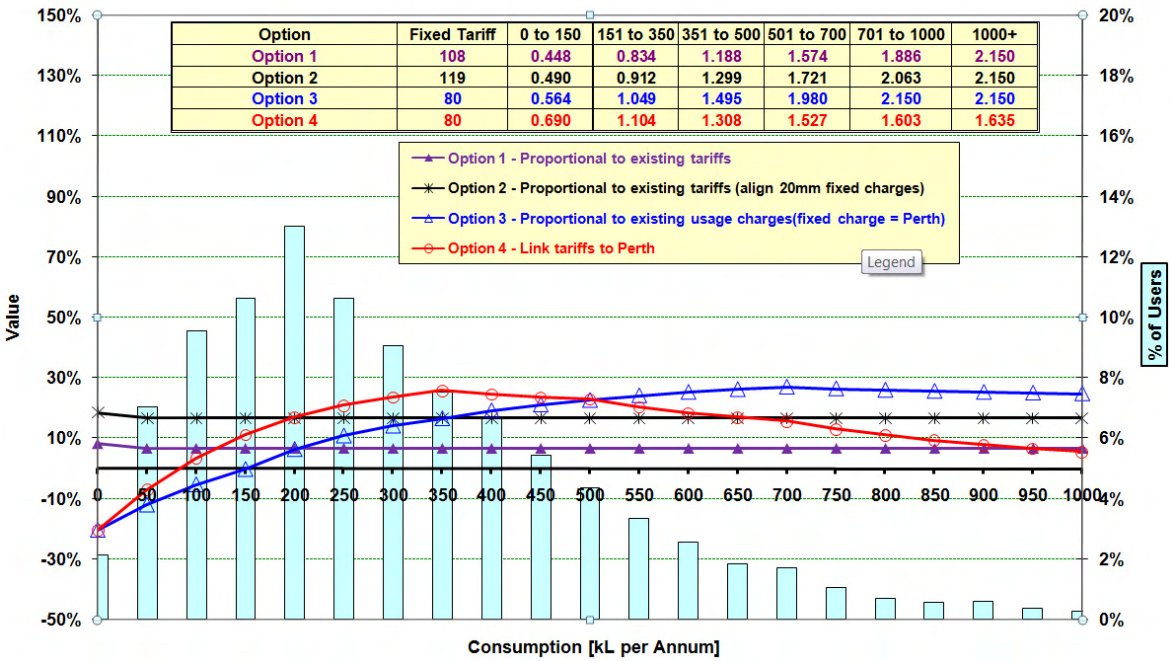
	2012/13			
	Proportional to existing tariffs (Option 1)	Proportional to existing tariffs (align 20mm fixed charges) (Option 2)	Proportional to existing usage charges (fixed charge = Perth (Option 3)	Link tariffs to Perth (Option 4)
Fixed Charge				
Residential	108.38	118.52	79.59	79.59
Non-Residential by Meter Size (mm)				
20	405.38	118.52	79.59	79.59
25	633.41	185.19	124.36	124.36
40	1,621.52	474.08	318.36	318.36
50	2,533.63	740.76	497.44	497.44
80	6,486.09	1,896.34	1,273.44	1,273.44
100	10,134.52	2,963.02	1,989.75	1,989.75
150	22,802.67	6,666.81	4,476.94	4,476.94
Demand Charge by Volume (kL)				
Residential				
0 - 150	0.45	0.49	0.56	0.69
151 - 350	0.83	0.91	1.05	1.10
351 - 500	1.19	1.30	1.50	1.31
501 - 700	1.57	1.72	1.98	1.53
701 - 1000	1.89	2.06	2.15	1.60
Over 1000	2.15	2.15	2.15	1.64
Non-Residential				
0 – 1000 kL	1.26	1.30	1.50	1.31
over 1000 kL	1.26	1.30	1.50	1.31

The alignment of the residential fixed charge with the commercial 20mm meter charge results in a $26 increase in the annual water payment for a household using 250 kL of water (the $26 would be phased-in over three years). The Authority considers that this alignment is important because it provides for an appropriate allocation of costs between commercial and residential customers. At present, commercial customers are paying more than their share of the costs of the water service (the impacts on commercial customers are shown later in Table 2.11). Given the Authority's recommendation to align the fixed charges of residential and small business customers, Option 1 is not considered further.

The financial impacts on residential customers of the other three options are presented in the following figures.

Figure 2.7 shows the increase in water payments (as a percentage) for Aqwest residential customers between 2009/109 and 2012/13 by annual water usage.

Figure 2.7 Tariff Options for Aqwest's Households: Percentage Increase in Water Payment from 2009/10 to 2012/13 by Water Usage (Real Dollars of June 2009)



Under the proportional option, the cost increases would be equally proportioned across all residential customers (all residential customers would face a bill increase of 17 per cent over the three years).

In comparison, under the option of setting the fixed charge at the Perth residential fixed charge, but increasing usage charges in line with the increase in costs (option 3), the average increase in bills would be the same, but this option would benefit those using less than 300 kL.

Under Option 4, if the Aqwest usage charges are set at $0.64 per kL less than the recommended usage charges for Perth (the amount required to reflect Aqwest's lower costs, while holding the fixed charge at the Perth level), customers with water usage between 150 kL and 500 kL would have the highest payment increases of the four options.

On balance, the Authority considers that option 3 results in the most appropriate impacts on customers.

Figure 2.8 Tariff Options for Aqwest's Households: Total Payment by Water Usage (as at 2009/10 and 2012/13, Real Dollars of June 2009)

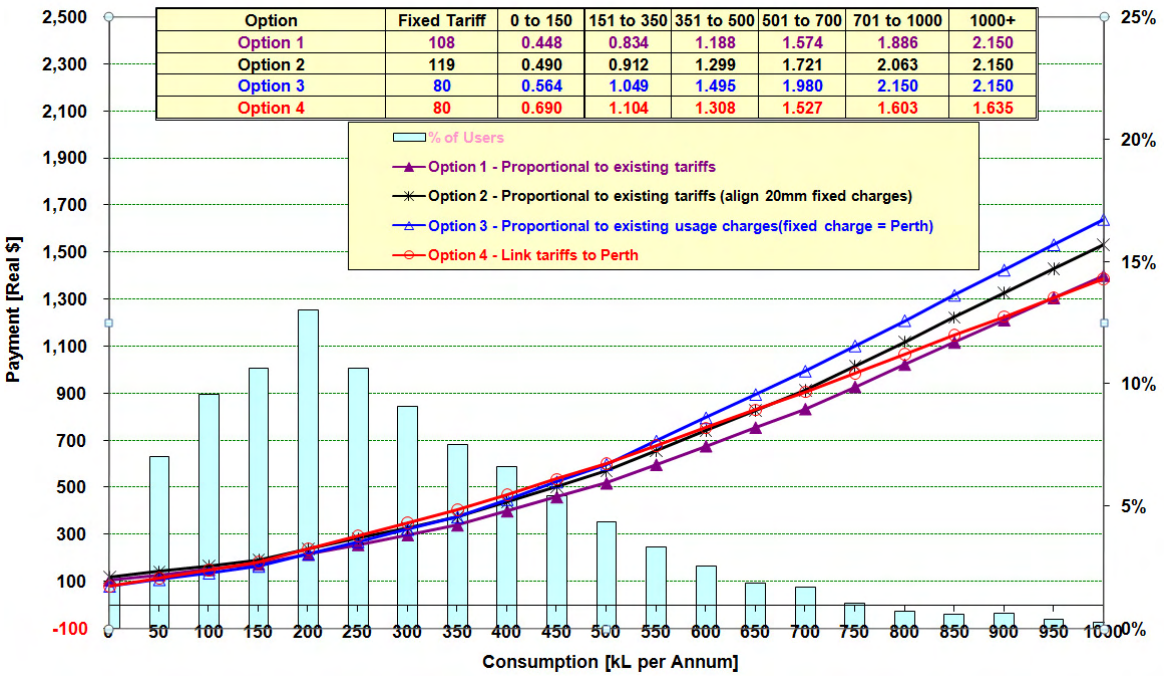
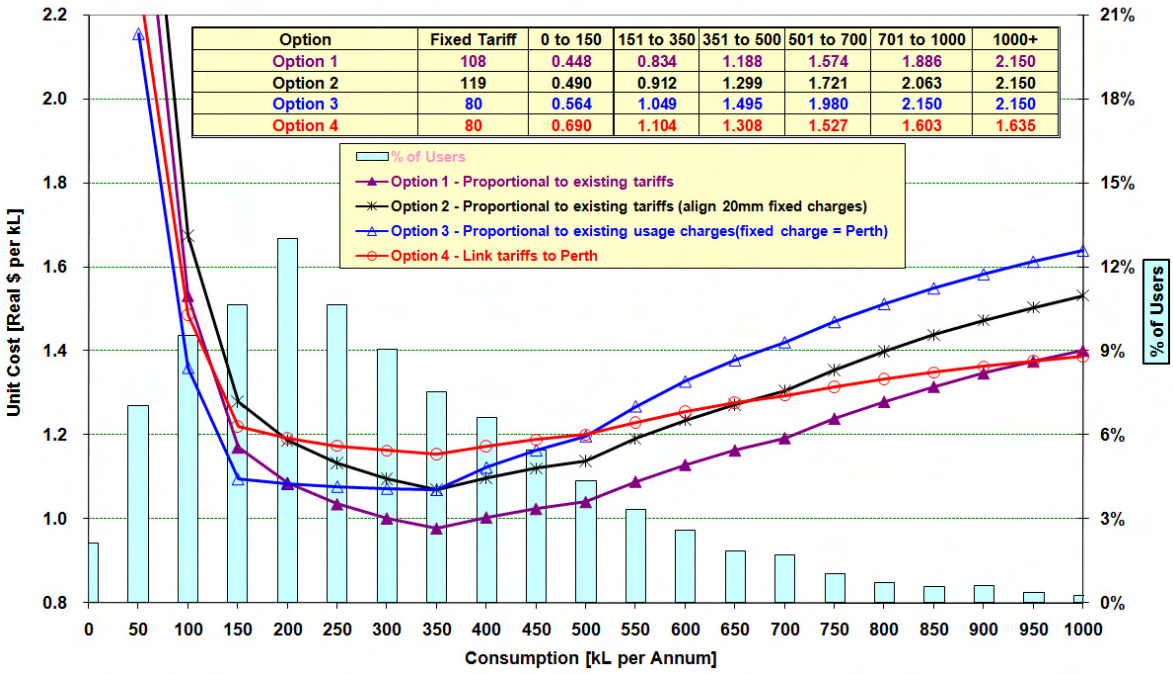


Figure 2.9 Tariff Options for Aqwest's Households: Average Cost per kL by Water Usage (as at 2012/13) Real Dollars of June 2009



For commercial customers, the impacts of Option 3 are as shown in Table 2.11. Most commercial customers benefit because of the alignment of the residential and 20mm fixed charge (and subsequent reduction to charges for higher capacity meters).

Table 2.11 Impact on Aqwest Water Commercial Customers Under Option 3 (Annual per cent Change, Real Dollar Value of June 2009)

	2011	2012	2013
Meter = 20mm, Usage = 250kL	-7.3%	-7.9%	-8.5%
Meter = 25mm, Usage = 1000kL	5.4%	5.1%	4.9%
Meter = 40mm, Usage = 2ML	-1.9%	-1.9%	-1.9%
Meter = 50mm, Usage = 5ML	0.2%	0.3%	0.3%
Meter = 80mm, Usage = 10ML	-2.5%	-2.5%	-2.6%
Meter = 100mm, Usage = 20ML	-0.9%	-0.9%	-0.9%
Meter = 150mm, Usage = 50ML	-0.4%	-0.4%	-0.4%

Overall, the Authority recommends that option 3 be used to set Aqwest's charges. The usage charges that would apply under option 3 retain the nature of Aqwest's current tariffs and are generally lower than the usage charges in Perth (given there is no apparent benefit in adopting the Perth tariff structure as a basis for setting charges in Bunbury). The Authority recommends that the tariffs be phased-in over a period of three years.

Busselton Water's Customers

For Busselton Water's customers, the Authority has considered the same four options as were considered for Aqwest:

- Option 1: increase all residential charges (including the fixed charge) at a constant rate to achieve cost recovery but cap the highest usage charge at the highest usage charge in Perth. In addition, merge the commercial usage charges to a single charge by 2012/13.

For the next three options, the Authority has aligned, by 2012/13, the fixed charge for residential customers and commercial customers with a 20mm meter. In addition, the commercial usage charges are merged and set equal to the third tier residential usage charge.

- Option 2: Same as option 1 (with indicated adjustments to commercial charges).
- Option 3: Same as option 1 (with indicated adjustments to commercial charges) but transition the residential fixed charge to the Perth residential fixed charge over the period to 2012/13.
- Option 4: Set water usage charges at a discount below the Perth water usage charges, with the discount reflecting the difference in costs between Perth and Busselton. The residential fixed charge is transitioned over the period to 2012/13 to the Perth residential fixed charge.

The four options are shown in Table 2.12.

Table 2.12 Tariff Options for Busselton Water (Real Dollars of June 2009)

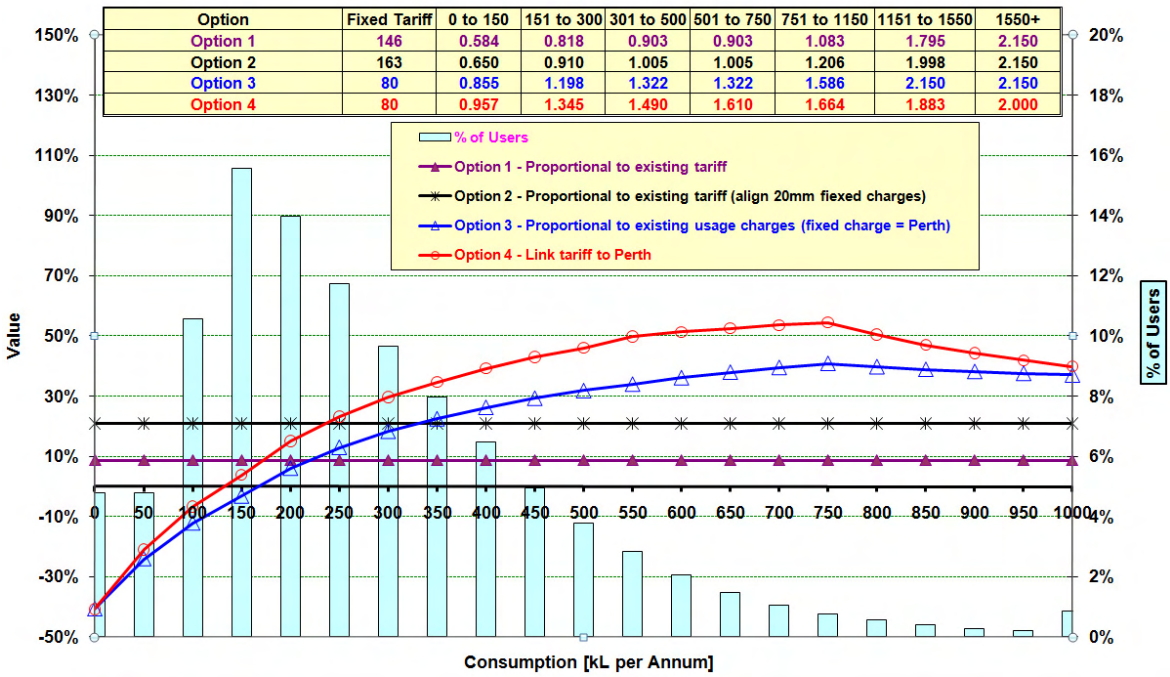
	2012/13			
	Proportional to existing tariffs (Option 1)	Proportional to existing tariffs (align 20mm fixed charges) (Option 2)	Proportional to existing usage charges (fixed charge = Perth) (Option 3)	Link tariffs to Perth (Option 4)
Fixed Charge				
Residential	145.99	162.54	79.59	79.59
Non-Residential by Meter Size (mm)				
20	467.35	162.54	79.59	79.59
25	730.24	253.97	124.36	124.36
40	789.82	274.70	318.36	134.51
50	1,869.40	650.17	497.44	318.36
80	2,920.94	1,015.89	1,273.44	497.44
100	7,477.61	2,600.68	1,989.75	1,273.44
150	11,683.76	4,063.56	4,476.94	1,989.75
Demand Charge by Volume (kL)				
Residential				
0 - 150	0.58	0.65	0.86	0.96
151 - 350	0.82	0.91	1.20	1.34
351 - 550	0.90	1.00	1.32	1.49
551 - 750	1.08	1.21	1.59	1.66
751 - 1150	1.79	2.00	2.15	1.88
1151 - 1550	2.15	2.15	2.15	2.00
1551 - 1950	2.15	2.15	2.15	2.00
Over 1950	2.15	2.15	2.15	2.00
Non-Residential				
0 – 1000 kL	1.49	1.00	1.32	1.49
over 1000 kL	1.49	1.00	1.32	1.49

The alignment of the residential fixed charge with the commercial 20mm meter charge results in a $13 increase in the annual water payment for a household using 250 kL of water (the $13 would be phased-in over three years). The Authority considers that this alignment provides for an appropriate allocation of costs between commercial and residential customers. Given the Authority's recommendation to align the fixed charges of residential and small business customers, Option 1 is not considered further.

The financial impacts on residential customers of the other three options are presented in the following figures.

Figure 2.10 shows the increase in water payments for Busselton Water residential customers from 2009/10 to 2012/13 by annual water usage, as a percentage.

Figure 2.10 Tariff Options for Busselton Water's Households: Percentage Increase in Water Payment from 2009/10 to 2012/13 by Water Usage (Real Dollars of June 2009)



Under the proportional option, the cost increases would be proportioned equally across all residential customers (all residential customers would face a bill increase of 21 per cent over the three years).

In comparison, under the option of setting the fixed charge at the Perth residential fixed charge, but increasing usage charges in line with the increase in costs (option 3), the average increase in bills would be the same, but those using less than 300 kL would benefit.

Under Option 4, if the Busselton usage charges are set at $0.41 per kL less than the recommended usage charges for Perth (the amount required to reflect Busselton Water's lower costs, while holding the fixed charge at the Perth level), customers would have the highest payment increases of all of the options.

On balance, the Authority considers that option 3 results in the most appropriate impacts on customers. As shown in Figure 2.10, option 3 results in most customers paying a similar average cost per kL of water used.

Figure 2.11 Tariff Options for Busselton Water's Households: Total Payment by Water Usage (as at 2009/10 and 2012/13, Real Dollars of June 2009)

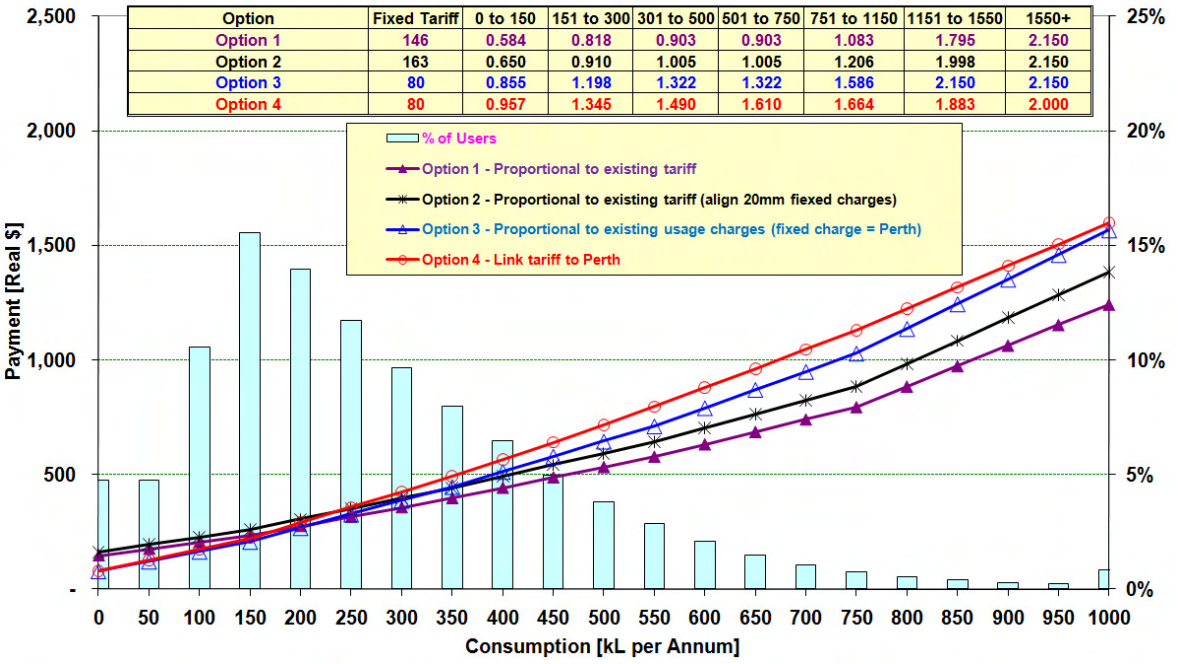
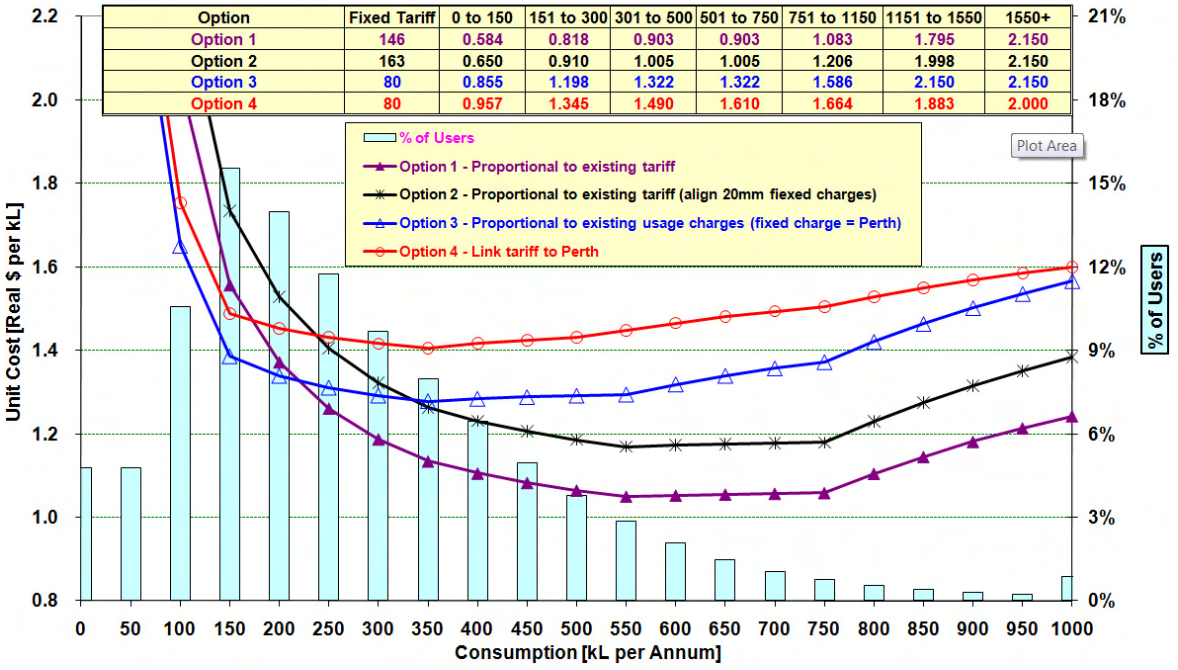


Figure 2.12 Tariff Options for Busselton Water's Households: Average Cost per kL by Water Usage (as at 2012/13, Real Dollars of June 2009)



For commercial customers, the impacts are as shown in Table 2.13. Most commercial customers benefit because of the alignment of the residential and 20mm fixed charge (and subsequent reduction to charges for higher capacity meters).

Table 2.13 Impact on Busselton Water Commercial Customers Under Option 3 (Annual per cent Change, Real Dollar Values of June 2009)

	2011	2012	2013
Meter = 20mm, Usage = 300kL	-13.0%	-14.9%	-17.5%
Meter = 25mm, Usage = 1000kL	-3.9%	-4.1%	-4.2%
Meter = 40mm, Usage = 2ML	-9.0%	-9.9%	-10.9%
Meter = 50mm, Usage = 5ML	-7.4%	-8.0%	-8.6%
Meter = 80mm, Usage = 10ML	-9.4%	-10.3%	-11.5%
Meter = 100mm, Usage = 20ML	-8.2%	-8.9%	-9.8%
Meter = 150mm, Usage = 50ML	-7.7%	-8.5%	-9.2%

Overall, the Authority recommends that option 3 be used to set Busselton Water's charges. The usage charges that would apply under option 3 retain the nature of Busselton Water's current tariffs and are for most customers are lower than the usage charges in Perth (there is no apparent benefit in adopting the Perth tariff structure as a basis for setting charges in Busselton). The Authority recommends that the tariffs be phased-in over a period of three years.

3 Country Water Usage Charges

3.1 Terms of Reference

This section contributes to addressing the following Terms of Reference.

> the Authority is to investigate and report on …
>
> - the appropriate charging structures and recommended tariff levels for the Water Corporation, Aqwest and the Busselton Water Boards' water supply services;

3.2 Recommendations

Recommendations

4) The uniform pricing policy be changed to a tariff cap policy to avoid customers in low cost country towns paying charges higher than the cost of providing the water service.

5) The threshold above which fully cost-reflective usage charges apply to country residential customers be lowered from 950 kL to 550 kL in the South and from 1,150 to 750 kL in the North.

3.3 Reasons

The Authority is aware that the Water Corporation is currently implementing a set of complex reforms to country water pricing. However, the Authority considers that the current reforms should be amended to change the uniform pricing policy to a tariff cap policy. Since the Authority last provided advice on country water pricing, the cost of water in Perth has increased significantly. If the uniform pricing policy were to be continued, residential customers in low cost country towns would pay charges higher than the costs of providing the water service.

The Authority also considers that the current threshold for applying fully cost-reflective usage charges in the country is too high and that the threshold should be lowered (from 950 kL to 550 kL in the South of the State and from 1150 to 750 kL in the North of the State). The recommended thresholds are higher than the volume of water that would typically be used by households with six members. High volume customers could avoid higher charges by lowering their water usage.

Regarding the uniform pricing policy, the Authority also considers that there is merit in considering a reduction in the uniform tariff threshold which is currently set above what may be considered reasonable to meet essential water needs (in the south of the State it is currently set at 300 kL per year whereas a more reasonable approximation of essential water use may be 150 kL per year). The Authority has not made a recommendation on this matter in this report because of the financial impacts on some customers. However, it may be appropriate to reconsider the appropriate level of the threshold at the next regulatory review.

3.4 Background

The Water Corporation commenced reforms to country water usage charges from 1 July 2008. These reforms follow a decision by Government which was based on earlier advice from the Authority (as part of the Inquiry on Country Water and Wastewater Pricing) and advice from an implementation committee. The new pricing arrangements will be more cost-reflective than the previous arrangements.

- Country towns are classified on a cost-basis into five groups for the purpose of residential charging and into 15 groups for the purpose of non-residential charging.[25]
- Under the uniform pricing policy, residential customers pay the metropolitan fixed charge and metropolitan usage charges up to 300 kL in the South (500 kL in the North).[26] These thresholds were reduced by 50 kL on 1 July 2008.
- Tariffs are being transitioned to a four-tier structure:
  - tier 1 is the uniform price;
  - tier 4 is the lesser of the net demand cost per kL for the group of towns or the cap, which is set at $5 (in real dollars of 2006);
  - the tariff for tiers 2 and 3 are calculated on the basis that the percentage increase between tiers is constant.[27]
- Non-residential customers pay a single usage charge (equal to the tier 4 charge). The Government decided that CSO payments would not be paid to non-residential country customers. The fixed tariffs for non-residential country customers are the same as for non-residential metropolitan customers.

3.5 Assessment

Submissions requested that the Authority consider the following issues:

- replacement of the uniform pricing policy with a "tariff cap policy", which provides for towns that have a lower cost than Perth to pay a lower usage charges than would occur under the uniform pricing policy (Department of Water and Department of Treasury and Finance).
- a reduction in the uniform pricing threshold to cover essential water usage only (Water Corporation).
- replacement of the uniform pricing policy with a targeted subsidy program and the establishment of cost-reflective pricing in country towns (Department of Treasury and Finance).

[25] The grouping is done on the basis of net demand cost per kL of each town. Net demand cost per kL = (gross cost of service – non-regulated revenue – fixed revenue) / (commercial volume + residential volume). The thresholds for allocating towns to groups are calculated as the average of two adjacent usage charges (which results in a town being assigned the tariff that most closely relates to its net demand cost per kL). The reason for more groups for non-residential customers is to minimise the jump in charges that would otherwise occur when towns are reassigned to a higher group (residential customers are insulated due to the uniform pricing policy).

[26] "North" is defined as any town above the 26th parallel, as well as in the towns of Cue, Laverton, Leonora, Meekatharra, Menzies, Mt Magnet, Sandstone, Wiluna and Yalgoo. "South" is defined as the rest.

[27] The implication of this method is that tariffs will only change if either the uniform price changes or the cap changes. However, if a town's net demand cost per kL changes significantly (in real terms), then it would be reclassified to a different group.

In addition, the Authority has considered whether the thresholds for applying full cost-reflective pricing should continue to be set at 950 kL per year in the South and 1,150 kL per year in the North, or whether lower thresholds would be appropriate.

3.5.1 Tariff Cap Policy Rather than Uniform Pricing Policy

If metropolitan residential water charges are changed as recommended, country water charges will also change as a result of the uniform pricing policy. There are two offsetting impacts: the impact of higher usage charges and the impact of a lower fixed charge.

The Authority has investigated whether the application of the uniform pricing policy results in residential customers in any towns being charged more for water than is warranted (e.g. towns that are unlikely to require significant source expenditure in the coming years, or towns that are less costly on a per kL basis than Perth). If this is the case, then it may be appropriate to modify the uniform pricing policy to provide for some towns to pay less than the uniform price while retaining the uniform prices for towns which have higher costs than Perth.

Commercial water charges in the country will not be impacted by higher Perth charges because the uniform pricing policy does not apply to commercial customers. Instead, commercial usage charges are calculated independently for groups of towns.

Under the current reforms, the residential usage charges in the country would be phased-in to the charges shown in Table 3.1.

Table 3.1 Residential Usage Charges That Would Apply from 2013/14 for Country Towns in the South if the Uniform Pricing Policy is Continued, Real Dollars of June 2009

	Usage (kL / year)				
Town	1-150	151-300	301-550	551-950	951+
Class 1	1.40	1.83	1.83	1.83	1.83
Class 2	1.40	1.83	2.02	2.21	2.40
Class 3	1.40	1.83	2.27	2.71	3.15
Class 4	1.40	1.83	2.60	3.36	4.13
Class 5	1.40	1.83	3.02	4.22	5.41

The current approach has charges in the country at least as high as the charges in Perth (specifically, those charges that apply in Perth below 300 kL/year). However, the cost-reflective charges for water usage above 300 kL in Classes 1 and 2 are lower than $1.83 per kL, and significantly lower for Class 1 towns. Table 3.2 shows the usage charges if the charges above the uniform pricing threshold (300kL) are set to be cost-reflective (after taking into account the revenue received from uniform prices – both fixed and usage charges).

Table 3.2 Residential Usage Charges That Would Apply from 2013/14 for Country Towns in the South if the Uniform Pricing Policy is Continued and Cost-reflective Charges are Applied Above the Uniform Pricing Threshold, Real Dollars of June 2009

	Usage (kL / year)				
Town	1-150	151-300	301-550	551-950	951+
Class 1	1.40	1.83	1.44	1.46	1.48
Class 2	1.40	1.83	1.90	1.98	2.05
Class 3	1.40	1.83	2.16	2.50	2.83
Class 4	1.40	1.83	2.52	3.22	3.91
Class 5	1.40	1.83	3.02	4.22	5.41

To remove the anomalies of customers in some towns paying more than the cost of the service, and having usage charges decline as water usage increases, the Authority considered a reduction in the usage charges for those towns (while maintaining a uniform fixed charge).

To minimise the risk that customers in some towns have a lower tariff than is warranted, the Authority considered the grouping of towns on the basis of 15 groups rather than five.

Submissions

The Water Corporation does not support changing from a uniform pricing policy to a tariff cap policy. First, the Water Corporation submitted that equity can be defined in a number of ways other than cost reflectivity, and that uniform prices are regarded as equitable by many in the community and by Government.

> There is an underlying assumption carried through the recommendations of the Draft Report that equity is achieved with cost-reflective prices. The Corporation is aware that many people in the community have alternative views on equity, including support for uniform charges and charges based on ability to pay.
>
> Government has continued to reinforce the concepts of uniformity and 'ability to pay' as important concepts of fair prices through numerous pricing decisions.
>
> A tariff cap policy for country usage charges reflects a value judgement that the uniform pricing policy is in place to protect customers from the adverse impact of cost-reflective prices. This is different from the view that it is equitable for all customers to pay the same amount for a service, regardless of the cost.
>
> (Water Corporation submission on Draft Report, Part B, p10)

Further, the Water Corporation submitted:

> The few "low" cost schemes identified in the report are predominately the result of a combination of factors associated with the methodology adopted by the ERA's pricing model, rather than reflecting the actual average cost of supply. These factors include:
>
> - The treatment of special agreement revenue – which is calculated based on the notional cost of scheme augmentation. A scheme with a high proportion of special agreement usage / revenue can underestimate the actual average cost of supply, particularly if special agreement customers negotiate to make their capital contributions through their volumetric charge;

- The determination of the initial asset value – which may not reflect the optimised replacement cost of the assets;
- The assumption that all assets are the same average age and have the same remaining useful life; and
- The limitations inherent in any model that seeks to apportion shared costs between integrated schemes.

The Water Corporation also submitted that a reduction in tariffs for low cost towns would encourage higher water use in those towns.

> The outcome of the proposed tariff cap policy would be that a small number of country customers could pay very low volumetric charges (30c/kL). The lower prices would increase the cost to the taxpayer of supporting the uniform pricing policy. Additionally, many in the community would challenge whether there should be an incentive to encourage higher consumption just because the current cost of the scheme is low.
>
> (Water Corporation submission on Draft Report, Part B, p10)

The Water Corporation did not support the Authority's proposal to increase the number of town groups from 5 to 15, on the grounds that 15 classes would be too complex and costly to administer.

> The idea of increasing the number of classes contradicts the Corporation's aim of simplifying its tariff structure where possible.
>
> There is no reason why there needs to be same number of scheme bands for residential and non-residential charges, and it shouldn't be implemented simply for the sake of "modelling symmetry". The additional number of classes needs to be justified by comparing the cost of the administrative requirements against the potential efficiency benefits from more cost-reflective price. These benefits would be minimal, particularly if the uniform tariff threshold remained at 300 kL.
>
> Increasing the residential scheme classes to 15 groups actually means increasing it to 30 groups because of the split into the north and south country regions. This is technically feasible, but will become administratively complex and costly to implement and maintain.
>
> Under the current tariff structure, which caters for 5 classification groups, there has been a need to establish 55 associated rate schedules in Grange (the Corporation's billing software) for both north and south country regions. This is due to the variation in billing business rules applicable to such scenarios as community/residential, common supply and master/sub-meter arrangements. Increasing the number of classes from 5 to 15 will mean an additional 110 new rate schedules will need to be created. This will effectively triple the administrative effort required to maintain the rate schedules for country water use, add additional operating costs and cause a greater risk of errors.
>
> (Water Corporation submission on Draft Report, Part B, p15)
>
> The points noted above are not intended as a criticism of the pricing model (which the Corporation supports) but are noted simply to the highlight pragmatic constraints inherent in any approach.
>
> (Water Corporation submission on Draft Report, Part B, p16)

Assessment

The Authority does not accept the Water Corporation's contention that it can be considered equitable for some towns to pay more than the cost of their water service.

Unprofitable schemes in the country should not be supported by other water customers but by CSOs and this is an appropriate and transparent way of providing financial support to customers in country schemes.

In considering whether it would be appropriate at this time to reclassify towns into 15 groups (for the purpose of setting residential water tariffs), the Authority has observed that such a change would make the grouping of towns for residential purposes consistent with the grouping for non-residential charging purposes. A further reason for having 15 groups is that, when towns are periodically reclassified between classes (as their costs change), the change in usage charges would be less than if there were only five groups.

However, the Authority notes the Water Corporation's concern about the administrative costs associated with moving to 15 groups. The Authority also examined whether five classes provides sufficient flexibility to classify towns into groups that would have cost-reflective tariffs which are lower than Perth tariffs and has concluded that there is sufficient flexibility with five groups. With this grouping, towns with costs less than Perth can be placed into the first class.

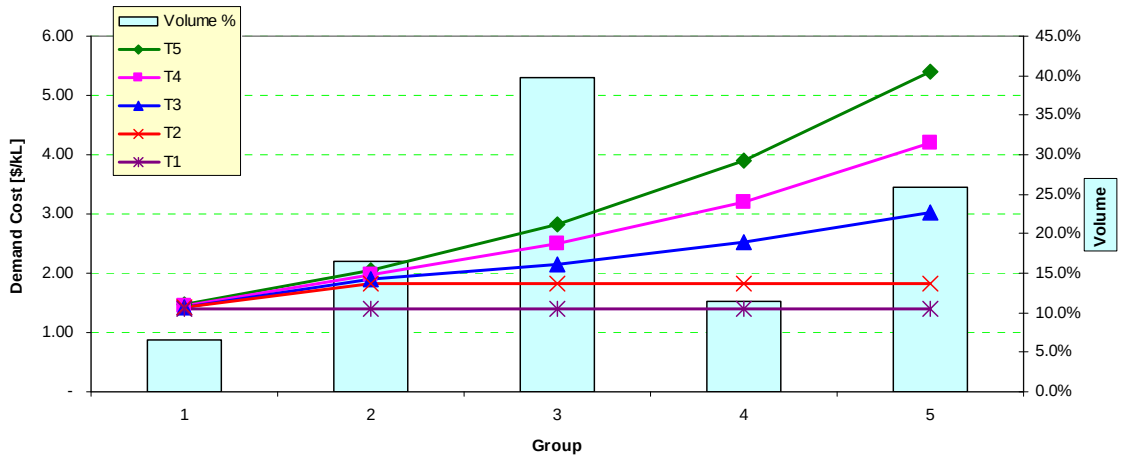
Under this approach, usage charges for each class could be as shown in Table 3.3. The usage charge for class 1 is set to include only towns that have lower costs than Perth.

Table 3.3 Residential Tariffs That Would Apply from 2013/14 for Country Towns in the South under a Tariff Cap Policy (Real Dollars of June 2009)

	Usage (kL / year)				
Town	1-150	151-300	301-550	551-950	951+
Class 1	1.40	1.42	1.44	1.46	1.48
Class 2	1.40	1.83	1.90	1.98	2.05
Class 3	1.40	1.83	2.16	2.50	2.83
Class 4	1.40	1.83	2.52	3.22	3.91
Class 5	1.40	1.83	3.02	4.22	5.41

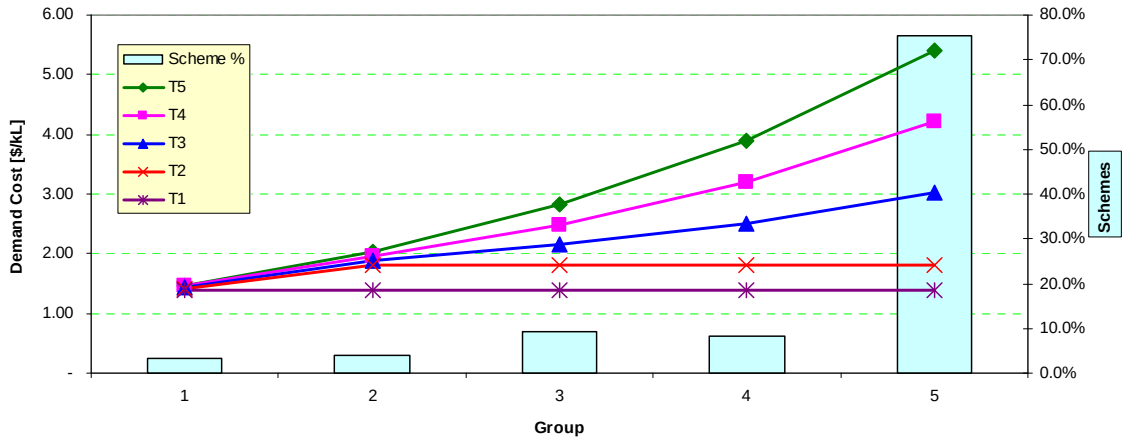
Figure 3.1 illustrates the data in Table 3.3 along with the percentage of customers within each class. The lines in Figure 3.1 show the five tiers of usage charges within each class. For class 1 there is a flat usage charge; for class 2 the usage charge is almost constant; while for groups 3, 4 and 5 there are five tiers of usage charges. The columns in Figure 3.1 show the percentage of country residential water customer volume within each town group.

Figure 3.1 Residential Tariffs for Country Towns in the South under a Tariff Cap Policy and Distribution of Customer Volume across Groups (Real Dollars of June 2009)



While the distribution of customers is as shown above, the greatest number of towns are in group 5, as is shown in Figure 3.2.

Figure 3.2 Residential Tariffs for Country Towns in the South under a Tariff Cap Policy and Distribution of Towns across Groups (Real Dollars of June 2009)



Under this option, annual CSO payments for the Water Corporation's country water operations are estimated to be $246.4 million, compared to $246.6 million if the current approach were to be continued (i.e. an annual reduction of $0.2 million).

Overall, the Authority considers that customers in low cost towns should no longer pay the uniform prices but rather usage charges that do not result in any over-recovery of revenue. The Authority recommends that the uniform pricing policy be changed to a "tariff cap policy".

3.5.2 Reduction in the Uniform Pricing Threshold

An issue for water pricing is whether the thresholds for the subsidised usage charges in the country are set appropriately. As part of the Inquiry on Country Water and Wastewater Pricing, the Authority recommended, and the Government agreed to, lowering the (uniform pricing) threshold by 50 kL per household per year, to 300 kL for towns in the

south of the State and 500 kL for towns in the north. This recommendation was made on the basis that these thresholds still exceed the average in-house consumption of a large residential household, and so would not compromise the Government's objective of providing all households with affordable water to meet basic needs. The Water Corporation has suggested that this assumption be re-examined to determine whether the threshold could be lowered to 150 kL (with a corresponding reduction in the CSO). However, as indicated above, the Water Corporation has indicated that the social impacts of lowering the threshold need to be weighed against the efficiency impacts.

There is some empirical analysis that would support reducing the threshold for subsidised usage charges. "Optimal access" is defined by the World Health Organisation as 100 litres per capita per day and above, supplied through multiple taps continuously.[28] At this service level, all basic needs for drinking water, hygiene, bathing and laundry are met, and the level of health concern is very low. Other authors also support a basic water requirement of 100 litres per capita per day (which is the typical household demand in water-scarce regions) to provide for a minimum acceptable quality of life.[29] This quantity is equivalent to an annual consumption of just under 150 kL for a four-person household.

The usage charges that would apply under the tariff cap policy, with the threshold reduced to 150 kL, are shown in Table 3.4.

Table 3.4 Residential Usage Charges for Country Towns in the South under the Tariff Cap Policy with a Threshold of 150 kL (Real Dollars of June 2009)

	Usage (kL / year)				
Town	1-150	151-300	301-550	551-950	951+
Class 1	1.40	1.42	1.44	1.46	1.48
Class 2	1.40	1.56	1.72	1.89	2.05
Class 3	1.40	1.76	2.12	2.47	2.83
Class 4	1.40	2.03	2.66	3.29	3.91
Class 5	1.40	2.40	3.41	4.41	5.41

The impact on customers is shown in Table 3.5. It can be seen that the reduction in the threshold does not impact on class 1 customers because their usage charges are fixed. Payments are reduced for classes 2 and 3 and increased for classes 4 and 5 customers. The reduction for classes 2 and 3 is caused by an assumption that the tariff increases from the respective threshold to tier 5 are spread evenly. For example, for class 2, the dollar increase from tier 1 (the tariff at the new threshold) to tier 2 (approximately $0.16 as shown in Table 3.4) is the same as the dollar increase from tier 2 to tier 3, and so on. As a result, the tariffs above the uniform pricing threshold can be lower than the uniform usage tariffs that would otherwise apply between 150 kL and 300 kL per year.

The payment increases for classes 4 and 5 customers (as shown in Table 3.5) are a result of tariffs above the uniform pricing threshold being higher than would otherwise apply.

Given the net (positive and negative) impacts on customers, there is not a significant impact on CSO payments (the annual CSO payment is $1 million higher compared to the option of retaining the threshold at 300 kL).

[28] World Health Organization (2003), "Domestic Water Quantity, Service, Level and Health".

[29] Falkenmark, M. (1991), "Approaching the ultimate constraint: water-short Third-World countries at a fatal cross-road", Study Week on Resources and Population, Pontifical Academy, 17-22 November 1991, Vatican City.

Table 3.5 Variations in Payments by Residential Customers by Reducing the Threshold from 300 kL to 150 kL ($ per Year, Real Dollars of June 2009)

	Usage (kL / year)					
	100	200	300	400	500	600
Class 1	-	-	-	-	-	-
Class 2	-	-13	-40	-58	-76	-89
Class 3	-	-4	-11	-16	-20	-24
Class 4	-	10	30	43	56	66
Class 5	-	29	86	124	162	191

Lesser reductions in the threshold would have different financial impacts. For example, if the threshold were reduced by 50 kL to 250 kL the usage charges would be as shown in Table 3.6.

Table 3.6 Residential Usage Charges for Country Towns in the South under the Tariff Cap Policy with a Threshold of 250 kL (Real Dollars of June 2009)

	Usage (kL / year)				
Town	1-150	151-250	251-550	551-950	951+
Class 1	1.40	1.42	1.44	1.46	1.48
Class 2	1.40	1.83	1.90	1.98	2.05
Class 3	1.40	1.83	2.16	2.50	2.83
Class 4	1.40	1.83	2.52	3.22	3.91
Class 5	1.40	1.83	3.02	4.22	5.41

The financial impacts of lowering the threshold to 250 kL would be as shown in Table 3.7. Customers are either not impacted or are worse off under this scenario. However, the increase in class 5 customer payments are significantly reduced in comparison to the impact under a threshold of 150kL.

Table 3.7 Variations in Payments by Residential Customers by Reducing the Threshold from 300 kL to 250 kL ($ per Year, Real Dollars of June 2008)

	Usage (kL / year)					
	100	200	300	400	500	600
Class 1	-	-	1	1	1	1
Class 2	-	-	4	4	4	4
Class 3	-	-	17	17	17	17
Class 4	-	-	35	35	35	35
Class 5	-	-	60	60	60	60

Submissions

The Authority invited comments on the proposal to lower the threshold to 150 kL.

Water Corporation did not have a view and deferred this decision to the Government:

> [I]it is for Government to state what it intends [the uniform tariff] threshold limit to be. It is a social policy decision, with the impact of a reduced threshold weighed up against the potential benefits of sending a more efficient pricing signal.
>
> Similar to the tariff cap, reducing the uniform tariff threshold from 300kL embodies an assumption that it is equitable to protect customers from cost-reflective prices for essential water use, rather than it being equitable for all customers to pay the same for average water use.
>
> Is the policy about providing the same level of lifestyle and amenity for country customers, or just ensuring an essential volume of water is available at an affordable price?
>
> One difficulty in using the 150 kL based on the average internal usage of an "average" house is that large families will have to pay a higher price for some of their nondiscretionary use.
>
> (Water Corporation submission on Draft Report, p13-14)

Overall, the Authority considers that lowering the threshold to 150 kL would better target the CSO to essential water usage. However, the financial impacts on households in class 5 are significant (an additional $86 on the total bill for a household using 300 kL per year). The Authority has not made a recommendation on this matter in this report because country water pricing is currently undergoing a complex set of reforms involving the reclassification of towns into more cost-reflective groupings. However, the Authority considers that it would be appropriate to consider the appropriate level of the threshold at the next regulatory review.

3.5.3 Replacement of the Uniform Pricing Policy

The Department of Treasury and Finance suggested that the Authority consider the option of replacing the uniform pricing policy with a targeted subsidy scheme.

> As a signatory to the National Water Initiative Intergovernmental Agreement (the NWI), the State is bound to continued movement towards upper bound pricing and full cost recovery, which could be achieved through the separation of water pricing structures and the delivery of the Government's social policy objectives.
>
> …
>
> [The social objective] parameters for the Uniform Pricing Policy (UPP) were based on the assumption that country customers should not be penalised for living in the country areas by paying significantly higher water charges. However, while regional development is supported, the ongoing 'broad-brush' nature of the subsidies provided to country areas through the UPP is not supported, on the grounds of a lack of efficiency in the allocation of the scarce resource. Continuing to provide such subsidies to country areas is clearly inefficient, resulting in a net welfare loss to the broader community.
>
> A more appropriate alternative method of social policy delivery may be a targeted subsidy program which is means tested on an annual basis.
>
> (Department of Treasury and Finance submission, p7)

The Authority acknowledges that the extent of the targeting of the uniform pricing policy is limited:

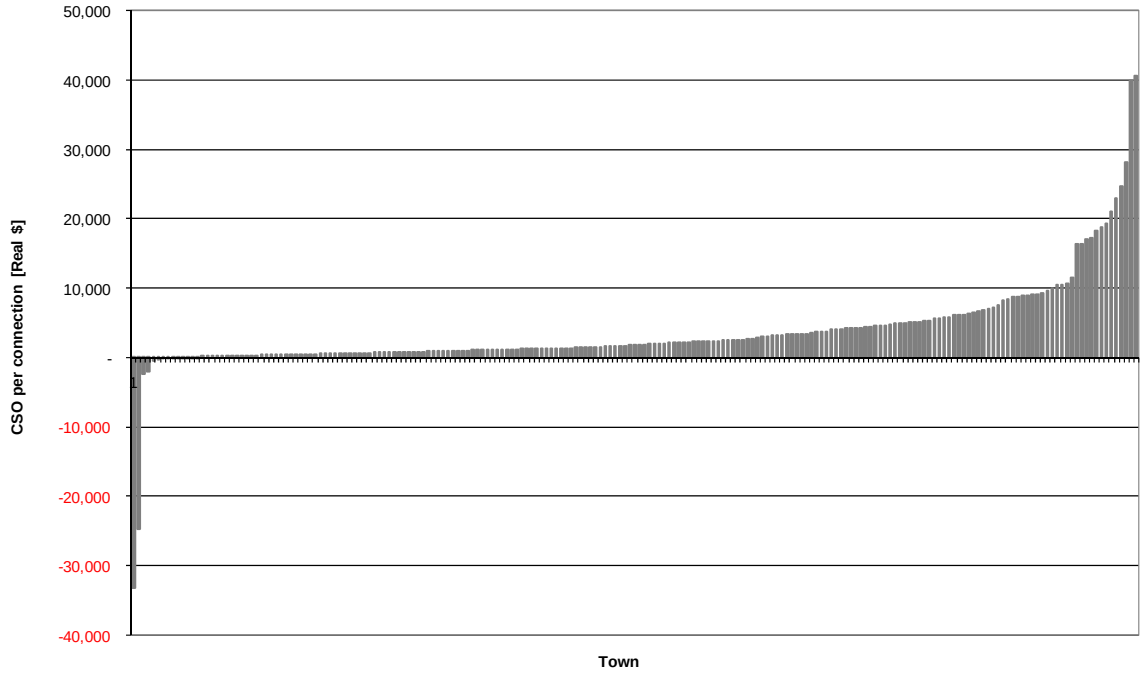
- It benefits residences in the north and south of the State (the uniform pricing threshold is higher in the North by 200 kL).
- The effective subsidy declines as a customer uses more than the uniform pricing threshold (usage charges are more cost-reflective above the threshold).

The Authority does not consider it to be within the scope of this inquiry to identify an alternative mechanism to provide targeted subsidies. The Authority has considered, however, the Department of Treasury and Finance's proposal that subsidies not be delivered through water charges.

Under a strictly cost-based approach, the cost of providing the service to the town would be recovered in the combination of water usage charges and fixed charges. The water usage charge would be set in relation to the value of water and the fixed charge would be set to ensure the revenue from customers matched the total cost of providing the service. There would be no CSO payment.

An issue with not providing any CSO payment is that the current CSO per customer in many country towns is high (e.g. more than $10,000 per year). Figure 3.3 shows the distribution of CSO per customer across the country towns with more than 20 connections. Towns with the highest CSO per connection are generally towns with relatively few customer connections.

Figure 3.3 Average CSO per Connection across Country Towns (Real dollars of June 2009)



If water usage charges were set to reflect the value of water in each town the fixed charges in high cost towns would need to be very high to generate enough revenue to recover costs.

An alternative way of showing what the tariffs would be under this approach is to maintain a uniform fixed charge but set usage charges to recover the average per kL cost of the scheme (after taking into account the revenue from the fixed charge). The resulting usage charges would be as shown in Table 3.8. (These are the same charges as in Table 3.6 for tier 5, usage of 951^{+} kL per annum).

Table 3.8 Possible Country Residential Usage Charges if the "Tariff Cap Policy" were Replaced with a Uniform Fixed Charge and Usage Charges Were Set to Recover the Average per kL Cost of the Scheme (Subject to a Cap for Class 5, Real Dollars of June 2009)

Town	Flat Usage Charge
Class 1	1.48
Class 2	2.05
Class 3	2.83
Class 4	3.91
Class 5	5.41

The variations in payments by residential customers if the "tariff cap policy" were replaced with a uniform fixed charge and usage charges were set to recover the average per kl cost of the scheme (subject to a cap for class 5), are shown in Table 3.9. Compared to applying tariffs consistent with a "tariff cap policy", the impacts on customers in classes 3 to 5 would be substantial.

Table 3.9 Variations in Payments by Residential Customers if the "Tariff Cap Policy" were Replaced with a Uniform Fixed Charge and Usage Charges Were Set to Recover the Average per kL Cost of the Scheme (Subject to a Cap for Class 5), Real Dollars of June 2009

	Usage (kL / year)					
	100	200	300	400	500	600
Class 1	8	15	21	25	29	32
Class 2	65	108	130	144	159	170
Class 3	143	265	365	432	498	548
Class 4	251	481	690	829	968	1,072
Class 5	401	781	1,139	1,378	1,616	1,796

Overall, the Authority considers that if the Government wishes to explore the option of replacing the uniform pricing policy with more cost-reflective charges (combined with targeted subsidies delivered in some way other than through water charges), then one option would be to apply a uniform fixed charge and set usage charges to better reflect the costs of the scheme. However, this option would result in substantial increases in water charges for many country towns which may then need to be offset in some way. This option would also result in water usage charges that in many circumstances would be higher than the long run marginal cost.

3.5.4 Applying Full Cost-reflective Pricing Above 550 kL

Under the current tariffs, full cost-reflective pricing applies to residential customers above 950 kL in the south and above 1,150 kL in the north. The Authority has considered whether it would be appropriate to lower this threshold to 550 kL in the South and 750 kL in the North.

The usage charges that would apply if full cost-reflective pricing were to apply above 550 kL in the South and 750 kL in the North are shown in Table 3.10.

Table 3.10 Residential Usage Charges for Country Towns under the Tariff Cap Policy with a Threshold for Full Cost-reflective Pricing Set at 550 kL in the South and 750 kL in the North (Real Dollars of June 2009)

	Usage (kL / year)			
South	**1-150**	**151-300**	**301-550**	**551+**
North	**1-350**	**351-500**	**501-750**	**751+**
Class 1	1.40	1.43	1.45	1.48
Class 2	1.40	1.83	1.94	2.05
Class 3	1.40	1.83	2.33	2.83
Class 4	1.40	1.83	2.87	3.91
Class 5	1.40	1.83	3.62	5.41

The impact on customers is shown in Table 3.11. For example, the table shows that customers in Class 5 using 600 kL per year in the South or 800 kL per year in the North would pay an additional $209 per year. It should be noted that a large household (with six occupants and a garden) in the South would be expected to consume around 500 kL per year, and in the North, around 700 kL per year.

Table 3.11 Variations in Payments by Residential Customers by Reducing the Threshold for Full Cost-reflective Pricing to 550 kL in the South and 750 kL in the North ($ per Year, Real Dollars of June 2009)

	Usage (kL / year)			
South	**600**	**650**	**700**	**750**
North	**800**	**850**	**900**	**950**
Class 1	5	6	7	8
Class 2	13	16	20	24
Class 3	58	75	92	108
Class 4	122	156	191	226
Class 5	209	269	328	388

If the current approach were to be continued, annual CSO payments for the Water Corporation's country water operations are estimated to be $246.4 million. Under the option of lowering the threshold to 550 kL in the South and 750 kL in the North), annual CSO payments are estimated to be $243.2 million (a reduction of $3.2 million).

Overall, the Authority considers that applying cost-reflective pricing above 550 kL in the South and above 750 kL in the North would better signal the cost of service provision in expensive country towns to those customers using large amounts of water.

3.5.5 Conclusion

The Authority is aware that the Water Corporation is currently implementing a set of complex reforms to country water pricing. However, the Authority considers that the current reforms should be amended to change the uniform pricing policy to a tariff cap policy, to allow for customers in low cost towns to pay tariffs that are less than the Perth tariffs.

The Authority also considers that the current threshold for applying fully cost-reflective usage charges in the country is too high and that the threshold should be lowered (from 950 kL to 550 kL in the South of the State and from 1,150 to 750 kL in the North of the State).

Regarding the uniform pricing policy, the Authority also considers that there is merit in considering a reduction in the uniform tariff threshold which is currently set above what may be considered reasonable to meet essential water needs (in the south of the State it is currently set at 300 kL per year whereas a more reasonable approximation of essential water use may be 150 kL per year).

4 Wastewater Charges

4.1 Terms of Reference

This section contributes to addressing the following Terms of Reference:

> the Authority is to investigate and report on …
>
> - the appropriate charging structures and recommended tariff levels for the Water Corporation's wastewater services;

4.2 Recommendations

Recommendations

6) Residential wastewater charges be no longer based on property values but instead be based on an annual average fixed charge.

7) The transition away from property valuation-based residential wastewater charges be over a period of three years.

8) The current fixture-based method of charging non-residential customers for wastewater services is appropriate.

4.3 Reasons

The Authority considered various alternatives for pricing of residential wastewater services, which are currently charged on the basis of gross rental values. Under this approach, there is little if any relationship between the price charged and the cost of the service, and the correlation between property values and income is not strong (25 per cent of lower-income households are in above-average valued properties).

The Water Corporation proposed that the current residential wastewater pricing approach be replaced with an average fixed charge. The Authority supports this approach, which is more cost reflective than property-based prices and would be simple to implement. Further improvements in cost reflectivity, such as basing wastewater charges on estimated winter water usage, could be implemented in the future if appropriate.

A transition period of three years is recommended to minimise the financial impacts on customers (particularly for customers currently in relatively low valued properties).

The Authority considers the current approach to commercial wastewater pricing, based on the number of fixtures as well as a volumetric component, to be a reasonable reflection of costs and therefore appropriate.

4.4 Residential Wastewater Charges

4.4.1 Background

Residential wastewater tariffs in Western Australia are currently set as a fixed charge each year, based on the estimated Gross Rental Value (**GRV**) of the property. As relative property values vary, the wastewater charges are adjusted to maintain the required amount of revenue for the wastewater service. In Perth, residential wastewater charges are set to recover the cost of the service (by assuming that the cost share between residential and commercial customers is maintained at its existing level).

In the country, residential wastewater charges are set to recover the costs of wastewater service provision in each scheme and are subject to minimum and maximum charges. For very high cost towns, full cost recovery is limited by the application of a cap of $0.12 per dollar, which limits the extent of full cost recovery in these areas. [30] There is also a maximum and minimum on the total service charge payable by any individual country customer (there is currently no maximum charge for metropolitan customers). The minimum country residential wastewater charge in 2009/10 is $287.50 per residential unit and the maximum charge is $716.40.

South Australia, some parts of Tasmania, and WA are the only jurisdictions in Australia that charge for residential wastewater services on the basis of property values. Most other jurisdictions apply fixed uniform wastewater service charges for residential customers. Melbourne is an exception where, in addition to the uniform fixed service charge, residential customers pay a sewage disposal charge based on estimated sewage disposal volumes.[31]

In the 2005 Inquiry on Urban Water and Wastewater Pricing, the Authority recommended a transition away from GRV-based prices to a four block inclining annual fixed charge. However, the Government did not accept this recommendation.

4.4.2 Assessment

General issues with GRV-based pricing

There are a number of arguments for decoupling residential wastewater charges from property values.

- Under property-based pricing, there is little if any relationship between the price charged and the cost of the service. Customers are unable to see any link between what they pay for their wastewater service and what it costs to provide that service.
- The Authority is not aware of reliable evidence to support the view that there is a strong correlation between property values and income.[32] The Authority noted in

[30] *Water Agencies (Charges) By-laws 1987*, Schedule 3 – Charges for sewerage for 2005/06, Division 2(10). The By-laws set out the minimum and maximum country sewerage charges for residential land, vacant land and other land; and, for each country sewerage area, the dollar rate per GRV for residential and non-residential land, with a maximum rate of $0.12 per dollar of GRV. The *Water Agencies (Powers) Act 1984* limits the maximum rate than can be applied in By-laws to $0.20 per dollar of GRV.

[31] Sewage disposal volumes are estimated on the basis of winter water consumption volumes and estimated discharge rates to the sewerage system. Estimated discharge rates are higher for flats than for houses, and higher in winter than in summer.

[32] The available evidence on the relationship between income and property values in Western Australia is very limited. In fact, there appear to be few studies of this issue generally. A recent review of the

its 2005 Inquiry into Urban Water and Wastewater Pricing that 25 per cent of lower-income households are in above-average valued properties. This raises significant questions over using property value as a simple measure of capacity to pay. In addition, the Water Corporation notes in its submission that:

> Traditionally, property valuation was used as a proxy for income or affordability. While there is truth to this assumption, the correlation continues to weaken as Perth ages. Older, more centralised neighbourhoods continue to increase in property values, increases which may not be matched by proportionate increases in the income of existing residents. (Water Corporation, submission on Issues Paper, p42)

- As submitted by the Water Corporation, there are administrative costs associated with property value-based pricing, largely arising from the need to manage customer responses to changes in property valuations and wastewater charges. An alternative less complex system of wastewater charges would result in some administrative savings.
- If a State-based access regime were to be introduced, with access prices set at the retail price less any avoidable costs, the presence of property-based wastewater charges would add unnecessary complexity to the access regime. Where wastewater charges vary on the basis of property values, the access payment made by the access seeker to the Water Corporation would vary depending on the customers that were being served by the access seeker.[33]
- A move away from GRV-based wastewater charges was supported in submissions to the inquiry by the Water Corporation, Department of Treasury and Finance and Department of Water. However, WACOSS opposed any move away from GRV-based pricing due to the potential for increases to low income households and tenants.

Particular issues in the country from GRV-based pricing

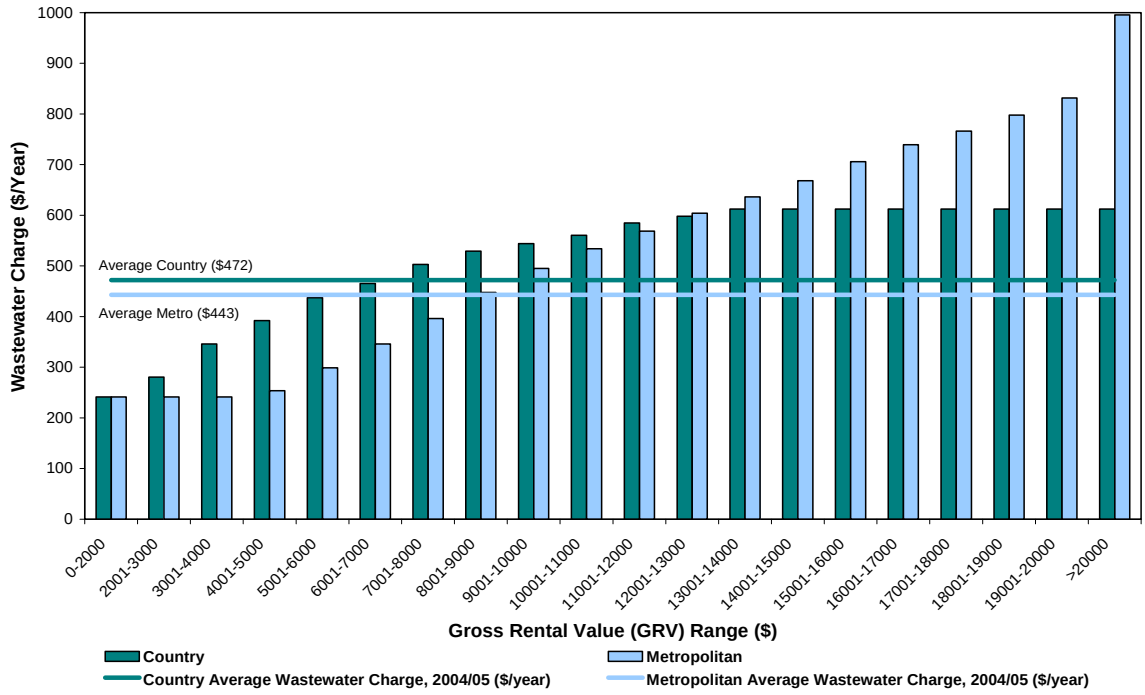
In addition to the problems outlined above, the application of the GRV-based approach to wastewater charging in the country has resulted in some particular issues.

Comparison between residential wastewater tariffs in Perth and in country areas (Figure 4.1) shows that, in the lower-GRV brackets, wastewater tariffs are higher for country customers than for Perth customers in the same GRV band. This is partly due to the cap on individual wastewater charges in country towns, which does not apply in Perth, and which results in a greater proportion of wastewater costs being borne by low-GRV households in country towns, relative to households with the same GRVs in Perth.

correlation between income and home values undertaken for the Local Government Association of South Australia does not support the idea of a strong correlation. Indeed they find that the simple correlation is weak, both for Australia and Adelaide. South Australian Centre for Economic Studies. (2004). "The Correlation Between Income and Home Values: Literature Review and Investigation of Data." SA Local Government Association.

[33] However, the access seekers decision to enter the market would still be efficient as the retail price it pays would be recovered from its retail customers (less an amount to encourage switching); entry occurs only if savings in avoidable costs can be achieved.

Figure 4.1 Estimated Average Annual Wastewater Charges (2006) Versus GRV for Country and Metropolitan Residential Customers



Source: Water Corporation, with ERA analysis

The effect of the cap is to shift the cost burden from customers in high-GRV properties towards customers in low-GRV properties. Thus, the income redistribution effect of GRV-based pricing is less pronounced in country towns than in the Perth metropolitan area.

This situation illustrates the principal difficulty in using GRV as a basis for charging. GRV is influenced by a complex combination of market forces and policies. Hence, making it a basis for charging for a service such as wastewater is always likely to produce unintended consequences in terms of efficiency and equity.

Alternatives to GRV-based pricing

The Authority in its Draft Report recommended the measurement of winter water usage (a good proxy for wastewater discharge) as the most cost reflective price structure for residential wastewater services. Winter water usage is likely to be highly correlated with the volume of wastewater discharge, and would take into account differences between properties in the number, ages and lifestyles of occupants.

However, the Water Corporation and other submissions noted difficulties with implementing a charge based on winter water usage.[34] Measuring household winter water usage would require more frequent metering, aligned to the rainy season. Adjustments would also be needed to take into account factors such as variation in the timing of the rainy season across the state, seasonal tourism in some towns, changes in tenancy, and for information transfers between the water service provider and wastewater service provider where these differ.

[34] See submissions on Draft Report by the Water Corporation, Part B, p16-18; WALGA, p1-2; Department of Treasury and Finance, p10; Department of Water, p5.

The Water Corporation submitted that a fixed service charge would be simpler to implement, reasonably cost reflective and would be perceived as fair by customers. A flat charge was also supported by the Department of Treasury and Finance.

The Authority accepts that a flat charge across all residential properties is likely to be more cost reflective than prices based on property values. Given the technical and administrative considerations in implementing charges based on winter water usage, the Authority therefore recommends that a flat charge be adopted.

However, it is understood that the Water Corporation is considering increasing its billing frequency to quarterly. This could facilitate a move to wastewater charging on the basis of winter water usage, and it would be worth further investigating whether such an adaptation to the charges would be warranted in terms of improved cost reflectivity.

Transitional Issues

Any move away from GRV-based pricing would result in households with low valued properties facing higher wastewater charges (on average) while households with high valued properties would pay less (on average).

The Authority has analysed the impacts if households in Perth were transitioned to a flat charge.

Figure 4.2 illustrates the impacts on households in Perth of moving to a flat wastewater charge immediately. The dotted horizontal line shows the average charge is $543. The two inclining lines show the range of charges that applied within each band of GRV in 2008/09. For example, if a household had a GRV within the range $7,001 to $8,000 the charge was between $332 and $389 per year. The columns in the figure show the percentage of households within that GRV band (for example, 7 per cent of households have a GRV between $7,001 and $8,000).

If the flat charge were to be implemented immediately, households with a GRV below approximately $11,000 would have an increase in their bills while those above this GRV would have a decrease in their bills. Approximately half of customers would face an increase while the other half would face a decrease in their bills.

Figure 4.2 Impact on Perth Households of Moving to a Flat Wastewater Charge Immediately (Real Dollars of June 2009)

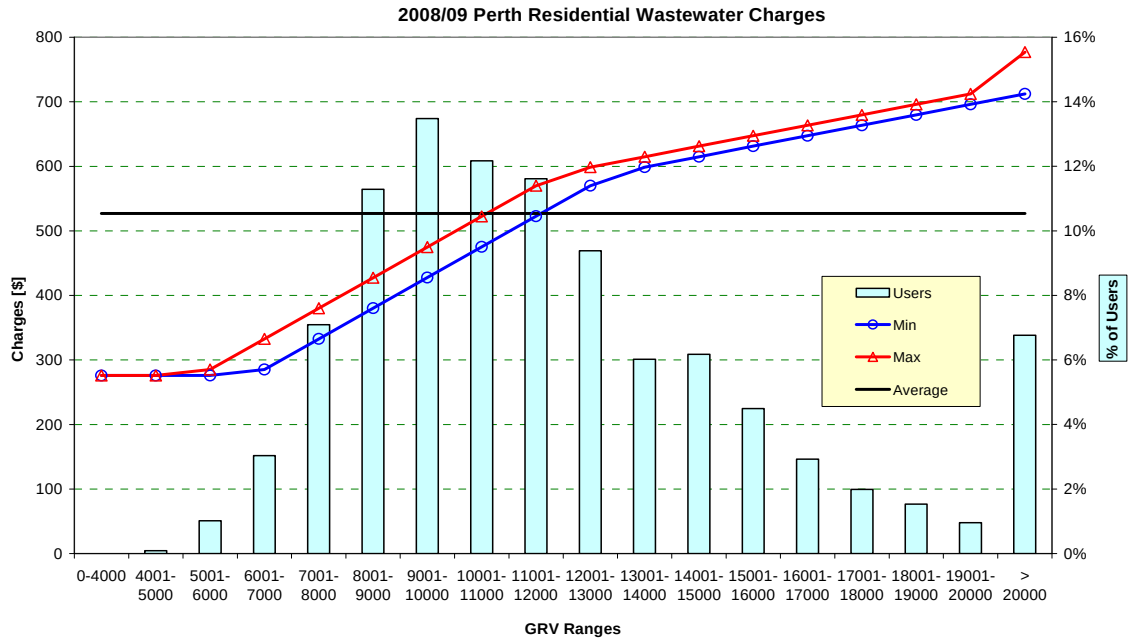
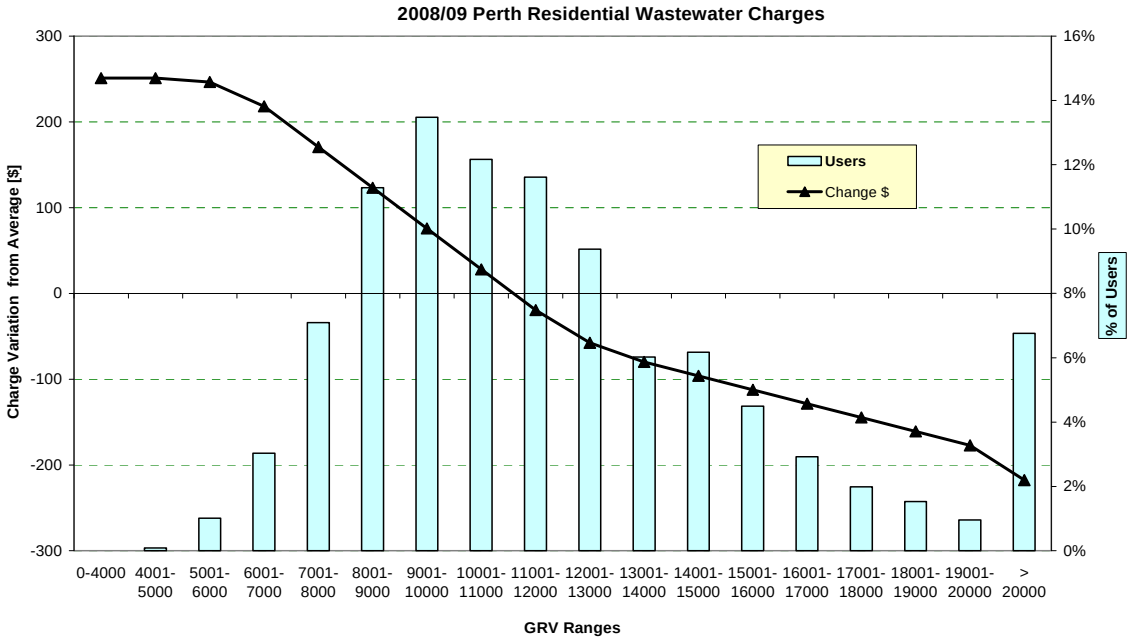


Figure 4.3 shows that the payment variation associated with moving to a flat charge would range from an increase of $251 to a decrease of over $200.

Figure 4.3 Financial Impact of Moving Immediately to a Flat Wastewater Charge by Distribution of Perth Household Wastewater Charges (Real Dollars of June 2009)



The potential for price increases to low income households in moving away from GRV-based charges was of concern to WACOSS, which recommended that:

> …residential wastewater pricing based on GRV continue, until further investigation of alternate measures has taken place, considering financial impacts on low income consumers, in particular tenants, which make up almost 25% of the population. (WACOSS submission on Draft Report, p10).

In order to reduce the annual impacts on customers, the Authority recommends that wastewater charges be transitioned to a flat charge over a three year period. The annual impacts associated with the transition over the regulatory period would be approximately one third of the impacts shown in Figure 4.3.

Several submissions to the inquiry acknowledged the transitional issues, particularly on customers in low GRV properties, of moving away from property-based prices and supported a transition period (Water Corporation, Department of Treasury and Finance).

In addition to the financial impacts associated with a transition to a flat charge, residential customers in Perth would pay an additional $30 between 2009/10 and 2012/13 (or an additional $10 per year) as a result of higher wastewater costs.

Conclusion

Overall, the Authority favours a flat wastewater charge based on the average annual cost of service. This approach would be more cost reflective than property based prices and would be relatively simple to implement and administer. A transition period of three years is recommended to minimise financial impacts on customers.

4.5 Non-Residential Wastewater Charges

4.5.1 Background

Non-residential wastewater charges are the same for commercial customers in Perth and in the country and consist of a service charge and a usage charge. The service charge is based on the number of major sewerage fixtures. The usage charge is based on the estimated volume discharged to the sewerage system, which is calculated on the basis of water usage multiplied by a discharge factor.

Other jurisdictions around Australia also use the number of fixtures to determine service or usage charges. Table 4.1 summarises approaches used by other water utilities.

Table 4.1 Non-Residential Wastewater Charging Methodologies in Other Jurisdictions

Wastewater Service Provider	Charging Approach for Non-Residential Wastewater Customers
Victorian water businesses	Generally two-part tariffs, with service charges (where these are used) based on the number of cisterns and usage charges based on estimated discharge to the sewers.
Sydney Water	Service charge based on water meter size, and a usage charge based on estimated volume discharged to the sewers. There are no usage charges for the first 500 kL of discharge.
ACTEW (Canberra)	Fixed sewerage charge, based on the land classification of the property and the number of cisterns.
Brisbane Water	Fixed service charge and a charge based on the number of cisterns.

Source: ERA

4.5.2 Assessment

The Authority called for comments during the inquiry as to whether the current tariff structures for non-residential wastewater services are reflective of the costs of service, or whether other approaches might be better (for example, basing the service charge on estimated water usage or water meter size rather than the number of fixtures).

The Water Corporation and the Department of Treasury and Finance supported the current approach to non-residential wastewater charges, on the basis that it is reasonably cost reflective:

> **Water Corporation**
>
> Non-residential wastewater customers potentially pay three charges for wastewater services, to reflect:
>
> 3) The benefit of having a wastewater service available (fixed annual service charge);
> 4) The quantity discharged into the wastewater system (volumetric charge); and
> 5) The quality of discharge in the wastewater system (industrial waste charges).
>
> Collectively, these charges represent a robust approach to cost reflective pricing. They were initially introduced in the metropolitan region in 1995 and subsequently applied to the country region in 2003. In both instances, the approach was reviewed and determined that on balance, the charges are as good as any alternative available options.
>
> The Corporation is not aware of any customer pressure to adopt an alternative charging methodology. (Water Corporation submission on Issues Paper, p43)
>
> **Department of Treasury and Finance**
>
> The basis for calculating non-residential volumetric wastewater charges is widely practised in other jurisdictions and broadly considered to closely reflect the cost of service delivery. The continued use of a service charge (based on the number of sewage fixtures) and a usage charge (based on water usage multiplied by a discharge factor) is considered appropriate. A volumetric component in wastewater charges for commercial customers appears more appropriate [than for residential customers] because business and industry have greater incentives to reduce water and wastewater charges. (Department of Treasury and Finance submission on Draft Report, p12)

The Authority did not receive any indication that an alternative measure (such as meter size) would provide a more cost-reflective basis for setting the wastewater service charge to commercial customers than the number of fixtures. It is also appropriate for wastewater tariffs to commercial customers to include a volumetric component. This can provide an incentive for customers to invest in technologies to reduce wastewater discharges.

The Authority therefore considers that the current method of charging non-residential customers for wastewater services is appropriate.

The Authority also considered whether commercial wastewater tariffs should be calculated on a scheme-by-scheme basis, rather than calculated only for Perth and then uniformly applied to all country towns, and concluded that there is merit in setting separate charges for each scheme. This issue is discussed in section 11.5.2.

In addition, as will be discussed in section 6.4.2, there is currently a cross-subsidy between standard non-residential wastewater customers and non-residential wastewater customers receiving a discount. The removal of the cross-subsidy, and replacement with a CSO, would result in lower tariffs for standard non-residential customers.

5 Drainage Charges

5.1 Terms of Reference

This section contributes to addressing the following Terms of Reference:

> the Authority is to investigate and report on …
>
> - the appropriate charging structures and recommended tariff levels for the Water Corporation's drainage services;

5.2 Recommendations

Recommendations

9) Developers be charged the costs of any drainage infrastructure that is required to service developments (with the developer charge based on the average costs to the Water Corporation of expanding the drainage network over the last 10 years).

10) Residential and commercial customers (within the main drainage system provided by the Water Corporation) in Perth be charged the residual costs of drainage that remain after the costs attributed to developers have been deducted.

11) Customers within the Water Corporation's main drainage system in Perth be charged for drainage on the basis of land area.

    a) All residential customers, plus non-residential drainage customers with land area less than 1,000 square meters, be charged $87.21 per year.

    b) Non-residential drainage customers with land area from 1,000 square meters to 10,000 square meters be charged $436.04 per year.

    c) Non-residential drainage customers with land area above 10,000 square meters be charged $872.07 per year.

12) The proposed drainage charges be introduced in 2010/11 and then be held constant in real terms.

13) In future, any expenditure on drainage quality be recovered through a levy on all of the Water Corporation's water customers in the scheme.

14) The costs incurred by the Water Corporation in providing drainage services in the six rural drainage districts be passed on to local councils in a cost reflective manner.

5.3 Reasons

There are significant public benefits associated with drainage: it is the community at large that often benefits and in most cases it is difficult to justify, on efficiency grounds, charging one resident more than another.[35] For example, everyone benefits at some time from the drainage for recreational parks and roads (e.g. from preventing flooding or water-borne diseases). However, there are instances where the benefits are more private in nature and the expenditure would not be incurred were it not for the benefit it provides to one particular group. For example, the residents of new developments are the primary beneficiaries of the drainage infrastructure required in those developments.

[35] Technically, it would not be practical to exclude any one individual from benefiting from drainage, and the benefits that any one resident receives do not diminish the benefits that others receive.

The Authority does not consider that the current charging approach is fair or cost-reflective. Charges to the Water Corporation's customers are based on property values, with non-residential customers paying an amount that is disproportionate to their benefit. While two thirds of residential customers pay the same minimum fixed charge, the other one third pay much higher amounts based on their property value.

The Authority considers that a fairer and more cost-reflective approach is to charge developers the costs of expanding the drainage network and then recover the remaining costs from the Water Corporation's customers who occupy the main drainage area in Perth. Those remaining costs would be allocated to residential and non-residential customers on the basis of land area. Residential customers would be charged a flat charge while non-residential customers would be charged, on the basis of land area, in three tiers.

In future, it would be fairer if all Perth residents (both Water Corporation and local government drainage customers) were to share the costs of the drainage systems that provide public benefits, such as expenditure on improving drainage quality. One approach for recovering the public benefits associated with drainage would be to have a drainage levy that applies to all Water Corporation water customers in Perth (and would be itemised separately on the water bill). The proceeds from this levy could be used to fund all public benefit-related drainage expenditure by drainage service providers. However, as the Water Corporation has not proposed expenditure on improving drainage quality, this approach has not been recommended for the coming regulatory period.

5.4 Background

In the Perth metropolitan area, the Water Corporation provides the main drainage services across 40 per cent of the Perth metropolitan area. The Water Corporation owns and manages a system of around 830 kilometres of main drains (generally piped drains larger than 700 mm diameter, as well as open channels). Other infrastructure includes compensating basins and gauging stations to measure flows and rainfall. Main drains which cross more than one local area boundary are provided and maintained by the Water Corporation, if requested by local authorities. There are around 325,000 homes and businesses connected to the Water Corporation's drainage network. Water that goes into drains ends up in either rivers, wetlands or the ocean. Under its licence, the Water Corporation is required to provide drainage services in the metropolitan area to accommodate a one-in-five year rainfall event in residential areas, and a one-in-ten year rainfall event for commercial areas and compensating basins.[36]

Local councils own and maintain the local drainage infrastructure over the remainder of the metropolitan area (around 3,000 kilometres of local drains, generally with pipes less than 700 mm). Local governments providing drainage services recover their costs from council rates and specific drainage charges, which are not regulated.

The current funding arrangements for the Water Corporation's drainage system are:

- 40 per cent of the total capital cost of drainage is recovered through the standard headwork charges;

[36] Water Corporation's operating licence requires the urban drainage scheme to be protected against flooding from peak flows of stormwater runoff from rainfall events with intensities up to a 5 year average recurrence interval (residential) and a 10 year average recurrence interval (commercial). For example, a 5 year average recurrence interval can be interpreted as "rainfall of a given amount falling within a given period will be exceeded, on average, once every five years." The rainfall event is defined on the basis of rainfall

- the remaining capital costs (i.e. 60 per cent) plus operating costs are recouped via annual charges by Water Corporation to its customers in the main drainage area of Perth; and
- country drainages systems are funded by a CSO.

The Water Corporation recovers its costs from metropolitan customers through drainage charges based on GRV; see Appendix C and Appendix D for the current charges. In addition, the Water Corporation also provides drainage services in a number of country areas. However, the costs of these services are currently met through a CSO, so country customers do not pay for drainage.

For new developments, the developers provide smaller pipes, as well as landscaping of developments to minimise additional runoff and inflows into the main drains. In addition, developers pay a headworks charge.

To date, the Authority has not been involved in determining whether the rates per dollar of GRV applied by the Water Corporation for drainage are appropriate (i.e. set to recover the efficient costs of drainage service provision). Note that the water boards do not provide drainage services.

The funding of drainage services in Western Australia is currently being reviewed by the Department of Water.[37] It is understood that this review will involve consideration of governance and institutional arrangements, the roles of service providers, service standards, the level of required funding and funding mechanisms.

In considering issues on drainage tariffs, the Authority engaged ACIL Tasman to provide advice. A copy of their report is available on the Authority's web site.

5.5 Assessment

In developing its recommendations, the Authority considered the allocation of costs:

- to public beneficiaries;
- between residential and non-residential customers within the main drainage area; and
- to country customers.

In addition, the Authority considered the impacts on customers of alternative charging methods.

5.5.1 Allocation of Costs to Public Beneficiaries via a Drainage Levy

Drainage systems provide a range of benefits, both public and private.

- Public benefits include improved water quality, reduced flood damage to public facilities, reduced incidence of waterborne disease resulting from flooding by contaminated water, increased recreation opportunities and an improved aesthetic environment.
- Private benefits include reduced flood damage to private facilities, land value enhancement, and increased property values.

[37] http://portal.water.wa.gov.au/portal/page/portal/WaterManagement/Stormwater

The public benefits associated with drainage in Perth are spread over the entire Perth population. At present, Water Corporation's customers in Perth pay for the public benefits associated with the Water Corporation's expenditure on drainage. Local government ratepayers in the areas outside of the Water Corporation's main drainage area pay for the public benefits associated with the local government expenditure on drainage.

The Authority considers that it would be fairer if all Perth residents (including both Water Corporation and local government drainage customers) were to share the costs of the drainage systems that provide public benefits. One approach for recovering the public benefits associated with drainage would be to have a drainage levy that applies to all Water Corporation water customers in Perth (and would be itemised separately on the water bill). The proceeds from this levy could be used to fund all public benefit-related drainage expenditure by drainage service providers.

A further matter for this inquiry is whether additional obligations should be imposed on drainage service providers to improve the quality of drainage and stormwater, and if so, how these obligations should be funded.

Water Corporation has indicated that it has considered adding (from 2012/13) approximately $40 million per year (in real dollar values of 2008) to its capital expenditure programme to improve drainage quality. If this expenditure were incurred, it may be appropriate to recover the expenditure by applying a drainage levy to all water customers in Perth. The Authority has calculated that a levy of approximately $12 per water customer per year would be required to pay for this indicative drainage quality program.[38]

The Authority has not proposed recovering any of the Water Corporation's drainage costs from the wider Perth population (through, for example, a drainage levy), but considers that this matter should be assessed at the next regulatory review, particularly if the Water Corporation proposes significant additional capital expenditure on improving drainage quality.

The introduction of a drainage levy was widely supported by submissions to the inquiry.[39] The Water Corporation, while supporting the drainage levy, noted that:

> 6) The Corporation's potential drainage water quality charges should only reflect the cost of expenses incurred by the Corporation. The charge should not (and under the current legislation, cannot) be a mechanism by which the Corporation recovers the cost of drainage water quality expenditure incurred by other organisations;
>
> 7) The Corporation's 10 year capital program (2008/09 to 2017/18) included provision for expenditure on drainage water quality in the last 5 years of the forecast. This was a general provision for potential projects. As part of the 2009/10 budget process (and forward estimates) recently completed, this provision has since been removed until such time as the State's direction on drainage water quality has been established and the extent to which the Corporation plays a part in this direction is known. (Water Corporation submission on Draft Report, p19)

The Swan River Trust, WA Local Government Association (**WALGA**) and Department of Water noted the urgency of expenditure to improve drainage water quality in the Perth region.

The WA Local Government Association noted that much of the work to improve drainage quality is carried out upstream by local governments and submitted that as these

[38] This assumes the payment would commence in 2013/14 (the start of the next regulatory period).

[39] Submissions on Draft Report – Water Corporation, Part B, p19; Department of Water, p6, Swan River Trust, p1-2; Department of Treasury and Finance, p14.

improvements benefit the wider community, the costs would be better recovered from the wider community (WA Local Governments Association, submission on Draft Report, p2-3). The Department of Water also noted that the issue of how local government drainage costs are recovered needs further consideration.

5.5.2 Allocation of Costs to Developers

In the case of developers, the Authority considers that it would be appropriate for developers to pay for the costs associated with expanding the drainage network because the benefits mainly stay with customers in the newly developed areas. Residential and commercial customers within the main drainage system provided by the Water Corporation in Perth should be charged any costs that remain after the costs attributed to developers have been deducted.

In the Draft Report, the Authority proposed that developers be charged the average cost per lot developed over the last ten years ($660). This cost was considered to be most representative of the average cost of expanding the urban drainage infrastructure.

This recommendation, and the recommendation that the remainder of drainage network costs be recovered from residential customers within the main drainage system, was supported by the Water Corporation and other submissions (Swan River Trust, WA Local Government Association, Department of Treasury and Finance).

5.5.3 Allocation of Costs Between Residential and Non-Residential Customers

Currently, drainage charges are set on the basis of GRV. A different rate in the dollar is applied to residential land (0.501 cents), vacant land (0.400 cents), and non-residential land (0.603 cents). The minimum charge to all groups of customers is $63.10 per year. In addition, the fixed annual charges that apply to strata-titled caravan bays and parking bays are $18.95 and $7.80 respectively.

Analysis by the Water Corporation using 2004/05 data indicates that 75 per cent of residential customers pay the minimum annual charge. There is, therefore, minimal benefit in applying the GRV approach, as in effect the charging is largely on the basis of a fixed charge. The comparative figure for non-residential customers is 14 per cent.

There is no economic rationale for using GRV as a basis of charging as it is not cost reflective. In addition, it results in a significant level of cross-subsidy from non-residential customers to residential customers, with some non-residential customers paying up to $250,000 per year.

There was widespread support in submissions for moving away from GRV-based pricing for drainage services (Water Corporation, Department of Water, Swan River Trust, WA Local Government Association, Department of Treasury and Finance).

In developing an alternative to GRV-based pricing, the Water Corporation proposed using land area as the method for charging non-residential customers and a flat charge for residential customers.

The Authority considers that the Water Corporation's proposal had merit, and recommends the following annual charges, to be introduced in 2010/11 and held constant in real terms:

- $87.21 for all residential customers, and non-residential drainage customers with land area less than 1,000 square metres;
- $436.04 for non-residential drainage customers with land area between 1,000 to 10,000 square metres; and
- $872.07 for non-residential drainage customers with land area greater than 10,000 square metres.

This approach was supported by the Water Corporation. The Department of Treasury and Finance also supported the charges, but submitted that a land area-based charge for non-residential customers is not cost-reflective.

> While the ERA recommends a flat charge for residential customers (with land under 1,000 square metres), it has recommended that non-residential customers be charged on the basis of land area, in three tiers. These tiers appear to be more equitable but bear no relation to cost-reflectivity. However, on the basis of the equitable distribution of drainage costs, these charges are more appropriate for non-residential customers than the flat charge. (Department of Treasury and Finance submission on draft report, p14)

The Authority accepts that there may be other approaches to setting drainage charges for non-residential customers that are more cost-reflective than land area-based charges. However, the proposed charging structure is more cost reflective than GRV-based charges, and represents a reasonable transition from GRV-based charges.

The Department of Treasury and Finance also proposed that any pricing reforms be delayed until after the review of drainage funding by the Department of Water is completed. However, the Authority does not consider that a more cost reflective approach to recovering the Water Corporation's charges need be delayed until a wider review of drainage funding is undertaken.

WALGA noted that most local governments set drainage charges based on the current approach used by the Water Corporation (based on GRV with a minimum charge). WALGA supported the concept of a flat charge for residential customers, but did not support a land area-based charge for non-residential customers because of concerns that such a charge could be difficult for local governments to implement.

> Local Governments would generally not be opposed to a flat (per property) charge for residential drainage services.
>
> The costs and risks associated with maintaining a separate, up to date land area based charging system for non-residential property requires detailed consideration and is currently not supported by Local Governments.
>
> (WA Local Government Association, submission on draft report, p3)

However, the Authority notes that its recommendations apply only to the recovery of Water Corporation's drainage costs, rather than the costs incurred by local governments. The basis by which local governments recover their drainage funding is a matter for local governments and need not reflect the approach adopted by the Water Corporation.

5.5.4 Impacts on Customers of Alternative Charging Methods

The Authority examined the impacts on customers of its recommended charging approach.

At present, the average residential metropolitan drainage charge is $65.69, with 75 per cent of residential customers paying the minimum charge of $63.10.

Under the recommended charging approach, all of Water Corporation's residential drainage customers would pay a drainage charge of $87.21. The majority of Water Corporation residential customers would face an increase in their bills of approximately $24 per year. The remaining Water Corporation customers, with relatively high GRV properties, would generally receive a reduction in their drainage bills.

The financial impacts on non-residential metropolitan customers from moving to an area-based drainage charge would depend on their current GRV and land area.

- Particularly significant payment reductions would be expected for very high GRV/low land area customers, such as property owners in the central business district, which would see charges being reduced from as much as $250,000 per year to less than $100 per year.
- The median customer within the top 10 per cent of customers by GRV, if they had a low land area, would see their charge being reduced from $1,309 per year to less than $100 per year.
- High GRV/medium to high land area customers, such as shopping centres would see their charges being reduced from an average of $20,000 per year to less than $450.
- Low GRV/high land area customers, such as nurseries and market gardens would see their drainage charges being increased to $872 per year. Currently, nurseries and market gardens pay between $67 per year and $752 per year (and $203 per year on average).
- It may be noted that the average non-residential customer by GRV currently pays $450 per year.

Some flexibility in charging may be required to provide for high land area customers who do not have a significant drainage requirement to be charged at a lower drainage rate.

There may be a claim by market gardeners and other low GRV/high land area customers without significant drainage requirements that the recommended drainage charge is too high.

5.5.5 Allocation of Costs to Country Customers

In relation to country drainage services, the pricing issue for this inquiry is whether country customers should pay for drainage services provided by the Corporation. The Water Corporation currently provides rural drainage services in six rural drainage districts (Harvey, Roelands, Busselton, Mundijong, Waroona and Albany), which are proclaimed under the *Land Drainage Act 1925*. The costs of these services are met through CSOs (around $10 million for 2008/09).

Background

There are two types of rural drainage services provided by the Water Corporation:

1) operation and maintenance of main rural drains; and
2) flood protection.

Service standards for both services are set out in Water Corporation's operating licence. Service standards for rural drain operation and maintenance differ from the service standards for flood protection.

- For rural drain operation and maintenance, Water Corporation operates to a "three-day rule" – drains are maintained so that they are capable of clearing water from adjacent properties within three days of a rainfall event. This corresponds approximately to a 2-5 year average recurrent interval flooding.
- Some particular areas are protected from flooding through additional flood protection works (e.g. levees, diversions, drains or floodgates). These works are required under the operating licence to cater for rainfall events ranging from 1 in 25 years to 1 in 100 years.

There are several issues emerging in the provision of country drainage services.

- Increased development, rural sub-division and changing land-use patterns in the south west have increased customer expectations of rural drainage services. Drainage in urban communities and rural sub-divisions is the responsibility of local authorities, which aim to mitigate the risk of flooding. Some new communities discharge into rural drainage systems, which are not designed to deal with additional volumes. In order for Water Corporation to meet its service standards for rural drains (the "three day rule"), developers are required to ensure that the flows into the Water Corporation's rural drainage network do not exceed pre-development flows. This outcome is achieved through measures such as installing compensating basis in new developments.
- The Department of Water is developing a Coastal Drainage Framework (a draft report is being finalised). This framework could increase the obligations on the Water Corporation to improve or provide flood protection in some areas and to take measures in some areas to improve the quality of water discharging from the drainage networks into the environment. This would add to the costs of providing country drainage services.
    - At the moment, there is no requirement on the Corporation to undertake any measures to deal with the quality of drainage water, only quantity. However, the Corporation does undertake some work as part of its own corporate initiatives. Improvement of drainage water quality focuses on measures and practices which affect the quality of water entering the drainage system (such as the type and amount of fertilisers used by farmers, which add to nutrient levels of drainage water) and ultimately the quality of natural water bodies.

Charging Approach for Rural Drainage Services

Currently, the costs of the Water Corporation's rural drainage services are covered by CSO payments from Government. In the past, charges were made on the basis of indirect drainage charges for each drainage district and direct drainage charges for those receiving drainage services on their land. However, drainage rates for the drainage districts were abolished from 1 July 1993.

The beneficiaries of country drainage services are primarily the residents of the drainage districts (e.g. flood protection; environmental protection and improvement). There are some wider community benefits, to the extent that those outside the districts benefit, directly or indirectly, from the protection of the environment in the districts. However, these benefits are likely to be small compared with the benefits to the local communities.

In most rural communities, drainage services are provided by local councils and the costs recovered from ratepayers. It is therefore inequitable for the drainage costs in the six drainage districts serviced by the Water Corporation be funded by general tax payers. The Authority therefore recommends that the costs incurred by the Corporation in providing rural drainage services be passed on to the local councils, in a manner that reflects the costs incurred in each area. It would then be a matter for those councils to recover the costs from their ratepayers.

The costs of providing drainage services could vary across districts, for example, depending on which areas are subject to greater development pressures. This could result in different charges for each district, which would be cost-reflective. If the Corporation is required to increase expenditure on rural drainage services to meet higher environmental quality standards, then these costs would also be passed on to local councils, and could vary by area, depending on the nature and location of the expenditure.

It should be noted that many of the costs arising from increased drainage requirements for new developments are borne by developers (through the design and measures in new developments to maintain pre-development flows) and ultimately passed on to the buyers of properties in those developments. Thus, these drainage costs are recovered on a “user pays” basis.

6 Water Corporation's Other Tariffs

6.1 Terms of Reference

This section contributes to addressing the following issue referred to in the Terms of Reference:

- the appropriate charging structures and recommended tariffs for the Water Corporation's other regulated services.

6.2 Recommendation

Recommendations

15) Where practical, charges for minor tariffs associated with water, wastewater and drainage services should reflect the efficient costs of service.

16) Non-standard charges associated with metropolitan standpipes, industrial waste discharge to sewers, and specific services relating to industrial waste are set in a way that reflects costs and are therefore appropriate.

17) Additional charges (or discounts) on delayed (or early) payments reflect the costs to Water Corporation of delayed payment. However, the Authority recommends that the penalty rate on overdue accounts be reduced from 13.99 per cent to no higher than 1 per cent above the nominal cost of debt in the weighted average cost of capital calculation, to reflect more closely the cost of debt.

18) Subsidies to public and charitable institutions for water and wastewater services be either funded by a CSO or discontinued, rather than paid for by other customers. For the purpose of this report, it has been assumed that these subsidies are funded by a CSO.

19) Residential caravan bays be charged the standard residential fixed charges for water and wastewater services.

20) Water usage charges for farmland, local government standpipes and stock watering be set cost reflectively, and include a quota for residential use set at residential prices, with commercial pricing for usage above the quota.

21) Small mining customers be charged for water usage at the country non-residential tariffs.

22) Wastewater charges for non-residential vacant land be based on a fixed charge, and the additional GRV-based component removed.

6.3 Reasons

The Water Corporation's minor tariffs associated with water, wastewater and drainage services should be set as cost reflectively as possible. In some cases, exemptions and concessions on charges have been put in place due to equity and/or political reasons. Where equity concerns remain, subsidies would be better delivered through other mechanisms, such as direct grants, rather than through tariffs. In some circumstances it is other customers that fund the subsidy. If the Government wishes the subsidy to continue the Authority considers that the subsidy should be funded by a CSO.

Other variations to standard charges exist for practical reasons. In these cases, the administrative costs involved in improving the cost reflectivity of these charges would be too high. As such, the Authority does not recommend any change to these standard charges.

In some cases, non-standard tariffs reflect the different costs involved in delivering particular services. The Authority considers that charges applied by the Corporation to metropolitan standpipes, industrial waste discharge to sewers and industrial waste services to be reasonably cost-reflective. However, penalty charges applied by the Corporation to overdue payments appear higher than reasonable, when compared to the cost of debt.

6.4 Background

The Water Corporation has a range of charges which vary from the standard charges in their respective category. The reasons for these non-standard charges are varied, including adjustments to reflect specific costs of service, equity and political considerations, administrative cost and practicality.

The full range of non-standard charges is outlined and discussed in Appendix D.

The Authority engaged Economic Research Associates to review the Water Corporation's non-standard regulated tariffs and charges. The report is available on the Authority's web site.

6.4.1 Variations Due to Costs of Service

Some variations from standard charges are aimed at reflecting the costs of particular services. The setting of charges to reflect the costs of specific services is economically efficient – users pay the full costs of the services they receive. The Authority has examined the cost reflectivity of a range of the Corporation's non-standard charges (see the note by Economic Research Associates on the Authority's web site).

1) Metropolitan Standpipes

Standpipes are used mainly for dust suppression during construction works. Water usage rates are set at the highest non-residential unit price ($1.043 per kL). This price is effectively an opportunity cost price and can be considered cost reflective to the extent that non-residential tariffs are cost reflective.

2) Industrial Waste Discharge to Sewers

The disposal of waste to Water Corporation sewers is subject to a variety of regulations, set by the Department of Environment and Protection and the Water Corporation. Industrial waste discharged to Water Corporation's sewers (in accordance with major waste permit) is charged:

- a uniform state-wide volume charge ($1.10 per kL); and
- an additional charge which varies by the type and load of contaminant.

Charges are based (following consultant advice) on the costs that each type of industrial waste imposes on the sewerage system, in terms of monitoring, transport, treatment, volume and impacts on system operation. The charges are broken down into transport, treatment by type of waste and volume. Businesses can request specific costings be carried out and pay these costs rather than the standard unit rates.

The Authority considers that the approach taken to setting charges for the discharge of industrial waste to the Corporation's sewers is based on the marginal costs imposed on

the system. The charges appear to be cost reflective and are therefore considered appropriate.

3) Industrial Waste Service Charges

There are a range of specific services associated with industrial waste which are provided by the Water Corporation, such as issuing permits, meter reading, inspections, production evaluation, sampling, and the management of fasts, oils and grease. Each of these services has a charge (e.g. the fee for a permit is $187.70; the fee for a meter reading is $21.20).

Charges for each service are based on an average time costs (based on cost records and average situations) for each activity. Atypical services involving more complex services would be costed specifically on the basis of actual time spent on the service.

The Authority finds that these charges appear to be cost-reflective and are therefore considered to be appropriate.

4) Discounts and Additional Charges

The Water Corporation offers discounts for early payment of accounts and applies additional charges for instalment arrangements where payments are delayed. The rationale for these charges is that they reflect the costs that are saved (or incurred) by the Corporation due to early (or delayed) payment of accounts. The charges are set on the basis that the present value of each payment method is the same.

The Corporation also charges a penalty rate of 13.99 per cent on overdue payments that are not subject to an agreed instalment arrangement. The Authority is of the view that this rate is higher than is reasonable.

- The rate is based on the BankWest reference rate. However, the BankWest business overdraft reference rate is currently 9.61 per cent and the business market reference rate is 8.25 per cent.
- The nominal risk free rate of debt for the Water Corporation is 5.52 per cent, and the debt margin is 2.72 per cent (including the costs of issuing debt). This means that the total nominal cost of debt to the Corporation is 8.24 per cent. Allowing for some additional costs for debt collection, this suggests that the penalty rate should be no higher than 9.24 per cent.
- Local governments in WA use a 10 per cent rate of interest on overdue accounts;
- Sydney Water uses a rate of 10 per cent, although this is only charged on larger commercial and industrial accounts and not on residential accounts.

The Authority recommends that the penalty rate on overdue accounts be no more than 9.24 per cent, which is one percentage point above the nominal cost of debt as represented in the weighted average cost of capital.

6.4.2 Variations Due to Equity Considerations

There are a range of exemptions and concessions which were put in place primarily for equity and political reasons.

Public and Charitable Institutions

In the metropolitan area, various types of customers are exempt from the fixed charge for water and receive discounts on the fixed charge for wastewater services; e.g. land belonging to a religious body, land used as a public hospital, public school, public library, public museum, public art gallery, land used for charitable purposes, not for profit entities such as sporting clubs, societies and associations, land used for horse racing, greyhound racing and trotting and cemeteries.

In country areas, these customers pay reduced water usage charges and wastewater service charges.

There is no efficiency basis for these exemptions or reduced charges. If such services are to be subsidised, it would be more transparent for these subsidies to be delivered through direct grants to these institutions rather than through water and wastewater pricing.

At present the discounts to these customers are paid for by higher charges to standard customers. For the purpose of this report, the Authority has calculated tariffs on the basis that the current cross-subsidy is removed and replaced with a CSO. The CSO is estimated to be approximately $25 million per year.

There is a significant impact on non-residential metropolitan wastewater customers from making this change, because the cross-subsidy to wastewater customers receiving the discount is estimated at $15 million per year. If the current situation were to continue, average non-residential metropolitan wastewater charges would increase from $1,447 per year in 2008/09 to $1,617 per year in 2012/13. With the unwinding of the cross-subsidy, average non-residential metropolitan wastewater charges increase to $1,554 per year in 2012/13 (in real dollar values of 2009).

The annual cross-subsidy to metropolitan water customers is $4.3 million and to country wastewater customers is $6.0 million.

Community Residential

Community residential properties (communal properties with more than one family) receive a 50 per cent concession on the fixed water charge and water usage charges; and a reduced wastewater service charge.

Community residential properties are primarily indigenous communities. The concessions on water and wastewater prices charges were introduced as a practical way of delivering pensioner discounts to residents of these communities, many of which are welfare recipients.[40] Due to the communal ownership and organisational structure of these communities, it is more practical to apply general concessions to the communities as a whole rather than to apply discounts on the basis of individual bills and grants. The Authority does therefore not recommend changing the current water and wastewater charging approach for community residential properties.

[40] Water Corporation customers who hold a Pensioner Concession Card or State Concession Card are entitled to a rebate of up to 50 per cent on the annual service charge for holders and up to 50 per cent concessions on water usage charges up to a threshold amount (150 kL for Perth customers, 400 kL for country customers in the south, and 600 kL for country customers in the north). Holders of the State Seniors Card are entitled to a rebate of up to 25 per cent (capped) on the annual service charge for holders. A rebate of up to 50 per cent on the annual service charge is also available to customers who hold both a State Seniors Card and a Commonwealth Seniors Health Card.

Farmland Water Pricing

Water usage charges for farmland (both metropolitan and non-metropolitan), local government standpipes and stock watering are currently discounted, at a fixed price of $1.083 per kL.

Farmland water was put in place largely as a supply of last resort – farmers were expected to make on-farm water arrangements, with standpipes available in emergencies. Farmland water is supplied mainly through the Goldfields and Agricultural Water Supply Scheme (GAWS), sourced from Mundaring Weir, and the Great Southern Towns Water Supply Scheme, sourced from Harris Dam. The water is treated at source, but transported across large distances, and is non-potable.

The uniform price for farmland water was put in place largely for equity reasons: the price paid for water by metropolitan farms or standpipes is the same as the price paid by non-metropolitan farms drawing water from the same system. However, the price is not cost-reflective, and in the case of water drawn from the GAWS, is below the opportunity cost of the water on that system.

A cost-reflective approach to pricing farmland water would indicate that charges be priced at the country non-residential water usage tariffs for each scheme. Country non-residential charges for each town are set to recover the residual costs of the scheme, that is, costs that are not recovered through residential revenue. While some treatment costs may be avoided in supplying farmland water (non-drinking quality water has lower treatment costs), there are still transportation costs and the costs associated with maintaining the network to supply farm properties. The price paid for farmland water would in that case range between $1.40 per kL and $5.40 per kL, depending on which scheme supplied the farmland water and which of the 15 town bands the scheme was classified.

6.4.3 Variations Due to Practical Reasons

Long-Term Residential Caravan Bays

Charges to customers who live in strata-titled or long-term residential caravan bays vary from standard charges:

- a reduced fixed charge for water services;
- for water usage, customers pay the metropolitan residential standard charge for the first 150 kL of usage, and then the highest non-residential charge for usage above this amount;
- a reduced minimum fixed charge for wastewater services;
- a fixed charge for drainage services, lower than the standard minimum charge, and no additional GRV-based charge.

These charges were developed in recognition of a combination of factors:

- residents of caravan bays have lower consumption of water and wastewater services and impose lower costs on the system (hence the reduced service charges);
- the dual residential/commercial status of caravan parks. Thus, water usage is priced at the residential rate for essential water use for long-term residents. Water use above this is deemed to be used for commercial purposes (such as

maintaining the caravan park grounds and for short-term residents) and is priced at commercial rates; and

- GRV valuation is not feasible for caravan bays.

If the residential status of long-term caravan bay residents is confirmed, the Authority considers that it would be appropriate to charge these residents the standard residential fixed charges for water and wastewater services.

Strata-Titled Storage Units and Parking Bays

Strata-titled storage units and strata-titled parking bays pay:

- a reduced minimum wastewater service charge; and
- a fixed charge for drainage services, lower than the standard minimum charge, and no additional GRV-based charge.

The structure and level of these charges reflects the difficulty in obtaining GRVs for storage units and parking bays and their lower contribution towards drainage costs, comparative to standard residential units.

Mixed Commercial/Residential Properties

Properties may have a mixed use (such as commercial properties which also contain residential units, but with no strata titles to distinguish between residential and commercial water use). The charging approach in this case is the same as that applied in the case of caravan parks, with a discount offered for the first 150 kL (assumed to be essential water use for residential purposes) and commercial rates above this amount. This is a practical solution to setting water charges for these properties, and it is unlikely that an alternative approach (e.g. imposing strata titles) would improve cost reflectivity without adding substantial administrative costs.

Small Mining Customers

Unlike large mining customers, small mines that use less than 3-5 ML per day do not have individual supply contracts with the Water Corporation. The costs of negotiating individual contracts for each of these mines would be substantial, so small mining customers are instead charged a set usage charge of $1.899 per kL. This is an appropriate practical solution. However, the Authority considers that the cost reflectivity of this price could be improved by making the charge consistent with the non-residential consumption usage charges (for the relevant scheme).

Vacant Land

Vacant non-residential land is charged for the availability of wastewater services at a reduced minimum fixed charge (about a third of the minimum non-residential charge), as well as a GRV-based charge. The Authority considers that it is appropriate for vacant land to be charged less than non-residential charges, since vacant land has no fixtures and available services are not being used. However, non-residential charges are now based on fixtures and volume (not on GRV). It would therefore be preferable to base vacant land wastewater charges on a fixed charge alone and remove the component based on GRV.

PART TWO: TECHNICAL RECOMMENDATIONS

7 Method Used to Determine Revenue Requirements of Each Service Provider

7.1 Terms of Reference

This section addresses the following specific issue referred to in the Terms of Reference:

- the method used to determine the revenue requirements of each service provider;

7.2 Recommendations

Recommendations

23) The tariffs of the Water Corporation, Aqwest and Busselton Water be set for a three-year regulatory period, and no longer be revised on an annual basis (other than to adjust for inflation).

24) The Water Corporation be able to retain, for the length of the regulatory period, any operating expenditure savings that are greater than the savings required to achieve the operating expenditure efficiency target.

25) Reviews of service standards for Water Corporation, Aqwest and Busselton Water be aligned with, and incorporated into, tariff reviews.

26) Tariffs be escalated on an annual basis in line with the annual increase in the eight city average Consumer Price Index.

27) For the purpose of calculating revenue requirements, gifted assets be excluded from the calculation and cash contributions be offset against capital expenditure in the year in which the cash contributions are received. However, any revenue adjustment associated with changing the regulatory accounting treatment of developer contributions would not commence until the next regulatory period (and would then be recovered in a similar manner to the recovery of capital expenditure, over the average life of the Water Corporation's capital expenditure).

28) CSO payments be set for a three year regulatory period using the same financial model used to calculate tariffs.

7.3 Reasons

The Authority's recommendations in this section would have the consequence of treating Water Corporation, Aqwest and Busselton Water in a similar manner to the treatment of other regulated entities. Economic regulation attempts to achieve outcomes for consumers that are consistent with the outcomes that would be expected in a competitive market. Other regulated entities typically have their tariffs set for a certain period and inflationary adjustments to tariffs are made on the basis of movements in the eight-city Consumer Price Index. In addition, other regulated entities are generally required to

review their service standards at the same time as the tariff review (because of the need to demonstrate that customers are willing to pay for any change in service standards).

The Authority has also considered a number of technical issues, such as the treatment of developer contributions and the calculation of CSOs, that influence the revenue requirements of the service providers. The Authority has accepted a proposal by the Water Corporation to change the treatment of developer contributions but has done so in a way that moderates the impact on tariffs. At present, CSOs are calculated by the Water Corporation using a method that differs from the method for calculating tariffs. The Authority recommends that CSOs be set for the three year regulatory period and that CSOs and tariffs be calculated using the same cost model.

7.4 Background

The approach adopted by the Authority to determine the revenue requirement is referred to as the 'building block' approach as each cost component is calculated individually to determine the total revenue requirement. This is the typical approach adopted in most regulated industries including water, wastewater, gas, and electricity.

The revenue requirement is calculated using the building-block method as follows:

Revenue requirement = return on capital *plus*

return of capital (depreciation) *plus*

operating and maintenance costs

where the return on capital = rate of return[41] *multiplied by*

the regulated asset base (which is rolled forward each year by adding capital expenditure and subtracting depreciation).

A return on capital is necessary to ensure that the business receives a return on its investment sufficient to provide it with an incentive to continue to invest. The return of capital, also referred to as depreciation, allows the business to recover capital invested over the life of the investment. Operating and maintenance costs are recurrent costs required for the ongoing operation of the business.

The approach currently adopted by the Authority to calculate tariffs for the Water Corporation, Aqwest and Busselton Water, which is under review in this inquiry, involves using the building block approach to calculate target revenue for the period from 2005/06 through to 2017/18. The target revenue is calculated on the basis that the service providers achieve a target level of operating expenditure efficiency.

The target revenue and forecasts of demand for services are then used to calculate a smooth tariff path, which gradually adjusts tariffs from current levels to target levels. These tariffs are updated through annual reviews that take into account updated forecasts of demand and efficient costs.

[41] The calculation of the rate of return is discussed in Appendix F.

7.5 Assessment

The Water Corporation indicated its support for the building block approach to revenue determination.

> The Corporation agrees with the overall approach used by the ERA in determining the total revenue requirements of the organisation. Furthermore, it supports the various reforms that have been introduced following the previous reviews. The Corporation would prefer to see these reforms implemented prior to re-opening the debate on which approach to pricing is appropriate. (Water Corporation submission on Issues Paper, p3)

However, an implication of the current approach is that the service providers do not have any risk that their efficiently incurred costs will not be recovered by tariffs. For example, if demand turns out to be lower than expected, tariffs will be adjusted upwards to generate the revenue requirement. Similarly, if costs turn out to be higher than expected, tariffs will also be adjusted upwards to generate the revenue requirement. The approach of having costs and revenue balance over the period commencing in 2005/06 removes any risk for the service provider (with efficiently incurred costs).

Compared to the regulatory approaches applied in other Australian jurisdictions and to other utilities in Western Australia, there are a number of differences in the way that tariffs are calculated for the three water utilities. The differences include:

- the form of incentive regulation is limited to operating expenditure efficiency targets;
- there is limited independent review of capital expenditure; and
- the lack of alignment between the review of tariffs and the review of service standards.

In addition, the Authority considered the following issues that influence the determination of revenue requirements for each service provider:

- treatment of inflation;
- treatment of developer contributions;
- calculation of developer revenue; and
- for Water Corporation, the calculation of CSO payments.

7.5.1 Incentive Regulation

Background

A central aim in the determination of prices for services provided by natural monopolies is to encourage the efficient provision of services. In circumstances where prices for services are subject to economic regulation, prices and price structures are typically designed to provide incentives for the regulated businesses to seek efficiencies in the provision of services that will ultimately benefit consumers.

The current approach provides incentives for the Water Corporation, Aqwest and Busselton Water to achieve cost savings by setting required revenues on the basis of efficient capital and operating expenditures.

The current approach differs from other jurisdictions, where efficiency incentives are provided by allowing service providers to retain cost savings that they achieve below an

efficient price path. This approach is referred to as "incentive regulation" and is used by IPART and ESC. Under such an approach:

- tariffs are calculated on the basis of efficient cost forecasts and are locked-in for a designated "regulatory period", typically three to five years (with annual adjustments for inflation);
- service providers are allowed to retain any cost savings achieved below the efficient price path for a period of time (e.g. until the next price review) before prices are adjusted downwards to reflect the new efficient costs.

The incentive for the regulated business to achieve cost savings is that the business is able, for a specified period of time, to keep any savings below the forecast level of costs. Customers also benefit from the cost savings as prices are reduced (to the efficient cost levels) after the specified period. In this way, there is a sharing of the cost savings between the service provider and customers.

The setting of price caps for a specified regulatory period is the most common form of incentive regulation in Australia for regulated water utility services. It is also used in the regulation of gas network charges in WA, where tariffs are set for particular transportation services. In the case of gas network charges, demand risks are borne by the transportation service provider, as there is no specific adjustment of revenues for demand forecasting errors. Revenues in each year depend on the regulated price, costs incurred and the actual quantity sold. As a result, the regulated business will earn more in years of higher sales. There is then an opportunity for the service provider to under-estimate demand (as if accepted, this would result in higher tariff caps), and the need for regulatory scrutiny of demand forecasts.

Another form of price control used within the context of incentive regulation is a "revenue cap", where the regulated utility is permitted to earn a fixed amount of revenue over a period. This is used in the regulation of both electricity transmission and distribution prices in Western Australia. Under this approach, Western Power's regulated revenue in each year is based on its forecast demand, so that if sales are higher than forecast, Western Power foregoes any potential up-side in revenue, and if sales are lower than forecast, Western Power still gets the revenue that was based on the (higher) forecast demand. There is opportunity for the service provider to over-estimate demand (as if accepted, this would result in a higher revenue cap), and the need for regulatory scrutiny of demand forecasts.

Incentive-based approaches may be particularly effective where the regulated business is a private sector business and can be highly motivated by profits and/or financial rewards to management. However, incentive regulation can also be effective in the case of public corporations, as any retained cost savings could be used to provide dividends to the government, and also potentially to reward managers.

Assessment

The Authority has considered the relative merits of the following issues: fixing the price path for the regulatory period, allowing service providers to retain operating efficiency savings when targets have been exceeded, placing the demand risk on service providers and providing incentives to meet service standards.

Fixed Price Path

The Water Corporation recommended, in its response to the Issues Paper, that the option of a three-year fixed real price path be considered. This option was supported by the Department of Treasury and Finance in its response to the Draft Report.

Busselton Water submitted that fixing revenues for three years would increase its risks in relation to the short term recovery of unforeseen costs. The Authority does not concur with this view because any efficient costs incurred but not recovered in revenue during a regulatory period would be recovered in future regulatory periods.

The Authority considers that there is merit in setting a fixed real price path every three years as this would provide greater certainty for service providers and customers.

Retaining Additional Operating Efficiency Savings

The Authority also considered that if service providers are able to exceed the target level of efficiency savings, then the providers should be able to retain these savings for the length of the regulatory period. At the next regulatory review, the new efficiency target would apply to the actual (lower) base level of operating expenditure.

The Water Corporation did not support the retention of operating efficiency savings achieved during a regulatory period.

> [T]he Corporation's charges should be based on actual expenditure, provided it is incurred efficiently. The Corporation's justification for this position is as follows:
>
> Encouraging the Corporation to achieve outcomes that are consistent with those expected by a private company in a competitive market is only effective for companies that can reward shareholders (and management) with higher financial returns. They are unlikely to be effective for a company primarily motivated by maximising service levels within a budget constraint, such as the Corporation;
>
> In reality, the Corporation manages to a constrained operating budget and any above-target efficiency gains are spent on improving levels of customer service, or investing in management initiatives that improve the long-term efficiency and effectiveness of the business. The Corporation's financial performance and efficiency incentives will not be altered as a result of this recommendation;
>
> There are better options available for encouraging the efficient delivery of services. Efficiency targets and robust internal prioritisation approaches for example, both of which are currently in place. As concluded by Halcrow Pacific in January 2009 while undertaking a review on the ERA's behalf:
>
> > *"We are satisfied that the Corporation has developed a series of robust and rigorous operational planning and delivery process that align appropriately with the Corporation's Risk Framework and its overall corporate and strategic objectives (p. 80)"*
>
> There is little point in introducing a requirement simply because it is considered standard regulatory practice. The merits of the requirement need to be demonstrated in the context of the specific circumstances applicable to the organisation.
>
> (Water Corporation submission on Draft Report, Part B, p23)

The Water Corporation considers that its incentives to operate efficiently will not be impacted by the potential to retain any additional savings and that efficiency targets are sufficient. The Authority notes that the efficiency target currently applies to base operating

expenditure, rather than expenditure that it intended to improve levels of service to customers. A regulatory review audits expenditure that is claimed to improve levels of service (to ensure the expenditure is efficient). If the expenditure is found to be inefficient, the Water Corporation cannot recover the expenditure from customers (see section 8.5 for the assessment of level of service expenditure for this review). The benefit to the Water Corporation from being able to retain any additional efficiency savings on base expenditure is that this revenue could then be spent on corporate initiatives, management incentive schemes or other programmes which would not be subjected to regulatory scrutiny. The Authority considers that such an arrangement would provide an additional incentive to the Water Corporation to exceed its efficiency targets.

The Department of Treasury and Finance submitted the following view:

> The rationale behind these recommendations and the intended incentives that would be created by their implementation are acknowledged and supported. However, such settings may result in potentially unsatisfactory operating practices. For example, it is a concern that after the pricing review service providers may cut back or delay essential maintenance and upgrades in order to increase profits in one regulatory period. In the following period a provider might then resubmit its forecasts for review with greater expenditure required in order to offset any damage incurred by the previous regulatory period's delay to its maintenance and upgrade program. Such an occurrence may be difficult to prevent with most oversight devoted to new expenditure and not decisions to delay service maintenance and upgrades.
>
> (Department of Treasury and Finance submission on Draft Report, p18)

The Authority notes the Department of Treasury's concerns but also notes that the efficiency targets apply to the base level of expenditure in 2005. That is, base operating expenditure is reduced each year by the efficiency target and there is no opportunity for the Water Corporation to resubmit higher forecasts at future regulatory reviews. There is an opportunity for the Water Corporation to incur operating expenditure on projects to improve levels of service. However, when the Authority reviews these projects, one of the factors considered is whether the project should be funded out of base operating expenditure. There is therefore little scope for the Water Corporation to shift maintenance expenditure from base expenditure into service expenditure.

Overall, the Authority recommends that the Water Corporation should be provided with the incentive to retain any additional savings achieved from exceeding the efficiency target that applies to base operating expenditure.

Demand Risk

At present, the Water Corporation bears no demand risk (if actual demand varies from forecast demand) as revenues are adjusted for any demand forecasting errors. The rationale for the current approach is that water businesses have less control over their sales than regulated businesses in other utility industries. This is because the level of water restrictions and the timing of when restrictions are eased or lifted are affected by year-to-year weather patterns and are generally matters for government to decide rather than, necessarily, the water businesses themselves. As water restrictions have been made permanent, this source of demand risk has been reduced. However, the recent trial of winter sprinkler bans indicates that there continues to be some uncertainty in the timing of demand management responses.

Demand risk is generally applied to regulated businesses in an attempt to replicate the pressures that apply to competitive businesses. The need to understand and respond to the uncertainties of demand drives a business to examine its cost structures and be

prudent in its planning. Such an approach involves a greater scrutiny of demand forecasts by regulators, (as service providers would have an incentive to under-forecast demand). However, the Authority considered that the potential benefits to customers could outweigh these concerns, and recommended in its draft report that the service providers should not be compensated when actual demand varies from forecast demand over the regulatory period.

The Water Corporation disagreed with the Authority's draft recommendation that the Corporation, rather than customers, should bear the demand risk. The Corporation submitted that its demand forecasts are still subject to considerable unpredictability due to seasonal weather variations, climate change, and uncertainty about future land development activity. The Corporation also submitted that, like private companies, it should be able to pass on unmanageable risks, and if it could not, this would add to the riskiness of the business and require a higher rate of return and higher prices. Further, the Corporation maintained that:

- the potential for gaming of demand forecasts would add to the costs of regulation; and
- the Corporation would have an incentive to fall short of its demand management targets.

Busselton Water submitted that as it has no control over government policy (including water efficiency measures) and demand is highly unpredictable, it would need to use conservative demand forecasts if it were required to bear demand risk.

The Authority accepts that, due to the impact of changing climate, there remains considerable uncertainty around future demand for water in Western Australia despite the removal of uncertainty regarding water restrictions. Therefore, the Authority considers that it is appropriate that revenues continue to be adjusted for differences between actual demand and forecast demand, and that customers continue to bear the demand risk associated with forecasting demand.

Incentives to Meet Service Standards

The Authority considered whether service commitments could be refined to provide additional incentives to service providers to meet service standards. Some water utilities, such as Hunter Water and Sydney Water, have Guaranteed Service Levels, under which customers are financially compensated if the providers do not meet particular performance targets. For example, customers of Sydney Water who experience a planned interruption of more than five hours receive an automatic rebate of 10 per cent of their quarterly water and/or sewerage service charge. A level of compensation is incorporated into current arrangements in Western Australia: for example, Water Corporation provides customers who experience three separate confirmed interruptions (of more than one hour) to their potable water supply with a 100 kL allowance against their annual consumption.

The Authority invited submissions on whether a stricter compensation regime should be implemented, such as through Guaranteed Service Levels and received no comments. The Authority makes no recommendations in this review on the strengthening of incentives to meet service standards, but considers that this issue should be examined as part of any future review of service standards.

Conclusion

Overall, the Authority considers that the tariffs of the Water Corporation, Aqwest and Busselton Water should be set for a three-year regulatory period, rather than being revised on an annual basis (other than an annual adjustment for inflation). In addition, the Water Corporation, which has an explicit operating efficiency target, should be permitted to retain (for the length of the regulatory period) any operating expenditure savings that exceed the target. The manner in which the Water Corporation spends these savings should not be subject to regulatory scrutiny.

7.5.2 Review of Capital Expenditure

Background

Under a standard approach, an independent regulator examines significant capital expenditure proposals and allows only expenditure that is considered prudent and efficient to be included in the regulated asset base (upon which a return is subsequently calculated). Such assessments are undertaken at the time of the regulatory review (e.g. once every three years) and also during a regulatory period.

For example, in the case of regulated electricity networks in WA, proposed major augmentations must pass a Regulatory Test (conducted by the Authority) to assess whether the proposed augmentation maximises the net benefit after considering other options.[42] The test aims to provide an incentive to the service provider to assess all reasonable alternatives when considering a network augmentation (including options which may not involve network augmentation).[43]

There is a further regulatory test for regulated gas and electricity networks known as the New Facilities Investment Test (NFIT), which determines whether actual or forecast new facilities investment may be added to the capital base and recovered through network tariffs applied to users of the network.[44]

- To pass the NFIT, an investment (or part of an investment) must not exceed the amount that would be invested by a service provider efficiently minimising costs, taking into account any economies of scale or scope in capacity expansions, and the need to build capacity in anticipation of future demand in order to achieve the lowest sustainable cost of providing the service over a reasonable period.
- The NFIT also requires that the investment either provides benefits to the wider network, or improves the safety or reliability for the network, or is able to generate incremental revenue sufficient to cover its incremental costs.
- However, the NFIT does not require the service provider to assess the investment against other options, as in the case of the Regulatory Test.

Under the current approach to setting water and wastewater tariffs, the Authority examines capital expenditure as part of each major review, such as this one.[45] However, there is no independent regulatory oversight of capital expenditure during a regulatory

[42] See Chapter 9 of the *Electricity Networks Access Code 2004*.

[43] The regulatory test in electricity was introduced in order to overcome a bias towards network solutions, as opposed to stand-alone options, renewable energy options or demand management.

[44] See section 8.16 of the *National Third Party Access Code for Natural Gas Pipeline Systems* and section 6.52 of the *Electricity Networks Access Code 2004.*

[45] At the request of government, the Authority also updates its tariff advice to Government on an annual basis. However, capital expenditure is not examined during these annual updates.

period. Nevertheless, significant capital expenditure proposals are reviewed by the Department of Treasury and Finance and are subject to sign-off by the Government's Cabinet Economic and Expenditure Reform Committee.

In the draft report, the Authority recommended the introduction of a capital expenditure efficiency test to the Water Corporation. The test would be conducted by the Authority under the Authority's inquiry function and would aim to establish that any proposed major capital investment:

- maximised the net benefit, following consideration of all other reasonable options that would deliver the service (similar to the Regulatory Test used in electricity networks); and
- was consistent with the service provider seeking to efficiently minimise costs over a reasonable period (similar to the first part of the NFIT test used in electricity and gas). This "cost minimisation" assessment would need to take into account factors such as economies of scale and scope, the "lumpy" nature of capital expenditure, any wider system benefits of the investment, and any issues regarding the safety and reliability of the network.

The test would not include an assessment of whether the incremental revenue associated with an investment can recover its costs, as the benefits of investments in water and wastewater infrastructure are often not attributable to particular users. Instead, benefits are often dispersed widely amongst users of the infrastructure, both in space and in time, or may be undertaken for health, environmental or town-planning reasons, rather than commercial considerations.

The Authority sought submissions on the appropriate threshold level of expenditure for which any regulatory test of proposed major capital investment would apply. For Western Power's transmission infrastructure, the threshold is $30 million, while for distribution infrastructure, the threshold is $10 million.

Assessment

The Water Corporation opposed the application of an efficiency test to its capital expenditure, submitting that its capital project prioritisation and approval processes (within an overall capital budget constraint) are robust and provide a disincentive to gold-plating. It further submitted that the Authority did not have sufficient information to make decisions on the efficiency or prudency of large capital projects.

> [T]he Corporation does not wish to propose an 'appropriate level of the expenditure threshold' as it considers the more pertinent question to be whether the ERA should be involved in the approvals process in the first instance.
>
> As a state-owned service organisation, the Corporation operates under the financial constraints of the State Government. While an independent review of expenditure commitments may be warranted for an organisation that has access to unlimited funding and incentives to over-invest, this is not the situation with the Corporation.
>
> Regulatory oversight as proposed by the ERA is only required if there is an incentive for a monopoly service provider to "gold-plate" or over-invest to receive a guaranteed regulated return on their larger investment. There is no incentive for gold plating or early delivery as this would reduce the funding available for other necessary projects, and would not result in higher returns.
>
> With financial constraints in place, projects that can be justified on a stand alone basis need to be prioritised and some are deferred to meet budget targets. Projects are

prioritised against multiple objectives to achieve the best outcome with the available funding. For example, the Corporation's capital budget was reduced by $560 million in the latest State Budget, requiring many projects to be deferred. This was undertaken using the Corporation's risk based prioritisation process.

Existing approved capital funds are prioritised across all potential projects. The extent to which one project is funded not only depends on the merits of that initiative, but on the competing demands of other projects. Likewise Cabinet, after considering the advice of the Department of Treasury and Finance, approves and allocates new capital funding by assessing the various competing demands on the Government to deliver a suite of services. Specifically:

- The ERA is not in the best position to make the necessary trade-offs in terms of information and the context of the decision, especially with regard to alternative projects competing for the same funds;
- New business cases for additional funding are already provided to the Government via the Department of Treasury and Finance, and reflect Ministerial and Government priorities. Again, the ERA is not in the position to best assess Government's competing priorities.

The Board of the Water Corporation has in place sophisticated and well resourced processes to ensure optimised planning, option selection, capital prioritisation, business case development, and procurement and delivery strategies. The outcomes from these processes will be far more robust than any the ERA could put in place to make similar judgements. The ERA undertaking a capital efficiency test on the projects that are to proceed makes as much sense as the ERA undertaking a capital efficiency test on the projects that are delayed.

The quality of these processes is demonstrated in the review undertaken on the ERA's behalf by Halcrow Pacific for this inquiry. It appears that the recommendation is based on a standard regulatory approach without recognising the need (or otherwise) in the current situation.

Given the robust processes that are currently in place to achieve the same objective, the Corporation would expect that if the ERA had to subject their proposal to a Regulatory Impact Assessment it would fail to prove that the benefits exceeded the costs.

Finally, the Corporation is conscious that this recommendation has the potential to delay the approval process, adding another layer of administration and hence cost to the Corporation, the State Government and the regulator itself.

(Water Corporation submission on Draft Report, Part B, p25-26)

The Authority acknowledges that Halcrow Pacific concluded that the Water Corporation's processes were appropriate. However, as will be discussed in section 8.8, when Halcrow Pacific reviewed actual projects, they also found expenditure on some projects could have been more efficient.

The Authority does not consider that the pressures on the Water Corporation to achieve efficiency in its capital expenditure are as great as would be achieved in a competitive environment. Companies operating in competitive markets also have constrained budgets within which they prioritise projects, as well as the added incentives of matching competitors' prices and services standards. The Authority's concern is not so much that the quantum of total capital expenditure should be either greater or less, but rather that the expenditure on each project may not always be efficient. Consumers are impacted if expenditure on any particular project is inefficient, because it means that other projects (that improve levels of service) may not proceed.

The Department of Treasury and Finance noted that, while a capital expenditure efficiency test may be beneficial in the case of very large stand-alone projects, the Corporation's capital processes and large capital projects are already subject to review by the Authority as part of the tariff reviews.

> Caution should be exercised in considering the implementation of a capital expenditure efficiency test. In changing the regulatory framework to include a 'within-period' test for capital expenditure there should be a cost/benefit analysis of providing more oversight on service provider investment and whether any additional analysis may become overly burdensome compared to current procedures.
>
> While electricity networks may have such a test, there are significant differences between the two industries and maintaining similar regulatory devices may not be appropriate. For example, the New Facilities Investment Test (NFIT) referenced by the ERA is part of the Electricity Networks Access Code and third party access regime, yet there is currently no third party access arrangement for the water industry in Western Australia (although such arrangements are being considered by the Government in response to the ERA's recommendations contained in its Final Report on its Inquiry into Competition in the Water Sector).
>
> For unusually large and singularly identifiable capital projects (such as major new source development projects) there may be benefit in an ERA assessment of net benefits compared to other reasonable options, although such reviews will need to be considered on a case by case basis.
>
> Nevertheless, it is understood that under the existing pricing inquiry structure the ERA already examines the current and projected capital expenditure of the Water Corporation, including processes, which were noted as providing "confidence that capital projects are selected and prioritised appropriately"(ERA draft report p126).
>
> Given the positive review of the Water Corporation's capital processes, the ERA's own ability to examine capital works during the inquiry process and the Government's final decision-making powers for any investment (taking into consideration wider funding priorities), there may not be a need for additional within-period testing of capital investment efficiency.
>
> (Department of Treasury and Finance submission on Draft Report, p19-20)

The Authority does not consider that the absence of a regulatory code for the water industry provides rationale for not implementing a capital expenditure efficiency test. In essence, the water industry is no different to the gas or electricity network industries, which both require regulatory checks on the efficiency of capital expenditure. These may be carried out between regulatory reviews, if service providers require pre-approval of capital expenditure (to provide them with assurance that the capital expenditure will be added to the regulatory asset base at the next regulatory review).

The Authority does not consider that the addition of a regulatory test, based on a suitably high expenditure threshold, would impose too high regulatory or administrative costs. Rather, scrutiny of the expenditure decisions for a small number of the largest capital projects would provide a valuable additional check on the efficiency of these projects and would supplement the analysis undertaken by the Department of Treasury and Finance.

Overall, the Authority considers that the Department of Treasury and Finance is best placed to consider, on a case by case basis, whether there is value in having the Authority undertake an efficiency test of large capital expenditure projects. However, the Authority remains concerned that the pressures on the Water Corporation to undertake efficient capital expenditure are currently not as strong as they would be under a standard

regulatory arrangement where large projects are reviewed by an independent regulator prior to the expenditure being incurred.

7.5.3 Alignment of Reviews of Service Standards with Price Reviews

Background

The provision of services by the three water utilities is regulated under the *Water Services Licensing Act 1995*. This Act establishes a licensing scheme whereby the Water Corporation is granted an operating licence for provision of water supply services, sewerage services, irrigation services and drainage services; and the water boards are granted licences for provision of water supply services.

Licences are granted subject to terms and conditions that establish standards and requirements for the provision of services in respect of:

- processes for dealing with customer complaints;
- a requirement to establish a customer charter;
- establishment of committees of consumers for the purpose of obtaining consumer opinions on the service provider's prices and service standards;
- obligations to customers in respect of the availability and connection of services;
- reporting of customer complaints and incidents in the provision of services including non-compliance with water quality standards, overflows from wastewater infrastructure and interruption of water services;
- standards for the provision of services including standards for customer service, health-related aspects of water quality, water pressure and flow, interruptions to water services, overflows of sewerage systems, and design criteria and performance requirements for drainage schemes;
- reporting of compliance with standards for the provision of services;
- maintenance of an asset management system; and
- performance of operational audits, being audits of the effectiveness of measures taken by the service provider to maintain quality and performance standards.

The Authority can amend service standards and performance targets of licensed service providers as part of the licence approval or monitoring process. Licensees are required to carry out an asset management systems audit and an operational audit at least every two years, or such longer period as the Authority allows.[46] Any revisions of service standards as part of the license approvals process tend to occur in response to issues with particular service standards as they arise. For example, the Water Corporation's operating licence lists a number of exemptions to pressure and flow standards for potable water supply for some schemes.[47] The exemptions were requested by the Corporation on the grounds that the infrastructure costs required to meet required standards exceeded the benefits of meeting the standards.

The Authority also reviews and approves the Customer Service Charters which service providers are required to establish as part of their licence conditions. Customer Service

[46] *Water Services Licensing Act 1995*, sections 36(1)(c) and 37(1).

[47] Water Corporation's Water Services Operating Licence, Schedule 4, available on the Authority's web site.

Charters set out the terms and conditions upon which service providers intend to provide their services. In approving Charters, the Authority utilises guidelines on Customer Service Charters developed by the Authority.[48] The Authority has approved the Customer Service Charters for the Water Corporation, Aqwest and Busselton Water.

Assessment

Currently, there is a lack of clarity regarding the Authority's process for reviewing service standards for the Water Corporation, Aqwest and Busselton Water. Service standards could be reviewed as part of the triennial review of their tariffs, such as this inquiry. However, service standards are also regulated to some extent through the licensing process, with operational and asset management system audits taking place generally every two years. It may be appropriate to better align reviews of service standards with price reviews, since service standards provide the framework for expenditure requirements, and ultimately drive prices.

In other jurisdictions, reviews of service standards form the starting point for pricing reviews.

- The Essential Services Commission in Victoria (ESC) has a Customer Services Code which requires each water and wastewater business to provide a Customer Charter setting out their service standards and performance targets. The service standards and performance indicators are set by the ESC, based on the past performance of the business and the scope for improved performance. Service standards are reviewed by the ESC as part of the periodic price reviews, which commence with water businesses submitting their water plans to the ESC. The water plans set out the forward-looking costs required by each business to meet (or raise) its service standards or improve performance. These costs are then reviewed by the ESC. Businesses must provide some justification for raising service levels where this impacts on costs of service.
- Similarly, in NSW, IPART's price reviews begin with an assessment of service obligations, including:
  - what services the agencies are required to deliver and the respective standards;
  - consumer expectations about service levels; and
  - any operational or environmental constraints that impact on the capacity to deliver services.

  Water agencies are required to provide information to IPART on how they have ascertained the appropriate customer service levels and how these service levels relate to forecast costs. In addition, water agencies need to report on their performance against output measures set by IPART and recommend appropriate output measures for the next regulatory period.

[48] In August 2006, the Authority published the *Customer Service Charter Guidelin*es for water, electricity and gas licence holders, setting out the minimum requirements for Customer Service Charters, guidelines for the review of Charters, and the process used by the Authority to approve Charters in the case of water services (and review them in the case of gas and electricity). The guidelines recommend that Charters include explanations of: the utility and its service values; conditions for connection; the levels of service that customers may expect; the utility's powers; communication procedures; contact information; and complaints resolution procedures.

The Authority is of the view that there would be advantages in aligning the reviews of service standards for the Water Corporation, Aqwest and Busselton Water to coincide with the three-yearly price reviews.

The Water Corporation and the Department of Treasury and Finance supported the Authority's proposal to align reviews of service standards with tariff reviews. The Water Corporation submitted that:

> [The Corporation] notes the advantages of doing this every three years prior to completing the periodic pricing review – provided the magnitude of the task does not compromise the effective review of either process. The ERA is best placed to determine this.
>
> In reviewing the service standards, the Corporation encourages the ERA to consider:
>
> - The degree to which the Corporation should be permitted to exercise its professional judgement and discretion in the provision of services. Meeting the minimum service standards is not always optimal;
> - The budgeting approach by the Corporation and the context in which expenditure items are prioritised relative to the competing demands of numerous internal and external pressures;
> - In some instances, efficient operating expenditure needs to be considered relative to the impact on capital requirements or alternative capital intensive solutions. Asset maintenance and demand management initiatives are good examples of this; and
> - The numerous additional service standards either imposed or recommended by a multitude of other agencies, not just the Department of Water, the Department of Environment and Conservation, and the Department of Health.
>
> (Water Corporation submission on Draft Report, Part B, p26-27)

7.5.4 Treatment of Inflation

Background

The Corporation and Water Boards have historically sought an across-the-board increase in tariffs based on the inflation rate that has been provided by the Department of Treasury and Finance (for the purpose of increasing the price of government services in the budget). The inflation rate is the average annual four quarter increase in the Perth Consumer Price Index (**CPI**) (for the four quarters to September).

Submissions

> With regard to forecasting the capital and operating requirements for service delivery, costs should be increased using indices that reflect the operating and construction environments specific to the individual utility. The Corporation has developed its own Capital Cost Index (CCI) and an Operating Cost Index (OCI) for this purpose. Both the CCI and OCI are determined using a combination of indices supplied by the Australian Bureau of Statistics.
>
> For pricing purposes however, once the actual expenditure to be incurred has been estimated, real price escalations should be calculated using the "Australian 8 city average Consumer Price Index". This includes the escalation of the existing capital base justified on the basis that (theoretical) investors seeking a real rate of return are not limited to investing their capital solely in Western Australia.

> In applying this approach, it is recognised that using a different CCI and OCI for budgeting purposes compared to the CPI for prices purposes, will result in real price changes where there are differences between the indices. These real price movements are necessary to fund the construction and operation of services facing specific terms of trade cost pressures.
>
> (Water Corporation submission, p51)
>
> The DTF requires its government owned service providers to use the 'Budget rate' which is based on the actual, annual rate of inflation measured to September each year. That said, any further information the ERA can provide regarding an alternative regulatory approach to the treatment of inflation would be welcomed. (Department of Treasury and Finance submission, p16)
>
> The Board would….suggest that the Consumer Price Index (CPI) for Perth be the standard benchmarked against as this more accurately reflects true cost impositions for Busselton Water, rather than the eight city average. (Busselton Water submission on draft report, p4)

Assessment

The general approach applied by regulators to annual tariff escalation is to apply the most recent annual increase in the eight city average CPI.[49] The main reason for using an Australia-wide index is that Australia-wide inflationary expectations are built into domestic capital markets and therefore into the rate of return that is applied to determine an appropriate revenue requirement. It would be inconsistent to set the revenue requirement for a utility on the basis of one inflation measure but allow the utility to escalate its tariffs on the basis of a different inflation measure. Further, such an approach could result in the utility earning revenue that exceeds its costs for a period of time (although it would be expected that the two inflation measures would converge over time).

Applying the standard regulatory approach to tariff escalation to the water utilities could place the water utilities under greater pressure to make productivity gains during times when the eight city average CPI is increasing at a lesser rate than the Perth CPI, which is the situation at present. However, the Perth CPI has been significantly impacted by increases in housing costs, which may be unrelated to the water utilities' cost drivers.

A further reason why it may not be appropriate to base the cost escalation increase on local factors is that two thirds of a water utility's costs typically relate to:

- a return on assets, which is a cost influenced by financial markets; and
- depreciation, which is the recovery of capital expenditure sourced more broadly than from the local market.

The Authority's recommendation is that annual tariff escalation be based on the most recent annual increase in the eight city average CPI.

[49] The use of the eight city average is consistent with approaches adopted by regulators in other jurisdictions such as the Independent Pricing and Regulatory Tribunal in New South Wales, the Independent Competition and Regulatory Commission in the Australian Capital Territory and the Essential Services Commission in Victoria.

7.5.5 Treatment of Developer Contributions

Background

There are alternative methods for treating developer contributions so that a service provider does not benefit from assets that it has not itself funded.

Developer contributions are in two forms: either in cash or in the form of gifted assets.

The current approach underlying existing tariffs is to:

- treat gifted assets as capital expenditure (which means the assets are added to the asset base, and costs are calculated for a return on those assets as well as depreciation);
- recognise gifted assets as revenue in the year the gifted assets were received (which exactly matches the additional costs that are created from treating gifted assets as capital expenditure);
- treat cash contributions as revenue in the year received; and
- calculate tariffs at the level required to balance costs and revenue, which means that any revenue acquired from developers reduces the tariff revenue required to be raised from customers.

Submissions

The Water Corporation has proposed that developer contributions be treated differently:

> The Corporation's strong preference is to change the current approach by either:
>
> - Excluding developer's asset contributions from the asset base and accordingly, not recognising them as upfront revenue in the year received. Similarly, cash contributions would be netted-off against the asset base and not recognised as revenue; or
> - Including asset contributions in the asset base and recognising the revenue equivalent to the cost of the assets over their life. Cash contributions should be spread over the average life of the Corporation's conveyance assets (at least 50 years).
>
> Both approaches result in spreading the benefit provided by the contribution over the life of the asset.
>
> (Water Corporation submission, p52)

The Water Corporation noted that their preference is based on minimising pricing volatility and on intergenerational equity.

> While it is acknowledged that all alternatives discussed by the ERA deliver the same amount of revenue over time, the Corporation's preference is based on minimising pricing volatility and on intergenerational equity. Assets constructed by the Corporation and those gifted to it from land developers typically have very long lifecycles. Where developers have contributed to the cost of initial construction, it is only appropriate that adjustments are made to the price for all customers (that is, current and future customers all using the same assets). Under the ERA's current approach, customers using assets now receive the revenue benefit of the contribution, at the expense of those in the future.
>
> Furthermore, while the ERA may remove some of the lumpiness by smoothing the financial flows over 10 years, the Corporation notes that its alternative removes all of lumpiness,

> smoothing the flows over the life of the assets (usually +50 years). This is of particular significance in smaller country schemes, which may only receive contributions from occasional development activity.
>
> The Corporation notes instances in country towns with very peculiar pricing outcomes when applying the ERA's current approach. For example, schemes taken over by the Corporation where the existing assets are handed over to the Corporation. Under the current approach, the financial modelling suggests that the Corporation should initially pay the households an income for using the service, but at some point in the future (+10 years) charge all future customers for the assets. This is despite the fact that the assets are handed to the Corporation without charge.
>
> (Water Corporation submission, p52)

Aqwest submits that developer contributions should not be taken into account in determining prices:

> Developer contributions are quarantined for a particular purpose and should not be included in any financial modelling of water utilities. Water utilities should be sustainable and provide a suitable return on assets based on their operational revenue only; i.e. supply fees, consumption charges, etc. (Aqwest submission, p8)

The Department of Treasury and Finance notes some advantages with the current approach:

> In support of the current approach is the fact that it ensures the asset base represents the total value of the company. That said, it also allows the company to earn a rate of return on its gifted assets, which to some degree appears inappropriate given that the company did not invest either its debt or equity into the construction of those assets.
>
> Alternatively, the approach adopted by the New South Wales IPART and the Victorian ESC fails to reflect the full value of the company by excluding the gifted assets from the asset base.
>
> It is understood that the ERA is considering this issue in the context of the electricity industry and the question of appropriate access to Western Power's transmission assets. As there would appear to be a strong case for consistency between the two utility industries, the ERA is requested to consider the matter in this context.
>
> (Department of Treasury and Finance submission, p16)

Assessment

Submissions identified a number of issues with the current treatment of developer contributions.

- Intergenerational inequity (raised by Water Corporation);
- Volatility of tariffs over time (raised by Water Corporation);
- Inappropriate impacts on tariffs when developer contributions are quarantined for future development-related expenditure (raised by Aqwest); and
- The alignment of the asset value with the book value of the company (raised by the Department of Treasury and Finance).

Intergenerational inequity

The Water Corporation's concern with intergenerational equity appears to be that the current treatment of developer contributions benefits current customers more than future

customers. The Water Corporation indicated that its proposed alternative treatment would not have this impact.

Analysis by the Authority shows that both the current and alternative treatments of developer contributions permanently reduce tariffs to existing customers. This can be seen by considering the impact of a new development occurs.

- As the land is being developed, the developer builds the reticulation and pays the Water Corporation for the costs associated with modifications to the wider water network;
- After the land is developed, the developer recovers the costs it has incurred from the purchaser of the land through the sale price;
- The land owner pays the Water Corporation an annual fixed charge, even when the land is vacant; and
- Once water is used, the land owner pays the Water Corporation a usage charge which as discussed above should be linked to the value of that water.

In this instance, the new customer pays all of the costs associated with the network and the value of the water (including the development of new sources). Other direct costs resulting from the new connection, which include meter reading, billing and overheads are unlikely to come to more than $50 per year. However, the total water payment generally incorporates an allowance for other costs (such as for maintenance and replacement of the existing network) that is much higher than $50 per year. The additional revenue received from new customers is used to lower water payments for all customers.

This situation is then complicated by the treatment of developer contributions. Analysis by the Authority shows that the existing treatment of developer contributions tends to initially 'overshoot' the reduction in the fixed charge while the alternative treatment proposed by the Water Corporation tends to "undershoot" the reduction in the fixed charge. For example, using a hypothetical example, the existing approach might cause the fixed charge to immediately reduce from $180 to, say $150 while the alternative approach might cause the fixed charge to immediately reduce to say, $170.

It can be shown that the impact on tariffs is the same under both approaches in present value terms (a fact noted by the Water Corporation in its submission). This means that at some point in the future the fixed charge will be higher under the existing treatment than it would be under the alternative treatment. Continuing the example above, the fixed charge could end up being $170 under the existing treatment while the fixed charge could end up being $160 under the alternative treatment. With perfect foresight, the fixed charge could have been set at $165.[50]

It is unclear whether the existing approach leads to intergenerational inequity. The existing approach certainly provides more of a benefit to existing customers than does the alternative approach. However, this benefit may not cause intergenerational inequity when consideration is given to factors such as preferences for current consumption over future consumption and the generally held proposition that future generations are wealthier than current generations.

[50] This example shows that the existing approach tends to initially result in tariffs that are "too low" by more than the alternative approach results in tariffs that are "too high". It may also be noted that the Authority's current approach to financial modelling for the water businesses involves matching revenue and costs for the period commencing 2005. This approach tends to reduce the differential impacts on tariffs that occurs under the alternative treatments compared to the approach where revenue and costs are matched for future periods only.

The other relevant equity consideration is that the existing approach results in a relatively lower fixed charge for new customers, which reduces the extent of their subsidy to existing customers.

Overall, the Authority does not consider that there is justification to change the developer charges approach on grounds of equity.

Volatility of tariffs over time

Another issue raised by the Water Corporation is that the current approach leads to volatility of tariffs over time. The Water Corporation considers that their proposed alternative approach would remove all of the tariff volatility associated with "lumpy" developer contributions.

As indicated above, the existing approach and the alternative approach have an impact on tariffs, resulting in associated tariff volatility. The current approach to calculating tariffs, which involves calculating a smooth tariff path based on cost data from 2005 until ten years into the future, moderates the volatility. However, this moderation is more effective for large schemes rather than small schemes where development revenue can be a higher proportion of total revenue. The alternative approach does result in less volatility than the existing approach.

The Water Corporation identifies particular problems in small country schemes where developments occur infrequently. Under the existing approach some schemes may have "negative" usage tariffs following a development because the development revenue is greater than the annual costs of providing the service. In such circumstances, an adjustment is made that results in positive tariffs.[51] The Water Corporation's alternative approach would reduce the need for such adjustments although it might still occur where there are large cash contributions.

In addition, the Water Corporation identifies that negative tariffs can also occur when schemes are handed over to the Water Corporation (such as the case of Kambalda). In this situation, the Water Corporation is only incurring the costs of operating the system. Under the existing system, customers would not pay any tariffs for many years.

Overall, there is likely to be a benefit from changing the developer charges approach in order to reduce the volatility of tariffs over time.

Quarantining developer contributions

Aqwest submitted that tariffs should only be calculated with reference to the service provider's own expenditure, and should take no account of cash contributions that have been quarantined in reserves for development-related expenditure.

The Water Boards' approach to quarantining their cash contributions for development-related expenditure differs from the approach taken by the Water Corporation, which uses the cash contributions to fund any capital expenditure.

Over the long term, the current and alternative treatments of cash contributions will have the same impact on tariffs as the method of quarantining developer revenue. However, the quarantining method would require additional oversight to ensure that the quarantined revenue was only used for development-related projects. Otherwise there is a risk that

[51] The adjustment is made by assuming that the scheme has the same proportion of total costs recovered from customers as in all other country schemes.

developers would pay more than necessary (in particular, future developer charges need to take into account the rate of return received on reserves).

The Authority prefers to calculate tariffs by directly accounting for developer revenue (rather than by ignoring it). However, the way in which service providers finance their capital expenditure is not a matter of relevance to the Authority in forming its advice on tariffs.

Alignment with value of company

The Department of Treasury and Finance indicates in its submission that the existing approach more closely aligns the regulatory asset value with the "full" value of the company (i.e. contributed assets are included in the book value).

Under the existing approach the asset value for tariff purposes will be closer to the asset value in the financial accounts. However, it is not necessary for both asset values to be in alignment and generally they will move out of alignment over time. For example, assets can be revalued for financial accounting purposes but are not generally revalued for tariff calculation purposes. Maintaining alignment between regulatory and book asset values is not generally a factor that should influence a decision about the treatment of developer contributions.

A further consideration is that if assets funded by developers are not added to the regulatory asset base, care needs to be taken to ensure that at a later date the asset base is not revalued using a method that estimates the actual physical value of assets (such as the depreciated optimised replacement cost method). If such a revaluation were to occur, it would risk including assets in the regulatory asset base that were funded by developers.

Other matters considered by the Authority

The Authority has undertaken other analysis on the alternative treatments of developer contributions. There are tariff implications associated with the proposed change in the treatment of developer contributions. The Authority estimates that the metropolitan residential fixed charge would be higher by $76 as a result of the proposed change ($220 per year instead of $144 per year).

The Authority has considered whether the initial asset value should be revised as a result of any change to the treatment of developer contributions. The current asset value was set pragmatically to ensure the revenue proposed by the Water Corporation for the ten years commencing in 2005 was the same as had been previously projected by the Water Corporation. The calculation was undertaken by assuming the current treatment of developer contributions. In theory, the asset value would not change if the calculation were able to be undertaken using data that spread across the entire life of the Water Corporation's assets. However, the calculation was based on a period of ten years only. The Authority has revisited this calculation and determined that the asset value ($10,988 million) would have been lower ($9,231 million) if the alternative treatment of developer contributions had been assumed. The lower asset value would have provided the same revenue as projected by the Water Corporation at the time (on the assumption that the alternative approach to developer contributions was applied). However, the Authority also found that if an alternative method had been used to calculate the Water Corporation's initial asset value, the value would have been significantly higher (see section 9.5.3). The Authority therefore does not consider that it would be appropriate to revise the initial asset value on the basis of a change in the treatment of developer contributions.

Another issue considered by the Authority is the impact of the alternative treatments on the financial performance of service providers.

The Authority has identified that the alternative treatment proposed may have negative long term financial implications for the Water Corporation and government (as owner), although it would have positive short-term financial implications. The negative long term financial impact is caused by treating developer contributions for tariff purposes inconsistently with the way developer contributions are treated for tax purposes. Under the Authority's existing approach the tax and tariff treatment of developer contributions are the same (gifted assets are treated as assets and cash contributions are treated as revenue in the year the cash is received).

In considering this issue, it is necessary to understand that tariffs, calculated in present value terms over the life of the assets, are the same under the existing approach and the approach proposed by the Water Corporation. However, there is a difference in when tariff revenue is received. As explained above in the discussion of intergenerational equity, under the existing approach initial tariff revenue tends to be lower than under the alternative approach. Because tariff revenue has to be the same in present value terms, tariff revenue under the existing approach has to be higher at a later stage. Conversely, tariff revenue under the alternative approach is higher initially and lower at a later stage.

Under both approaches the cash requirements to finance capital and operating expenditure are the same. However, under the alternative approach the higher initial tariff revenue increases tax and dividend payments (assuming the dividend payout ratio remains unchanged) and reduces retained earnings. As tariff revenue is reduced at a later stage, but costs are not, the service provider can find itself having to increase its borrowings. Interest payments can then increase and impact on future dividend payments and taxes. To prevent such financial implications the owner would need to reduce its dividends (under the alternative approach).

Another issue considered by the Authority is the administrative complexity of the Water Corporation's option of recognising cash contributions as revenue over the life of the assets. The Authority does not consider this option as appropriate on the grounds that it would be too complex to keep track of the cash flows for each contributed asset, or class of contributed assets.

Conclusion

There are both merits and potential disadvantages in changing the treatment of developer contributions. The merits include the reduction in tariff volatility, particularly for small schemes. The potential disadvantages include the impact on tariffs and the potential long term financial implications for the service provider and owner. The Authority does not consider that there is an argument on intergenerational equity grounds for changing the existing approach.

The Authority has produced its tariff recommendations on the basis that the treatment of developer contributions is changed to the approach recommended by the Water Corporation (excluding gifted assets and offsetting cash contributions from capital expenditure).

Given the significant impact that the change in treatment would have on tariffs, the Authority considers that there should not be any price "shock" to customers. As such, the Water Corporation should be provided with the additional revenue over time (the

additional revenue amounts to $973 million in present value terms).[52] The revenue adjustment could commence following the next regulatory review and the additional revenue could be recovered in a similar manner to the recovery of capital expenditure, over the average life of the Water Corporation's capital expenditure. This approach would result in the Water Corporation receiving the higher revenue over a period of 50 years.

For the Water Boards, no adjustment is required because their tariffs have not been set on the basis of standard regulatory principles. The Authority has calculated tariffs for the Water Boards on the assumption that the alternative approach has been applied from 2005, the date for which the initial asset value is set.

7.5.6 Calculation of Developer Revenue

Background

A matter that was highlighted as part of the Authority's previous analysis of the Water Board's tariffs was their level of developer revenue. In addition, the Authority's was required as part of its Inquiry into Developer Contributions to the Water Corporation in 2008 to develop general principles that could be applied to developer contributions for all government businesses in WA.

The Treasurer advised the Authority in July 2009 that the Government has decided to adopt one of the options for determining developer charges that was evaluated in the Authority's inquiry into developer contributions. Under this approach, developer charges should only be based on the costs of expanding the distribution network and should not include the costs of expanding transmission or source infrastructure.

Following the Government's decision on the approach to determining developer charges, the Authority requested that each of the service providers re-calculate their developer contributions in accordance with the new method.

Assessment

The Authority has received projected developer revenue data from the Water Corporation and the Water Boards, calculated in accordance with the Government's new method for determining developer charges (i.e. based only on the costs of expanding the distribution network). This new data underlies the Authority's recommended tariffs.

7.5.7 Calculation of Community Service Obligations Payments

Background

The calculation of CSOs only pertains to the Water Corporation as Aqwest and Busselton Water do not currently receive CSOs.

At present, the Water Corporation claims CSO payments from the State Government for losses it incurs in providing country services on the basis of a financial model that is aligned with the Water Corporation's asset register and scheme profitability. The financial model is calibrated with the actual total net cost every four years. In the intervening years CSO payments are adjusted for inflation, growth, efficiency targets and changes to

[52] This is the difference in the present value of revenue calculated over the period 2005 to 2018/19 when developer contributions are treated as proposed by the Water Corporation and the when developer contributions are treated as they are currently.

scheme revenue. The efficiency factor, currently 2 per cent per annum, is applied to total expenditure. Furthermore, the CSO is adjusted for the cost of new projects as they are approved by Government.

In addition, the Water Corporation maintains separate financial models for the purpose of calculating CSOs for concessions and infill sewerage.

Payments are made to the Water Corporation by the Department of Treasury and Finance in accordance with delegations from the Treasurer.

Assessment

There are two issues with the current calculation of CSOs. The first issue is that CSOs are calculated using financial models that differ to the model used to calculate tariffs. At present the Government makes decisions on projects that have CSO implications by having regard, amongst other things, to information from the Water Corporation's CSO model. The CSOs calculated from this model assume the existing projected level of tariffs. However, these tariffs will change as a result of the project going ahead and therefore the CSO will change. A model that determines tariffs and CSOs simultaneously can provide the Government with more accurate information on the CSO consequences of a particular decision.

In addition, there would not seem to be any reason to maintain more than one financial model where each has the same purpose: to ensure Water Corporation recovers any costs that are efficiently incurred (including a return on efficiently incurred capital expenditure). The monitoring costs incurred by the Department of Treasury and Finance would be saved if the financial model used to calculate tariffs were also used to calculate CSOs. Further, the calculation of tariffs would no longer need to account for any over or under-recovery of CSO revenue resulting from inconsistencies between the current financial models.

The second issue is that CSOs are set on an annual basis (although they are recalibrated on a four-yearly basis). If tariffs are to be set for a three year regulatory period, it may also be appropriate to set the Water Corporation's CSO revenue over the same period. CSOs are payments that are generally made in lieu of the Water Corporation receiving higher tariffs from its customers. CSOs can therefore be calculated as the difference between costs incurred by the Water Corporation and payments received from customers.

To address these issues, the Authority recommended in its draft report that CSOs and tariffs should be calculated using the same financial model and that CSOs should be set for a three year period. However, the Water Corporation did not support this draft recommendation, on the basis that the determination of the CSO payment is a complex process involving numerous models, annual submissions and quarterly updates to Government, and annual adjustments for differences between actual and forecast costs. The Water Corporation maintained that this could not be achieved through a single financial model, and that the transparency of the current CSO process would be lost.

The Department of Treasury and Finance submitted that setting the CSO payment every three years rather than annually would remove the flexibility required by the Government to deliver on its non-commercial policy objectives. The Department also noted an imminent review of CSO policy and CSO payments.

The Authority accepts that any proposed changes to the process for setting CSOs would be best considered within the forthcoming government review of CSOs policy. However, the Authority considers that government decision making would be better informed if the

CSO consequences of a project proposal were calculated by the Water Corporation using the Authority's tariff model.

The Authority also considers that setting the Water Corporation's CSO revenue for a three year period would not have any financial consequences for the Water Corporation. Any decisions made between regulatory reviews that have CSO implications would be adjusted for at the regulatory review.

The Authority's recommendation that CSO revenue be set for a three year period is not intended to remove any flexibility for the Government in making decisions that have CSO implications. It is expected that these decisions would continue to be made as required. However, under the Authority's recommendation, the Water Corporation's revenue would not be adjusted until the next regulatory period.

Another submission, by the WA Council of Social Service (WACOSS), recommended that there be a centralised unit for the processing of rebates and concessions. The Authority notes that this is another matter which could be considered as part of the government's review of CSOs.

8 Operating and Capital Costs of Providing Services

8.1 Terms of Reference

This section addresses the following specific issue referred to in the Terms of Reference:

- the operating and capital costs of providing services, with a focus on:
  - cost effectiveness in the supply of services; and
  - resources necessary to meet the required service standards.

8.2 Recommendations

Recommendations

29) Water Corporation's revenue requirement be set on the basis of reductions in base real operating costs per connection of 1.88 per cent per year.

30) Water Corporation's revenue requirement be set on the basis of its projected increases in operating costs to achieve level of service improvements.

31) Water Corporation's revenue requirement be set on the basis of its capital expenditure projections.

32) Customers should not pay for any premium associated with the Water Corporation's strategy to procure up to 20 per cent of the energy requirements of the Southern Seawater Desalination Plant from renewable energy sources that are untested at a commercial scale.

33) Aqwest's and Busselton Water's revenue requirements be set on the basis of their operating and capital expenditure projections.

8.3 Reasons

The Authority considers that Water Corporation should be set the same target level as currently applies for operating expenditure efficiency gains on its base level of expenditure. Aqwest and Busselton Water's operations are considered too small to apply an explicit efficiency target. An appropriate level of efficiency gain is being targeted by the Water Boards.

In relation to the Water Corporation's operating expenditure associated with improving levels of service, the Authority is concerned that a full analysis could not be undertaken due to the lack of information on similar expenditure included in base operating costs. Notwithstanding this constraint, the Authority has identified cost savings that are small in relation to the total planned operating expenditure ($18 million compared to $2 billion over the period 2009/10 to 2012/13). The Authority has accepted the Water Corporation's

proposed operating expenditure for the purpose of setting tariffs for the regulatory period. However, at the next regulatory review, the Authority would expect information to be available in a form that would permit a full analysis of proposals to increase level of service expenditure.

The Water Corporation's planning and prioritisation processes provide confidence that it has appropriate processes in place to guide capital expenditure decisions. A review of five of the Water Corporation's largest capital expenditure projects indicated that the Water Corporation's expenditure was, in general, justified. As such, the Authority has accepted the Water Corporation's projections of capital expenditure.

The Authority has a particular concern with the Water Corporation's approach to procuring energy for the Southern Seawater Desalination Plant from renewable energy sources that are untested at a commercial scale. The Authority does not consider that customers should pay for any premium resulting from this procurement approach.

The Authority did not find any inappropriate expenditure in the capital expenditure programs planned by the Water Boards.

8.4 Introduction

The Authority has addressed the Terms of Reference by considering the following issues:

- Resources necessary to meet service standards.
- Appropriateness of demand projections.
- Scope for operating expenditure efficiency gains.
- Prudency of capital expenditure.

8.5 Resources Necessary to Meet Service Standards

8.5.1 Background

Licence conditions are implemented to ensure certain public health and safety standards are achieved. In addition, licence conditions are implemented to ensure customers receive a prescribed level of service.

The need to mandate service standards is a result of the monopoly nature of the businesses. No effective market exists for the products or services provided by these businesses, and as a result, customers are unable to choose an alternative provider offering a different level of service. As such, the businesses do not face any pressure from competitors to offer appropriate levels of service that meet customer expectations and for which they are willing to pay.

Compliance with the terms and conditions of operating licences results in associated costs. Prices should be set at a level sufficient to ensure that the legitimately incurred costs (for achieving the required levels of service) are recovered.

The Terms of Reference for this current inquiry require the Authority to consider whether the utilities have sufficient resources to meet the required levels of service.

8.5.2 Assessment

The submissions to the inquiry highlight several issues regarding service standards:

- concerns about existing standards;
- performance by the service providers in meeting existing service standards; and
- the absence of a Code of Conduct and a Water Industry Ombudsman.

Concerns About Existing Standards

WACOSS raised concerns about current practices by the water businesses and recommended improved service standards in a number of areas.

> WACOSS believes that the existing service standards do not reflect the needs or priorities of the majority of customers that are on low incomes or experiencing disadvantage in Western Australia. (WACOSS submission on Issues Paper, p5)

WACOSS' concerns relate to debt management practices, including the use of supply restrictions and high interest rates, or the removal of eligibility of concessions, in cases where customers have not paid their accounts. Another issue raised by WACOSS was the levels of service in remote communities. These matters are not reviewed in operational audits as operating licences do not currently contain any service standards relating to these matters.

The issues raised by WACOSS are discussed in turn.

(1) Restriction of Water Supply

In response to unpaid accounts, the Water Corporation, Aqwest and Busselton Water currently restrict water flow rates (to a level of flow sufficient for health and hygiene purposes).[53] The conditions under which the Water Corporation will restrict or restore water supply are set out in its Customer Charter. The Water Corporation has placed a moratorium on water supply restrictions in September 2008, although this is due to be lifted in July 2009.[54]

The water businesses' powers to restrict water supply are conferred by their respective legislation. The rights of the Corporation to restrict the supply of water are conferred by the *Metropolitan Water, Sewerage and Drainage Act 1909* (section 41).[55] The *Water Boards Act 1904* (section 60) allows for the water boards to cease or reduce flow rates if accounts are unpaid. Aqwest's Customer Service Charter notes the possibility of restrictions in the event of unpaid accounts.

The National Water Commission (2008) National Performance Report for Urban Water Utilities lists the number of customers to which restrictions were applied due to non-

[53] In the case of the Water Corporation, water flows may be restricted from a flow rate of at least 20 litres per minute to a rate of 2.3 litres per minute.

[54] The Water Corporation has been a participant in the Hardship Utilities Grants Scheme (HUGS) from April 2009, an aspect of which is that it protects customers in hardship from having their water supply restricted. The moratorium on water supply restrictions was put in place to ensure that customers are not disadvantaged by not being able to access HUGS for their water bills.

[55] Under sections 41(1)(b and c) of the *Metropolitan Water Supply, Sewerage and Drainage Act 1909,* "the Corporation may turn or cut off or reduce the available rate of flow of the water supply to any land when any water supply charges remain unpaid for 30 days after they become due; or when any person refuses or neglects, after demand, to pay all water supply charges due and payable by that person to the Corporation."

payment of accounts in 2007-08 at 1,405 for the Water Corporation, 23 for Aqwest and 67 for Busselton Water.

WACOSS submitted that:

> The enforcement of restricted flow as a debt management strategy has various impacts upon households, including (but not limited to) health and hygiene issues, social exclusion, and disruption to school participation for children….Emergency Relief agencies report that families with restricted supply have insufficient water for bathing or laundering.[56] As a consequence, children may be reluctant to attend school for fear of being stigmatised, and in some cases children have been removed from school all together due to poor hygiene.[57] (WACOSS submission on Draft Report, p12)

WACOSS expressed concern about the number of people subject to water supply restrictions by the three service providers, and recommended that restriction of water supply be banned, as it is in the United Kingdom.

The decision on whether to ban the restriction of water supply is a matter for government. This issue would warrant further consideration as part of the development of any code of conduct for the water industry. The policy on restrictions could also be set out within the licence conditions of water service providers. If service standards are to be reviewed as part of future price inquiries by the Authority, this policy would be examined within such a review.

(2) Conditions for Concession Eligibility

The rights by which the Water Corporation can set the conditions for eligibility for concessions are established under the *Rates and Charges (Rebates and Deferments) Act 1992* (section 40). One of the conditions for eligibility for Water Corporation concessions is that customers must have paid their annual service charge and any arrears before the end of the financial year.

WACOSS called for an immediate cessation of this policy, recommending that concession entitlements be passed on to customers in all circumstances, and that financial hardship policies be used to address non-payment of annual service charges or arrears on accounts. WACOSS submitted that:

> Concessions are designed to assist customers on low incomes to manage their utility accounts. If a customer has not paid their annual service charge or has arrears, it is likely that they are having financial difficulty. Withdrawing a customer's concession entitlement places further pressure on them financially and is contradictory to the actual purpose of the concession. (WACOSS submission on Draft Report, p14)

The Authority notes that it is for government to decide as to whether making eligibility for concessions contingent upon the settlement of accounts by the end of the financial year should be allowed. Any changes to the *Rates and Charges (Rebates and Deferments) Act 1992* would need to be referred to the Treasurer, who administers that Act.

(3) Higher Interest Rates on Debt

The interest rates levied by the Water Corporation on outstanding accounts are set by Government and published on an annual basis in the water charges by-laws. Currently, the interest rate on overdue amounts is 13.99 per cent per annum.[58] The Water

[56] "Would you like a bit of heat with that trickle of water?", WACOSS, 2003.

[57] Ibid.

[58] *Water Agencies (Charges) By-laws 1987*, Schedule 7(5) – Interest on overdue amounts (by-law 9).

Corporation publishes a Debt Recovery Code of Practice, which sets out the Corporation's billing practices and debt recovery process.[59] The higher interest rates on outstanding accounts may be waived in some circumstances (e.g. if customers negotiate alternative payment arrangements with the Corporation, cases of financial hardship, or if the customers are pensioners).[60]

Aqwest and Busselton Water also charge higher rates of interest on overdue accounts (10 and 12 per cent per annum, respectively).

The Authority notes that electricity retailers may charge higher interest rates on outstanding accounts, in accordance with electricity retail by-laws.[61] By comparison, Synergy may charge customers with outstanding accounts above $1,000 a higher interest rate (currently set at 9 per cent per annum). However, as a policy Synergy does not charge interest on overdue amounts for small use customers.

WACOSS submitted that the application of higher interest rates on overdue accounts places an additional financial burden on customers who may be experiencing financial hardship, and recommended that the policy be discontinued in the interest of fairness and equity.[62]

The additional charges on outstanding accounts are commercially justifiable if they reflect the associated additional costs incurred by the business. The Authority has examined the cost reflectivity of the interest rate charges by the Water Corporation as part of its assessment of the Corporation's non-standard tariffs (see section 6.4.1) The Authority concluded that the rates of interest on overdue accounts charged by the Corporation appeared high relative to other government businesses and water agencies, and recommends a rate of 9.24 per cent. The Authority considers that it is also important that mechanisms continue to be developed to minimise the impact of higher interest charges and incidence of outstanding payments, for customers who are experiencing financial hardship.

(4) Levels of Service in Remote Communities

WACOSS submitted that service standards in rural and remote communities were often not met.

> [A]ppropriate water quality and service in rural and remote Aboriginal communities is not being achieved. WACOSS firmly asserts that more effort needs to be placed in addressing these issues. (WACOSS submission on Issues Paper, p6)

WACOSS recommended that service standards be improved to include an "increased awareness of issues around access to water in rural and remote Aboriginal communities and significant improvement of water quality and service in these communities".[63]

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[59] The Water Corporation's Debt Recovery Code of Practice includes information on billing (where accounts are sent, how often meters are read, how often and to whom accounts are sent, concession eligibility); payment methods; provisions for financial hardship (processes for agreeing alternative payment arrangements, including deferment of payments; eligibility for financial assistance); and processes in the event of unpaid accounts (including restriction of water supply and legal action).

[60] On 25 February 2009, there were 68,752 outstanding accounts for Water Corporation's residential customers. Interest rates were reduced or waived for 14,441 of these accounts. Of the 5,166 overdue commercial accounts on this date, interest rates were reduced or waived for 905 customers.

[61] *Energy Operators (Electricity Retailers Corporation) (Charges) 2006) by-laws*

[62] WACOSS submission on Draft Report, p13.

[63] WACOSS submission on Issues Paper, p5.

The Water Corporation's licence, which is regulated by the Authority, covers a number of remote communities.[64] In these communities, the service standards in the licence apply unless an exemption from all or part of the standards has been granted.

However, many remote communities are outside the water services controlled areas and are not licensed by the Authority. The performance standards for these remote communities are regulated by government rather than the Authority.

Meeting Existing Standards

The Authority issues licences to water and wastewater service providers, sets the licence conditions and monitors the performance of service providers against their licence conditions. Performance management is on an annual basis, and service providers are required under legislation to carry out operational audits and asset management reviews at least every two years unless the Authority determines otherwise, which are reviewed by the Authority. The Authority has powers to enforce compliance with operating licence conditions.

The Water Corporation and Aqwest submitted that the service standards to which they operate are set out within their operating licences, and that these service standards have been met.

The most recent operational audits for the Water Corporation, Aqwest and Busselton Water, published on the Authority's web site, show that each of the service providers is compliant with the conditions of their operating licence.

None of the service providers indicated a need for additional expenditure to improve on existing service standards on the basis of customer demands.

Code of Conduct and Water Industry Ombudsman

WACOSS recommended the introduction in legislation of a customer services code, along with a code of conduct, enforceable by a Water Services Ombudsman.

> WACOSS provides its strong support for the implementation of enforceable codes, as currently exists for the energy sector. Great need exists for a legislative customer service code with a strong focus on issues of consumer protection.
>
> WACOSS also strongly supports the formation of a Water Services Ombudsman to assist in the enforcement of a code of conduct and to promote, by compulsion if necessary, the resolution of complaints against a provider subject to the scheme.
>
> WACOSS asserts that a Code of Conduct for Water Services and a Water Services Ombudsman Scheme must allow access to tenants, to ensure that this already vulnerable group of water consumers are provided with the same consumer protection measures as other water services customers.
>
> (WACOSS submission on Draft Report, p14)

Introducing a Code of Conduct in the water services sector would bring the water sector in line with current arrangements in the electricity sector, where there is a code of conduct for small use customers, as well as formal regulations on codes of conduct and customer

[64] The Water Corporation offers subsidised water and wastewater service and usage charges to residents of around 30 communities classed as "community residential", which are essentially remote indigenous communities. The discounts are equivalent to pensioner and senior citizen discounts. See section 6 on Water Corporation's Other Tariffs for discussion.

contracts, under the *Electricity Industry Act 2004*.[65] In the gas sector, since 1 July 2009, the *Compendium of Gas Customer Licence Conditions* (also known as the Gas Customer Code 2008) provides consumer protection for gas customers commensurate with the code of conduct for the supply of electricity to small use customers.

Similarly, the establishment of a Water Industry Ombudsman would reflect the arrangements currently in place in the electricity and gas sectors, which have an Energy Ombudsman. The Energy Ombudsman handles complaints from residential and small business customers about their electricity or gas company, including billing disputes.

8.6 Appropriateness of Demand Projections

8.6.1 Demand Projections by Service Providers

Background

The service providers have assumed that the growth in the number of customers across their services is as provided in Table 8.1. The same growth assumptions are generally applied to residential and non-residential customers (with the exception of Busselton Water which apply different growth assumptions).

Table 8.1 Growth in Number of Residential and Non-residential Customers, as Projected by Water Corporation, Aqwest and Busselton Water (Per cent, Year Ending 30 June)

	2010	2011	2012	2013
Water Corporation – Metro				
Water	2.4	2.4	2.4	2.4
Wastewater	2.7	2.7	2.7	2.7
Drainage	1.6	1.6	1.6	1.6
Water Corporation – Country (weighted average)				
Water	3.2	3.1	3.2	3.2
Wastewater	4.4	4.3	4.5	4.2
Aqwest				
Water	4.1	2.0	2.0	2.0
Busselton Water				
Water	2.3	3.3	4.1	3.9

Source: Water Corporation, Aqwest and Busselton Water

[65] *Code of Conduct (For the Supply of Electricity to Small Use Customers); Electricity Industry (Code of Conduct) Regulations 2005; Electricity Industry (Customer Contracts) Regulations 2005.* There are also other regulations in electricity regarding licence conditions, licensing fees, the obligation to connect and network quality and reliability of supply: *Electricity Industry (Licence Conditions) Regulations 2005; Electricity Industry (Licensing Fees) Regulations 2005; Electricity Industry (Obligation To Connect) Regulations 2005; and Electricity Industry (Network Quality and Reliability of Supply) Code 2005*

Water Corporation has advised that it uses the following method for forecasting growth in customer numbers:

> The Water Corporation conducts a "bottom-up" approach to forecasting property growth numbers, based on the following process:
>
> 1) When approved, a Land Developer in Western Australia is given a 4-year window by government in which to develop their intended number of lots, before the approval expires;
>
> 2) The Water Corporation is advised of the location, the services required (i.e. water, wastewater, drainage) and the maximum number of lots the Land Developer is approved to develop;
>
> 3) Based on historical averages and location specific factors, the Water Corporation makes an estimation about the proportion of lots that will be developed by a Land Developer in each year within their 4-year window. Information from all the individual Land Developers in then collated into a total lot creation forecast;
>
> 4) Historically, the Water Corporation has cross-checked the lot creation forecasts against the Department of Planning & Infrastructure's (DPI) "Metropolitan Development Plan" and "Country Areas Development Plan", together with forecasts provided by BIS Shrapnel. However, the DPI has recently ceased publishing their reports. Information from the DPI was conducted based on a rough survey of Land Developers' intentions;
>
> 5) The 5th year of the forecast is conducted based on extrapolation of data from the 4-year forecasts using economic forecasts provided by BIS Shrapnel as a guide;
>
> 6) Information from the infill sewerage program is added to the land developer information for wastewater forecasts.
>
> Overall, using this "bottom-up" approach, the Corporation has been able to forecast overall property growth within a close degree of accuracy (particularly for the metropolitan region). In a typical year, the Corporation's forecasts are within 0% - 0.5% of the actual year-end figure. Only at the peak of the West Australian economic boom in 2006/07 (the strength of which surprised the majority of the world's leading economic forecasters) were the actual property growth figures not within 0.5%.[66]

The growth in volume is generally derived by assuming that existing usage per customer remains constant. The usage per customer for each service is provided in Table 8.2.

[66] Email from Water Corporation, 9 March 2009.

Table 8.2 Usage per Customer, as Assumed by Water Corporation, Aqwest and Busselton Water

	Residential	Non-residential
Water Corporation - Metro		
Water	265 kL/user	775 kL/user
Wastewater	Not applicable (there is no usage charge)	358 kL/user
Water Corporation – Country (weighted average)		
Water	300 kL/user	1,252 kL/user
Wastewater	Not applicable (there is no usage charge)	266 kL/user
Aqwest		
Water	257 kL/user	835 kL/user
Busselton Water		
Water	285 – 301 kL/user	922 - 929 kL/user

Source: Water Corporation, Aqwest and Busselton Water

The Water Corporation has advised that specific adjustments are made when forecasting volumes using usage per customer.:

- Atypical weather. Forecasts are not based on the previous year's actual volumes, but rather a "normalised" year that aims to average out past per capita consumption recognising particularly hot or mild weather occurrences.
- Impact of any tariff reforms. For example, to account for the gradual role out of wastewater volumetric charges for country schemes.
- Projected impact of demand management initiatives. For example, adjustment was made this year to projected country volumes following the Government's suite of water efficiency initiatives that were introduced state-wide last summer.[67]

Assessment

The Authority engaged Economic Research Associates to review the appropriateness of the Water Corporation's demand projections (the consultant's report is available on the Authority web site).

The consultant found that the Water Corporation's demand forecasting methods are:

> Broadly in line with methodologies used elsewhere and recommended for water demand forecasting elsewhere. The role of price in assessing demand over the forecast period is minimal although given the relative price insensitivity of demand, this is not likely to be significant in terms of accuracy.
>
> Typically these forecasts are within 2 per cent of actual for water demand and within 1 per cent for drainage and wastewater.

The Authority has accepted the demand forecasts for the Water Corporation, Aqwest and Busselton Water for the purpose of calculating recommended tariffs for the regulatory period.

[67] Email from Water Corporation, 9 March 2009.

8.7 Scope for Operating Expenditure Efficiency Gains

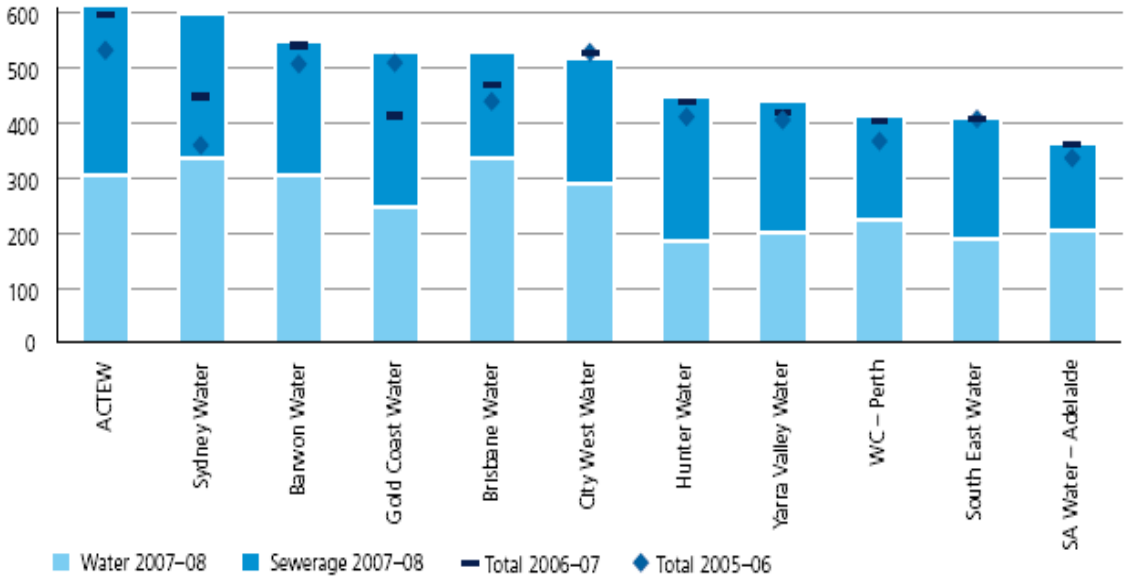
8.7.1 Background

Operating costs cover all expenditure related to the overall operation of the business and include water and wastewater treatment plant operation (e.g. power, chemicals, labour, materials), plant and equipment, administration, salaries, contracted services and overheads.

The Authority notes that operating costs per property for the three water utilities are comparatively low. Figure 8.1 shows that Water Corporation's Perth operations have a total operating cost per property that is lower than the costs of the other large water utilities except for South East Water and SA Water. Figure 8.2 shows that AQWEST and Busselton Water have total operating costs for water per property that are in the middle when compared to water utilities of a similar size.

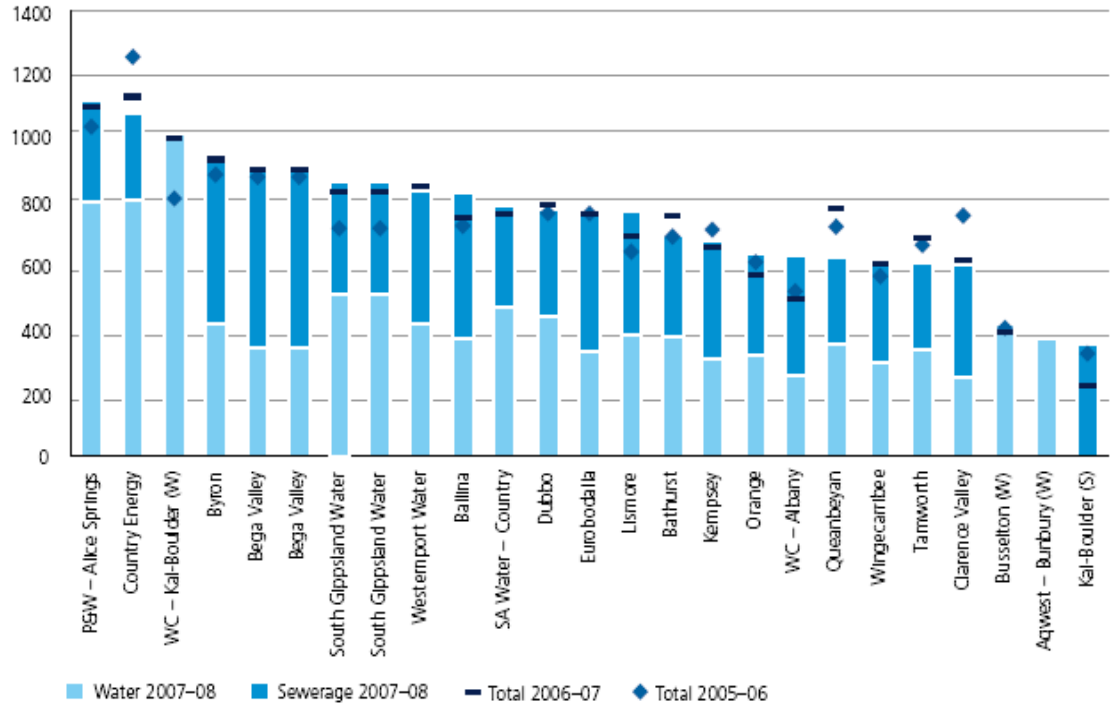
In presenting these figures, the Authority recognises that the use of benchmarking can be problematic: the number of suitable comparator businesses in Australia is small, and difficulties arise in determining whether differences in operating cost performance between businesses are due to different efficiencies, or could be explained by other factors (e.g., geography, demography, hydrology, climate, technology, social factors).

Figure 8.1 Operating Costs for Water and Sewerage Services ($ per Property) in 2007-08 – Service Providers with 100,000 Customers or More



Source: Water Services Association of Australia Ltd, National Water Commission and NWI Parties (2009), National Performance Report 2007-2008: Urban Water Utilities.

Figure 8.2 Operating Costs for Water and Sewerage Services ($ per Property) in 2007-08 – Service Providers with 10,000 to 20,000 Customers



Source: Water Services Association of Australia Ltd, National Water Commission and NWI Parties (2009), National Performance Report 2007-2008: Urban Water Utilities.

8.7.2 Submissions

Department of Treasury and Finance

The application of efficiency targets to government owned service providers that reflect the conditions of a privately owned entity, in a competitively neutral manner, is supported. Issues to consider in the application of incentives to public corporations include the following:

- the attitude of the Board of the Corporation in its approach to balancing its dual objectives of profit maximisation and the provision of a retail service on behalf of the Government;
- the existing efficiencies of the Corporation and the scope for any further gains;
- the level of cost recovery versus the use of direct subsidies and whether there are any price based efficiency incentives that may be applicable; and
- the governance arrangements of the corporations and the scope of the Board to make commercial decisions without being 'weighed down' with the obligation to deliver on the Government's social policy agenda, especially if there are cross-subsidies between the commercial and non-commercial streams of the business.

(Department of Treasury and Finance submission, p14)

8.7.3 Assessment

For each service provider, the Authority engaged Halcrow Pacific to:

- compare actual operating expenditure (since the 2005 pricing inquiry) to the projected operating expenditure and to investigate the reasons for any substantial differences between projected and actual expenditures, and
- examine projected operating expenditure, cost drivers and processes, and determine the scope for efficiency gains in comparison to past performance and other service providers.

A copy of Halcrow Pacific's report is available on the Authority's web site. The following sections discuss each service provider in turn.

Water Corporation

Background

Following the 2005 Inquiry, the Government decided that the Water Corporation's tariffs would be set in accordance with an assumption that Water Corporation would achieve reductions in base operating costs per connection of 1.88 per cent per year (in real terms) for the period from 2004/05 to 2008/09. Base operating costs per connection are the operating costs associated with continuing to provide the average level of service to customers that was provided in 2004/05.

In addition, the Water Corporation was to be compensated (via tariffs) for any operating expenditure required to increase their level of service above 2004/05 levels, as required by customers and regulators. Operating expenditure required by government to meet social objectives was to be funded by a Community Service Obligation payment.

Historical operating expenditure

Typically, regulators would not consider historical operating expenditure at a regulatory review; there would be no ability to "claw-back" any inefficient past operating expenditure (by reducing tariffs in the future). Instead, regulators would only consider future operating expenditure, which would be used to set allowable revenue, and therefore tariffs, for a regulatory period.

The existing arrangement is that the Water Corporation's costs and revenue would balance for the period commencing July 2005. In effect, this approach has removed any demand risk from the Water Corporation (e.g. any increase in costs associated with meeting unexpected demand would be paid for by customers). However, this approach does provide for a review of historical operating expenditure.

Halcrow Pacific focused their analysis on the appropriateness of operating expenditure spent on providing level of service improvements. In comparison to base operating expenditure, which was estimated at $593 million in 2008/09, expenditure to provide level of service improvements above the 2004/05 level was estimated at $108 million.

The Water Corporation submitted that the operating expenditure shown in Table 8.3 was incurred over the period 2005/06 to 2008/09 to achieve level of service improvements over an above the level of service provided in 2004/05.

- Desalination-related expenditure – which is source development expenditure that was not planned for in 2004/05.

- Compliance with regulatory standards that existed in 2004/05 and was planned for – e.g. rolling out the drinking water quality program in the country.
- Compliance with regulatory standards that existed in 2004/05 but was unforeseen – due to changes in regulations by health, environmental or economic regulators.
- Non-regulated activities with associated revenue – typically commercial activities for which operating costs are incurred and revenue received and their would be no financial impact on regulated customers.
- Government program with associated CSO revenue – e.g. the uniform tariff policy which is fully funded by a CSO.
- Government program without associated CSO revenue – e.g. using renewable sources to power the desalination plants.
- Water Corporation initiatives – programs the Water Corporation has initiated because it considers there will be a benefit to customers.

Table 8.3 Historical Expenditure Claimed by the Water Corporation to Provide Level of Service Improvements ($,000, Nominal, Year Ending 30 June)

Type of Operating Cost	2005/06	2006/07	2007/08	2008/09
Perth Seawater Desalination Plant	0	5,601	24,146	24,807
Level of service operating costs associated with new capital expenditure	475	87	3,984	7,784
Compliance with regulatory standards that existed in 2004/05 – foreseen expenditure	0	2,870	4,647	20,786
Compliance with regulatory standards that existed in 2004/05 – unforeseen expenditure	808	9,599	3,254	17,574
Non-regulated activities (with associated revenue)	0	6,953	11,964	18,144
Government program (with associated CSO revenue)	0	184	586	904
Government program (without associated CSO revenue)	0	0	10,000	0
Water Corporation Initiatives	1,100	8,927	10,710	18,003
Total	**2,383**	**34,221**	**69,291**	**108,002**

Source: Water Corporation

Table 8.3 shows that of the $214 million (in level of service related operating expenditure) incurred in total over the four years, approximately $28 million of which was foreseen expenditure associated with complying with regulatory standards that existed in 2004/05. The rest of the expenditure was unforeseen. The largest unforeseen expenditure was on the Perth Seawater Desalination Plant (almost $55 million over the four years). $31 million was spent unexpectedly in complying with the standards that existed in 2004/05. Almost $39 million in total was spent on Water Corporation initiatives such as water mains cleaning and projects related to the water cycle, sustainability strategy and climate response.

Projected operating expenditure

The issues that require analysis in relation to projected operating expenditure are the efficiency target that should apply to the Water Corporation's base operating expenditure per connection, and the provision for a future increase in the level of service.

Operating efficiency target

The Authority received the following submission from the Water Corporation.

> The Corporation has remained focused on the 2% per annum operating efficiency target and continues to do so in the short term. In saying this however, there is some evidence that maintaining this target is impacting on the Corporation's ability to continue to deliver services efficiently in the medium to long term and there is a limited ability to sustain these tight efficiency targets indefinitely. A revision to the target may be warranted to ensure the Corporation maintains its ability to deliver the high standard of service expected of it. (Water Corporation submission, p2)
>
> Since 2005/06 the Corporation has adopted an annual operating efficiency target of 2%. This figure represented a midpoint between the efficient expenditure target of 1.6% identified by the Corporation under its Process Improvement Program and the 2.4% recommended by the ERA in its 2005 review. In achieving this target, the Corporation notes that:
>
> - Typically, large utilities generate some of their efficiencies from the increasing scale of their operations (economies of scale). While this is also true of the Corporation, these opportunities have been limited in recent years due to the magnitude of the growth associated with the mining boom. Furthermore, the nature of ever increasing regulation plus the gradual elimination of "cheap" new sources places added cost pressures on projects primarily driven by growth.
> - Much of the Corporation's actual efficiencies have been generated from a focus on continuous improvement and a general 0.5% efficiency which has been forced onto all areas of the business, with the expectation that area managers must continually seek ways to reduce the cost of their service. Examples of efficiencies from its continuous improvement include the Centralised Operations Centre, e-procurement system and the effective renegotiation of the energy supply contract. While the Corporation continues to pursue such opportunities, their availability becomes increasingly limited.
> - Reductions in discretionary initiatives. The Corporation is expected to undertake various initiatives, which while not necessary for the immediate delivery of service improvements, are nonetheless required to efficiently and effectively manage the business in the longer term. These initiatives are required to maintain "organisation capacity". Examples include water main asset condition inspections and alternative source development & catchment management practices. Continuing to meet the 2% target has driven the Corporation to significantly reduce the funding of this discretionary expenditure. The ability to continue to do this in the future is limited.
>
> While the Corporation continues to target a 2% efficiency target, there are difficulties in maintaining this into the future. There is little motivation to meet an "efficiency target" if it begins to compromise the high service standards currently being delivered.
>
> The issues paper recognises the distinction between catch-up and continuing efficiency, with the Corporation considering its efficiency gains from past endeavours placing it beyond the efficient frontier. Additional cost cutting will impact on the Corporation's ability to effectively manage its business and deliver the required level of service. Accordingly, a revision to the 2% target that removes (or reduces) the "catch-up" element of the target may appear to be warranted. Either that, or recognition that the 2% should only be applied to the controllable elements of the organisation. As part of this inquiry, the Corporation is

considering its position and operating cost requirements. (Water Corporation submission, p24-25)

Halcrow Pacific's advice was that the current operating efficiency target should continue to apply to the Water Corporation's base operating costs. In arriving at this conclusion, Halcrow Pacific considered:

- the Water Corporation's experience in achieving the operating efficiency target in the past;
- the operating processes that the Water Corporation has in place to prioritise operating expenditure;
- the targets being applied to comparable service providers; and
- the impact of the target on the Water Corporation's operations.

Over the period from 2005/06 to 2007/08, actual total operating expenditure incurred by the Water Corporation was close to that agreed to by government following the 2005 inquiry (the variance was less than one per cent). This target was achieved despite the Water Corporation experiencing increased operating expenditure (associated with additional projects), higher than expected cost escalation and unexpected expenditure on level of service improvements.

Halcrow Pacific raised a number of issues for the Water Corporation's attention, including the variability in the standard of operating funding requests across divisions and the level of information provided for the macro budget process.

In considering the efficiency targets applying to comparable service providers, Halcrow Pacific considered regulatory decisions in other jurisdictions.

- The Independent Pricing and Regulatory Tribunal in New South Wales has applied an efficiency target of 1.8 per cent to Sydney Water in a recent price determination (this efficiency target applies to Sydney Water's controllable costs in a similar way to the current target to the Water Corporation applies to base operating costs).
- The Essential Services Commission in Victoria expects water businesses to be able to demonstrate an average annual productivity improvement of 1.0 per cent per annum on business as usual expenditure (i.e. after adjusting for growth).

Halcrow Pacific advised that an efficiency target (reducing base real operating expenditure per connection) of 1.88 per cent per year was appropriate for the Water Corporation).

Level of service projections

The categories of operating expenditure required to achieve higher levels of service for the next regulatory period are provided in Table 8.4

Table 8.4 Expenditure Claimed by the Water Corporation to Provide Level of Service Improvements for the Period 2009/10 to 2012/13 ($,000, Nominal, Year Ending 30 June)

Type of operating cost	2009/10	2010/11	2011/12	2012/13
Perth Seawater Desalination Plant	25,489	26,193	26,920	27,669
Southern Seawater Desalination Plant (SSDP)	0	686	23,386	33,731
SSDP – Renewable Energy Premium	0	0	11,000	11,352
Level of service operating costs associated with new capital expenditure	9,735	11,007	14,028	27,940
Compliance with regulatory standards that existed in 2004/05 – foreseen expenditure	24,545	20,348	20,169	20,506
Compliance with regulatory standards that existed in 2004/05 – unforeseen expenditure	3,150	3,205	3,350	3,451
Non-regulated activities (with associated revenue)	18,628	18,306	19,378	25,491
Government program (with associated CSO revenue)	968	970	975	975
Government program (without associated CSO revenue)	18,600	8,400	0	0
Water Corporation Initiatives	27,782	36,984	39,901	44,747
Total	**128,897**	**126,099**	**159,105**	**195,862**

Source: Water Corporation

Table 8.4 shows that the most significant expenditure is due to desalination projects, new capital expenditure and Water Corporation initiatives. The operating costs (associated with desalination and other capital expenditure) are appropriate as long as the expenditure is efficiently incurred and not related to growth (the base operating expenditure, for which efficiency target applies, accounts for growth-related operating expenditure). The operating costs associated with Water Corporation initiatives ($149 million in total over the four years) are relatively large and includes a range of projects. All figures quoted below are for total expenditure over the period 2009/10 to 2012/13.

- Asset Condition Assessment Gap Treatment Management Program, which seeks to improve asset management to reduce levels of asset failures and disruptions to customers ($43.5 million).
- Backflow prevention, to improve the level of protection to the Water Corporation's assets from backflow from customers' operations for all new and redeveloped commercial and industrial customers ($23 million).
- Water Cycle Strategy, which is intended to increase the management and planning of the Water Corporation's non-drinking water service ($9 million).

In undertaking the review of the Water Corporation's major level of service operating expenditure, Halcrow Pacific commented that:

> In general, we have not been able to make specific comments on whether operating expenditure increases proposed by the Water Corporation could be funded out of the

existing base operating expenditure. The reason for this is that the Water Corporation has been generally unable to provide details of the base operating expenditure related to the specific projects we have reviewed.

Halcrow had particular concerns about two projects:

- "Water Cycle" Strategy. Halcrow Pacific noted that they did not receive "any supporting information indicating that this funding request relates to new expenditure which is not already included in the base operating expenditure". Halcrow Pacific recommended a reduction of $11 million over the regulator period.
- Provision for capital expensing. Halcrow Pacific found the Corporation's capital planning processes to be robust; and if properly implemented there would only be a limited number of incomplete capital projects. As such, Halcrow Pacific expected that the provisions allowed for capital expensing should be decreasing over time (a reduction of $7 million over the regulatory period was recommended).

In addition, Haclrow Pacific Water noted that the Water Corporation is currently preparing a business case for a Water Efficiency Program, which is anticipated to cost approximately $13 million over the regulatory period. It is not clear at this stage what demand management initiatives will be included and whether funding is already available from within base operating costs. A review of this program will be required at the next review in order to determine whether the initiatives are justified (the efficiency of demand management initiatives is considered in section 10)."

The Water Corporation has proposed an increase in operating expenditure (from 20011/12) of $11 million per year for Southern Seawater Desalination Plant to purchase renewable energy.

Regarding the expenditure on the Southern Seawater Desalination Plant, Halcrow Pacific considered that the Water Corporation is not acting commercially in its approach to procuring energy for the Southern Seawater Desalination Plant. The Water Corporation has proposed to procure 80 per cent of the energy requirements from a commercially proven energy supply and up to 20 per cent from renewable energy sources that are untested at a commercial scale. Water Corporation has indicated that it would be prepared to pay a premium to promote investment in the Western Australian renewable energy market, which may help to meet any future Water Corporation requirements. According to Halcrow Pacific:

- Water Corporation has an obligation to their customers to source renewable energy at lowest possible cost and should therefore seek to source 100 per cent of the desalination plant's energy requirements from the Tranche 1 energy supplier.
- It is not within Water Corporation's core responsibilities to engage in industry support and/or research and development over and above stated government instructions/obligations.
- It is unclear whether the Corporation's proposed support for alternative renewable energy would have any material impact on investment in the sector. (Halcrow Pacific, p72)

Halcrow Pacific did not consider it appropriate that the Water Corporation engage in such research and development ventures unless it did not impact on water prices, and/or Water Corporation customers indicated they were willing to pay, and/or the State Government directed the Water Corporation to undertake these ventures.

Conclusion

The Authority considers that the Water Corporation continue to be set a target of reducing its base real operating expenditure per connection by 1.88 per cent per year. This efficiency target is in line with the target applying to water businesses in New South Wales and higher than the target applying in Victoria.

In relation to the Water Corporation's operating expenditure associated with improving levels of service, the Authority is concerned that a full analysis could not be undertaken due to the lack of information on similar expenditure included in base operating costs. Notwithstanding this constraint, Halcrow Pacific recommended a reduction in operating expenditure of $18 million for the period 2009/10 to 2012/13. The Authority notes that there is uncertainty about whether the Water Efficiency Program and Water Cycle Strategy represent new expenditure that can be classified as expenditure to increase levels of service or whether the expenditure is part of base expenditure.

After due consideration, the Authority has accepted the Water Corporation's proposed operating expenditure for the purpose of setting tariffs for the regulatory period. However, at the next regulatory review, the Authority would expect information to be available in a form that would permit a full analysis of proposals to increase level of service expenditure. The Authority will reconsider the case for the Water Efficiency Program and Water Cycle Strategy to be treated as new level of service expenditure at its next review.

The Authority further recommends that customers should not pay for any premium associated with the Water Corporation's strategy to procure up to 20 per cent of the energy requirements of the Southern Seawater Desalination Plant from renewable energy sources that are untested at a commercial scale.

Aqwest

Background

Aqwest sets internal efficiency targets (e.g. for unaccounted for water, energy consumption, off peak power usage, operating cost per property and operating cost per ML) and reports on these targets in its Annual Report. Recent programs to improve operating efficiency include the Water Treatment Plant Automation Project, which enables the treatment plant to be run remotely and helps to minimise energy costs. In addition, a project to reduce unaccounted for water has resulted in significant savings in lost revenue. A new maintenance strategy is due to start development this year, which will provide Aqwest with a more targeted risk-based approach to maintenance planning and scheduling.

Historical operating expenditure

Aqwest's real operating cost per connection has increased from $335 in 2004/05 to $354 in 2007/08. In comparison, Busselton Water's operating cost per connection has decreased from $344 to $331 over the same period.

While noting the difference in operating costs per connection between Aqwest and Busselton Water, Halcrow Pacific did not identify any inappropriate historical operating expenditure.

Projected operating expenditure

Aqwest did not comment in their submission on any future operating expenditure efficiency target.

Aqwest's real operating cost per connection is projected to decrease from $354 in 2007/08 to $258 in 2012/13.

Halcrow Pacific's advice was that it would be inappropriate to set a defined operating efficiency target for Aqwest due to the limited opportunities for economies of scale. Halcrow Pacific prefers Aqwest to continue to identify potential opportunities for efficiencies where appropriate. The consultant pointed in particular to future maintenance contracts, material supply contracts, energy procurement arrangements and capital planning processes.

Conclusion

For the purpose of this review, the Authority has included Aqwest's operating expenditure projections.

Busselton Water

Background

The Shire of Busselton is one of the fastest developing municipalities in Australia with a projected annual growth rate of 4 per cent. Busselton Water has therefore developed a strong emphasis on the upgrading and ongoing maintenance of its water distribution infrastructure.

Historical operating expenditure

As indicated above, Busselton Water's operating cost per connection has decreased from $344 to $311 between 2004/05 and 2007/08. In reviewing Busselton Water's historical operating expenditure, Halcrow Pacific did not identify any inefficient expenditure.

Projected operating expenditure

Busselton Water's real operating cost per connection is projected to increase from $311 in 2007/08 to $386 in 2012/13. The increased operating expenditure is associated with water production and administration costs.

As with Aqwest, Halcrow Pacific considers was that it would be inappropriate to set a defined operating efficiency target for Busselton Water due to the limited opportunities for economies of scale. Halcrow Pacific prefers Busselton Water to continue to seek out and identify potential opportunities for efficiencies where appropriate.

Conclusion

For the purpose of this review, the Authority has included Busselton Water's operating expenditure projections.

8.8 Prudency of Capital Expenditure

8.8.1 Background

Capital costs are the costs of purchasing and constructing new physical assets used to provide services. For the purposes of this inquiry, all three of the water businesses have been required to submit to the Authority their actual capital expenditure for the past regulatory period, forecasts of capital expenditure for the coming regulatory period and the processes they use to achieve cost-effectiveness.

The Authority requested that Halcrow Pacific assess the processes for project delivery for each of the water businesses. The consultant's reports are available on the Authority web site.

8.8.2 Submissions

Water Corporation

Key messages / principles that the Corporation encourages the ERA to consider when conducting its review include:

1) Determining the efficiency of a capital program is best appreciated by understanding the efficiency of the capital delivery process….
2) An appreciation and evaluation of risk is a key factor underlying the Corporation's capital delivery program....
3) The Corporation's total capital budget is determined by the Government which balances the needs of the water industry with the overall needs of the State….
4) The efficiency of the Corporation's capital program needs to be considered in the context of the overall needs of the State, with the Corporation being just one of many organisations delivering services to the community.
5) The Corporation is under continuing pressure from external forces to deliver increasing levels of service.

(Water Corporation submission, p49-50)

Department of Treasury and Finance

[T]he DTF supports the alliance contracting undertaken by the Water Corporation as a means of attracting private sector participation and introducing competitive pressures to its infrastructure development program. (Department of Treasury and Finance submission, p15)

8.8.3 Assessment

For each service provider, the Authority requested Halcrow Pacific to:

- compare actual capital expenditure over the period since the 2005 pricing inquiry to the projected capital expenditure for that period, and
  - investigate the reasons for any substantial differences between projected and actual expenditures, and
  - identify any capital expenditure that was not appropriate.

- examine the processes used by the utilities to approve capital expenditures and determine whether, and how, those processes can be improved to ensure efficiency in capital investments; and
- identify any planned capital expenditure that is not appropriate.

Water Corporation

Historical expenditure

The Water Corporation's capital expenditure program (used as the basis for the tariffs set by the Government following the 2005 inquiry) amounted to $1,720 million (in nominal dollars) for the three years from 2005/06 to 2007/08. The actual expenditure for that period was $2,011 million, an increase of $291 million.

The main reasons for the increase in capital expenditure included:

- cost escalation (+$149 million);
- additional projects (+$168 million), including:
  - $69 million on various wastewater treatment plant projects;
  - $30 million on infill sewerage;
  - $20 million on the Southern Seawater Desalination Plant;
  - $14 million on the Gnangara Mound Replenishment Trial.
- the deletion of the South West Yarragadee project (-$103 million); and
- expenditure carried over from projects that were not completed in earlier years ($99 million).

Halcrow Pacific advised that they did not identify any inappropriate historical capital expenditure.

Capital processes

Overall, Halcrow Pacific considered that the procurement and delivery strategies currently adopted by the Water Corporation are innovative and encourage competitive delivery of the capital investment program. In addition, Halcrow Pacific was satisfied that the Water Corporation has in place robust procedures for the delivery of its capital investment projections.

Halcrow Pacific considered that the deviation between the Corporation's year-ahead budgeted expenditures and its actual expenditures were "not substantial". Halcrow Pacific also identified a number of general issues.

- A lack of alignment between the Water Corporation's strategic documents (the Strategic Development Plan, which is the confidential document that sets out the five year direction of the Water Corporation, the Strategic Asset Management Plan, which is the confidential document that provides the strategic direction for asset management, and the Statement of Corporate Intent, which is the detailed view of the business objectives, targets and priorities for the first year of the Strategic Development Plan).
- Whether the Strategic Development Plan should become a public document. Halcrow Pacific considers that the Water Corporation is a publicly owned utility and the way it operates should be transparent to its customers. The Water

Corporation has advised that the Strategic Development Plan contains commercially sensitive information that is prepared specifically for the Minister. In addition, the Water Corporation has indicated that the Statement of Corporate Intent, which provides information for the year ahead, is publicly available and that other information providing the medium term strategy is already in the public domain (such as financial forecasts underlying the State Budget, and strategies for which there has been public consultation, e.g. Water Forever).

- The need for an internal review of the Water Corporation's capital planning and delivery processes once the Southern Seawater Desalination Plant is fully commissioned, to assess whether the processes are still adequate to deliver the increased capital works program that is expected from 2012/13.

Planned expenditure

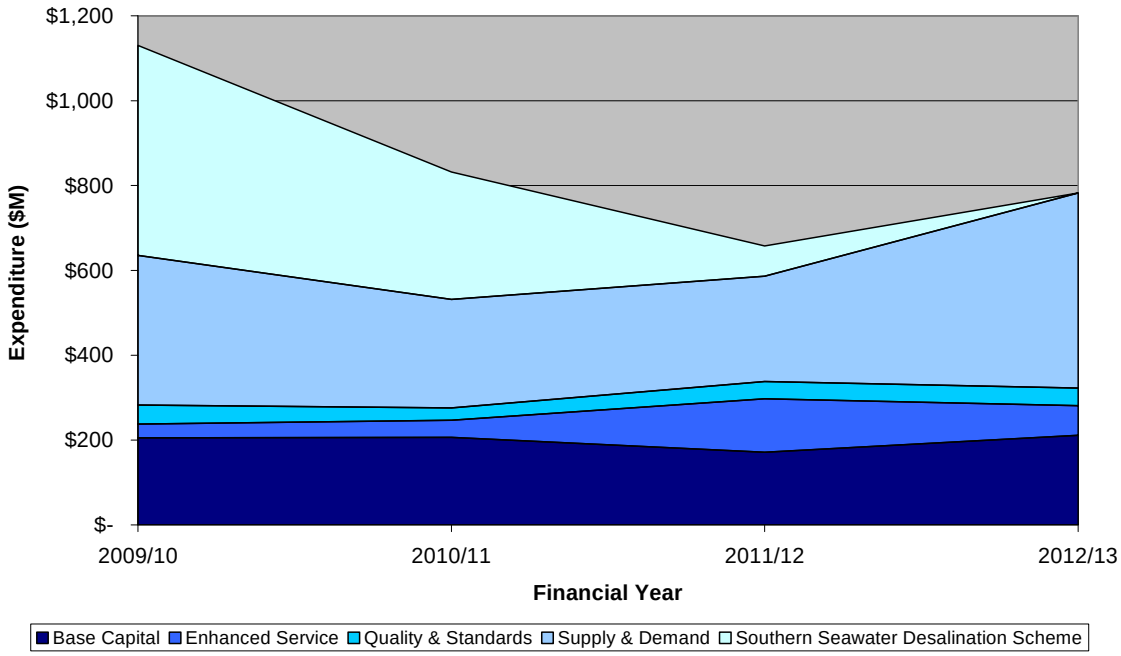
The Water Corporation's currently approved capital expenditure program (i.e. the program approved by the Government in the 2009 Budget process) for the period 2009/10 to 2012/13 amounts to $3,545 million (in nominal dollars). Projected capital expenditure is expected to average $886 million per year, compared to $773 million per year over the period 2005/06 to 2008/09.

The Water Corporation allocates its capital expenditure on the basis of a number of key factors.

- Base capital maintenance – to maintain the current level of service to existing customers.
- Supply and demand balance – to meet capacity requirements and demand growth.
- Quality and standards – to meet standards that have been externally imposed.
- Enhanced service – to improve the level of service being provided to existing customers.

The following figure provides the breakdown of capital expenditure (according to these categories) for the period 2009/10 to 2012/13.

Figure 8.3 Water Corporation Capital Expenditure Forecast by Expenditure Driver ($Million, 2009/10 - 2012/13)



Source: Water Corporation

Major projects include:

- $867 million on the Southern Seawater Desalination Plant;
- $1,315 million on regional projects in Western Australia;
- $105 million on Alkimos WWTP;
- $205 million on Mundaring Water Treatment Plant.
- $129 million on Beenyup WWTP; and
- $74 million on Subiaco WWTP.

Halcrow Pacific reviewed five of the Water Corporation's larger capital projects:

- Ravenswood transfer pump station;
- Beenyup WWTP amplification;
- Groundwater replenishment trial;
- Wungong trunk main; and
- Carabooda tank and inlet/outlet.

The consultants concluded that the projects were necessary and that "the Corporation has generally undertaken robust analyses to the standard expected". The key conclusions were:

- the drivers of the five projects reviewed were in line with corporate and strategic objectives, and in other cases Government growth policies or recycled water targets. There was evidence of the consideration of long term strategic planning options in conjunction with lowest cost principles;
- the expected delivery dates in some instances did not match the basis of the cost information underlying the Water Corporation's capital expenditure projections;

- over $12.5 million of expenditure for the Beenyup WWTP related to the alliance contract's risk/reward scheme that should not be included within the total cost estimate;
- there were significant variations between planning cost estimates and estimates made in the Implementation Business Cases which, in some cases, exceeded 200 per cent. The consultants recommended that the Corporation improve its planning cost estimates to better reflect the actual cost of future capital projects; and
- the consultants experienced significant delays in the receipt of information supporting the expenditure proposed and expected this basic supporting information to be more readily available.

Conclusion

The consultant's report was generally positive about the processes involving the Water Corporation's capital expenditure program. In reviewing five major projects, Halcrow Pacific found that the net variance between the Water Corporation's actual expenditure and the "efficient" level of expenditure was relatively small. In addition, the Authority notes that the recommended cost savings are very small in relation to the total planned capital expenditure.

After due consideration, the Authority has accepted the Water Corporation's proposed capital expenditure.

Aqwest

Historical expenditure

Aqwest's capital expenditure program (used as the basis for the tariffs set by the Government following the 2005 inquiry) amounted to $11.9 million (in nominal dollars) for the three years from 2005/06 to 2007/08. The actual expenditure for that period was $19.7 million, an increase of $7.8 million.

The main reasons for the increase in capital expenditure was the construction of a 8.4 km pipeline at a cost of $4.6 million (the City Water Link Project). The purpose of this pipeline was to reduce the need for Aqwest to produce water from its coastal bores and to make provision for future high-volume demand from development in Bunbury.

While Halcrow Pacific found a wide variance between Aqwest's annual budget projections and its actual capital expenditure, Halcrow Pacific did not find that any of the historical expenditure was inappropriate. Halcrow Pacific noted that some process improvements currently underway within Aqwest should help to improve Aqwest's capital expenditure delivery.

Capital processes

Halcrow Pacific was satisfied with Aqwest's corporate and strategic planning and suggested some minor improvements. The consultants noted that further refinement and development of risk management principles would be appropriate for deciding between investment options. In addition, the consultants found that business cases could be improved for larger projects.

Planned expenditure

Aqwest's proposed capital expenditure program for the period 2008/09 to 2012/13 amounts to $20.1 million (in nominal dollars). Projected capital expenditure is expected to average $4 million per year, compared to $6 million per year over the period 2005/06 to 2007/08.

The most significant expenditure is $6.3 million on water treatment plants and $5.0 million on mains.

Halcrow Pacific advised that they did not identify any inappropriate planned capital expenditure.

Conclusion

After due consideration, the Authority has accepted Aqwest's proposed capital expenditure.

Busselton Water

Historical expenditure

Busselton Water's capital expenditure program (used as the basis for the tariffs set by the Government following the 2005 inquiry) amounted to $6.4 million (in nominal dollars) for the three years from 2005/06 to 2007/08. The actual expenditure for that period was $5.8 million. Halcrow Pacific found that the historical expenditure was appropriate.

Capital processes

Halcrow Pacific advised that they were satisfied with Busselton Water's strategic planning processes and risk management approaches. Issues raised by Halcrow Pacific include the need for Busselton Water to formally document an options analysis process for larger capital projects including the development of a formal sustainability assessment framework. In addition the consultants recommended Busselton Water should undertake a formal project close-out review process for the more significant capital projects undertaken.

Planned expenditure

Busselton Water's proposed capital expenditure program for the period 2008/09 to 2012/13 amounts to $12.3 million (in nominal dollars). Projected capital expenditure is expected to average $2.45 million per year, compared to $1.9 million per year over the period 2005/06 to 2007/08.

The most significant individual item of expenditure is a $2 million purchase of a new administration building.

Halcrow Pacific advised that they did not identify any inappropriate planned capital expenditure.

Conclusion

After due consideration, the Authority has accepted Busselton Water's proposed capital expenditure.

9 Rate of Return

9.1 Terms of Reference

This section addresses the following specific issue referred to in the Terms of Reference:

- the appropriate rate of return on each service provider's assets;

9.2 Recommendations

Recommendation

34) For Water Corporation, the rate of return (pre-tax real) be set at 6.62 per cent.

35) For Aqwest and Busselton Water, the rate of return (pre-tax real) be set at 7.14 per cent.

36) The rates of return for Water Corporation, Aqwest and Busselton Water should be updated in 2010 prior to the tariffs being set for the regulatory period.

37) The initial asset values used for the purpose of determining tariffs be set at $30.4 million for Aqwest and $20.5 million for Busselton Water (as at 30 June 2008, in real dollar values of 2009).

38) The initial regulatory asset value for Water Corporation should not be revised.

9.3 Reasons

Compared to the Authority's advice to the Government in 2005, the Authority is now recommending the Government apply higher rates of return to the Water Corporation, Aqwest and Busselton Water. The higher rates of return are largely due to changes in global financial markets which have resulted in upward pressure on the margin that lenders are seeking from their investments in utilities. An offsetting factor is that the Authority has reconsidered the relative competitiveness of the water services industry in comparison to the electricity and gas industries and has concluded that the water industry is significantly less competitive (and therefore does not require as high a rate of return). Further, the Authority considers that, for the purpose of calculating the rate of return, a credit rating of A- should be applied to the Water Corporation rather than the BBB+ (companies with a higher rate of return generally have lower debt servicing costs) as previously recommended by the Authority in 2005. However, the Water Boards should continue to be assigned a credit rating of BBB+.

The parameters used to calculate the rates of return have been calculated as at 31 July 2009 and will need to be updated in 2010 prior to the tariffs being set for the

regulatory period. The main parameters that vary with time are the risk free rate, the inflation rate and the debt margin.

In considering the appropriate return on assets, the Authority has considered the rate of return and the asset values for which the rate of return applies. The Authority recommends that the initial regulatory asset value of the Water Corporation (which was set following previous reviews) remain unchanged; and that the regulatory asset values for Aqwest and Busselton Water be set at levels that ensure these businesses remain financially viable. It should be noted that the regulatory asset values for the water boards are lower than their book values, which is appropriate given the need to avoid a substantial and unwarranted increase in tariffs.

9.4 Rate of Return

9.4.1 Background

Investors have a right to expect a return on the value of their assets equal to the cost of capital associated with the regulated activities. Assets are often financed by a combination of debt and equity. Thus, the returns from an asset must compensate both the providers of debt and the equity holders. For this reason, the term "Weighted Average Cost of Capital" (**WACC**) is often used to refer to the average cost of debt and equity capital, weighted by a proportion of debt and equity to reflect the financing arrangements for the assets.

In setting a rate of return, the objective is to ensure that investment funds continue to flow to the regulated industry, while at the same time ensuring that customers pay no more than is necessary to provide the service efficiently.

The rate of return determined by the Authority is used as an input for setting allowable revenues for the three service providers. The Authority calculates the WACC for the Water Corporation, Aqwest and Busselton Water by:

- using the Capital Asset Pricing Model (**CAPM**) to estimate the return on equity; and
- calculating a pre-tax real WACC.

For further details on how the Authority calculates the rate of return, see Appendix F.

In previous advice, the Authority adopted the same WACC assumptions for all three utilities, with the exception of the assumption as to the level of financial gearing of the business and the associated equity beta value (which captures the exposure of the business to risks that cannot be eliminated by investors through portfolio diversification).

Based on empirical evidence from the cost structures of other utilities, a standard gearing assumption for large utility businesses – of similar size to the Water Corporation – is 60 per cent. However, for Aqwest and Busselton Water such a level of gearing may not be achievable given the relatively small sizes of the businesses and the exposure of the businesses to cost variations. For this reason, the Authority's previous advice assumed a lower level of gearing of 40 per cent for the Water Boards.

In the 2005 Inquiry, the Authority calculated a real pre-tax WACC of 5.63 per cent for the Water Corporation and 5.87 per cent for Aqwest and Busselton Water.

Since the WACC was originally set in 2005, there have been a number of parameter changes to the calculation inputs (including increased margins for those wishing to secure debt), largely driven by changes in global financial markets.

9.4.2 Submissions

In its submission, the Water Corporation proposed an indicative range of three values to the real pre-tax WACC: (i) 6.87 per cent (low end); (ii) 7.63 per cent (medium/low); and (iii) 8.05 per cent (medium end). The differences between these three WACC values are explained by the differences in terms of debt risk premium (for a credit rating of BBB+) and equity betas in the range of 0.65 (low); 0.80 (low/medium) and 0.90 (medium). The Water Corporation also noted that:

> [G]iven the pricing approach applied by the ERA, the Corporation faces no demand risk with any variance between forecasts and actual revenue requirements adjusted for in future years. This is an argument for an equity beta that is lower than eastern state utilities. However, another significant difference that would warrant an equity beta at the higher end of the plausible range concerns the certainty of price paths. Technically speaking, the uncertainty of price paths does not affect systematic risk, yet it does impact significantly upon Corporation-specific risk. Under the current regulatory arrangements in West Australia, the ERA provides pricing recommendations only. Any debate concerning the systematic risk profile of the Corporation needs to be considered in the current context of the inherent uncertainty with prices are only linked to costs subject to annual reviews. (Water Corporation submission, p.35)

The Water Corporation in their submission, illustrated the impact on prices of alternative rates of return.

Table 9.1 Impact of Changes in the WACC on Revenue and Prices

	Current	Low	Medium/Low	Medium
WACC	5.63%	6.87%	7.63%	8.05%
Additional Revenue Required		$180m	$250m	$290m
Price Impact of Change		10%	16%	20%

Source: Water Corporation

The Department of Treasury and Finance requested that the Authority take into account factors such as the level of competition, the cost of debt, and regulated rates of return in the electricity sector.

> [T]he application of competitively neutral parameters is considered to be the most appropriate. Such matters to consider in the calculation of a rate of return for each of the service providers would be its legislatively protected customer base and the availability of debt funding at below market rates through the Government's Treasury Corporation.
>
> For the determination of the Weighted Average Cost of Capital, the ERA is requested to consider the application of the methodology it has determined to apply to the cost of capital for covered electricity networks as an appropriate basis for the water service providers.
>
> (Department of Treasury and Finance submission, p15)

9.4.3 Assessment

The Authority proposes the following WACC parameters be adopted for the purpose of calculating the rate of return on capital to apply for Water Corporation, Aqwest and Busselton Water. Further details are available in Appendix F of this report.

Nominal risk free rate

The risk free rate has been calculated using the market data prevailing on the 20 trading days prior to 31 July 2009. The 10 year Commonwealth bond averaged **5.52 per cent** for this period. This approach is consistent with the approach used in previous decisions by the Authority and by other regulators across Australia. The approach was also supported by the Water Corporation.

Australian market risk premium

The market risk premium (MRP) was set at **6.0 per cent** in 2005 and the Authority's view is that there is no clear justification for increasing or decreasing the MRP in the current economic climate. The MRP has been determined following consideration of a range of sources of information, including evidence on historically realised equity premia and current practice and expectations of market participants.

Equity beta

The Authority recommends an equity beta of **0.65** for Water Corporation, Aqwest and Busselton Water.

The equity beta has been reduced from the 0.8 used in the 2005 inquiry, for the reason that the Authority has reconsidered the relative competitiveness of the water services industry in comparison to the electricity and gas industries, and has concluded that the water industry is significantly less competitive. Recent decisions by other regulators indicate that the equity beta for the electricity industry ranges from 0.8 to 1.0 and for the gas industry ranges from 0.8 to 1.33. In addition, the proposed equity betas for the Water Corporation, Aqwest and Busselton Water are consistent with the decision by the Essential Services Commission (the Victorian economic regulator) in June 2008 on Victorian non-metropolitan water prices.

The Cost of Debt

The Authority recommends a debt margin, above the risk free rate, of **2.725 per cent** for the Water Corporation, which comprises in debt risk premium of 260.0 basis points and debt issuing cost of 12.5 basis points. This debt margin corresponds to a credit rating of A-.

For Aqwest and Busselton Water, the Authority recommends a debt margin, above the risk free rate, of **2.925 per cent**, which comprises a debt risk premium of 280.0 basis points and debt issuing costs of 12.5 basis points. The debt margin corresponds to a credit rating of BBB+. The lower credit rating for the Water Boards in comparison to the Water Corporation reflects the higher business risk associated with the smaller size of the Water Boards.

The Benchmark Financing Structure: Debt versus Equity

The Authority recommends a gearing of **60 per cent** (i.e. 60 per cent debt, 40 per cent equity) for the Water Corporation and **40 per cent** for Aqwest and Busselton Water.

The Authority acknowledges that these standard assumptions do not accurately reflect the actual financial structures of the Water Corporation and the Water Boards. However, they are commonly assumed benchmark gearing levels for businesses in the water industry.

Inflation rate

The Authority proposes to adopt the inflation rate of **2.38 per cent.** This is based on a geometric mean of 10 years expected inflation for the period from June 2010 to June 2019, using the RBA's inflation forecasts for the first two years and the mid–point of the RBA's target inflation range (i.e. 2.5 per cent) for the remaining eight years. The Authority has concluded from its analysis of alternative approaches to inflation estimation that this approach, which is also used by the AER, is likely to produce a more reliable estimate of inflation than non-market based approaches.

Corporate tax rate

The Authority recommends the statutory rate of corporate income tax of **30 per cent** be applied to the calculation of the rate of return.

Value of imputation credits

The Authority recommends a value of imputation credits of **0.65**. This value indicates the taxation benefits that shareholders are expected to obtain from imputation. The higher the value, the lower the pre-tax income required in order to justify investment. The value chosen by the Authority is based on recent studies of the utilisation of imputation credits in Australia.

Conclusion

A real pre-tax WACC of **6.62 per cent** is recommended for Water Corporation and **7.14 per cent** is recommended for Aqwest and Busselton Water. These figures are higher than the Authority's recommendation in November 2005 (when the figures were 5.63 per cent and 5.87 percent, respectively).

Table 9.2 Proposed WACC Parameters for the Water Corporation, Aqwest and Busselton Water

Parameter	Current (Nov 2005)		Water Corporation's Proposal (September 2008)			Authority's Recommendation	
	Water Corporation	Water Boards	Low	Medium/ Low	Medium	Water Corporation	Water Boards
Nominal Risk Free Rate	5.23%	5.23%	6.34%	6.34%	6.34%	**5.52%**	**5.52%**
Real Risk Free Rate	2.42%	2.42%	3.49%	3.49%	3.49%	**3.07%**	**3.07%**
Inflation Rate	2.74%	2.74%	2.75%	2.75%	2.75%	**2.38%**	**2.38%**
Debt Proportion	60%	40%	60%	60%	60%	**60%**	**40%**
Equity Proportion	40%	60%	40%	40%	40%	**40%**	**60%**
Cost of Debt; Debt Risk Premium	1.00%	1.00%	2.10%	2.45%	2.70%	**2.600%**	**2.800%**
Cost of Debt; Debt Issuing Cost	0.125%	0.125%	0.13%	0.13%	0.13%	**0.125%**	**0.125%**
Cost of Debt; Risk Margin	1.125%	1.125%	2.23%	2.58%	2.83%	**2.725%**	**2.925%**
Australian Market Risk Premium	6.00%	6.00%	5.50%	6.00%	6.00%	**6.00%**	**6.00%**
Equity Beta	0.8	0.6	0.65	0.8	0.9	**0.65**	**0.65**
Corporate Tax Rate	30%	30%	30%	30%	30%	**30%**	**30%**
Franking Credit	50%	50%	50%	50%	50%	**65%**	**65%**
Nominal Pre Tax WACC	8.53%	8.77%	9.80%	10.59%	11.02%	**9.16%**	**9.69%**
Real Pre Tax WACC	**5.63%**	**5.87%**	**6.87%**	**7.63%**	**8.05%**	**6.62%**	**7.14%**

9.5 Asset Valuation

9.5.1 Background

In the Authority's advice to the Government in the 2005 Inquiry into Urban Water and Wastewater Pricing, the Authority used the deprival value method of determining initial asset values for the three water service providers. This method involves calculating an initial asset value that delivers the same revenue projections for a ten year period as was previously expected by the service providers.[68] It was a pragmatic approach to establishing an initial asset value that meant there would not be significant variations in either tariffs or net payments to government from what had been previously expected. The asset value would then be rolled forward by adding capital expenditure and subtracting depreciation to ensure that, from 2005 onwards, price changes would reflect any variations in capital and operating costs incurred.

[68] In the case of Aqwest and Busselton Water, the Authority made an upward adjustment to the revenue projection to recognise the view that they did not recover from customers a return on equity.

The initial asset values determined for each service provider as at 30 June 2005 (in dollar values of 2005) were:

- $10,599 million for the Water Corporation;
- $25.1 million for Aqwest; and
- $14.7 million for Busselton Water.

9.5.2 Submissions

The Water Corporation indicated in its submission that the changed treatment of developer contributions (as discussed above in section 7.5.5 may warrant a revision to the initial asset value.[69]

The submission from Aqwest in response to the Issues Paper indicated that they do not accept a regulatory asset value that is significantly lower than their book value (which at 30 June 2005 was approximately $44 million[70]).

> The fact that Regulation Asset Values for the Water Corporation and Busselton Water largely matched their book values where Aqwest's were calculated at just above 50% of book value would suggest some form of gross error or differential treatment. (Aqwest Submission to Issues Paper, p1)
>
> The recommendations reduce pricing to such a low level that the Board is forced into debt. This is a totally inappropriate outcome. (Aqwest Submission to Draft Report, p2).

9.5.3 Assessment

Water Corporation

Generally, once an initial regulatory asset value has been set, it is not reset. The initial regulatory asset value for the Water Corporation was set following the 2005 inquiry, and submissions to this inquiry have not requested the value be reconsidered. However, the Water Corporation has considered that the change in the treatment of developer contributions is an exceptional event that may warrant a revision to the initial asset value.

As discussed in section 7.5.5, all else being equal, if the Authority had applied the revised treatment of developer contributions to the Water Corporation at the time of the 2005 inquiry, the initial asset value would have been lower. Instead of $10,599 million, the initial asset value would have been $9,231 million.

In considering whether to recommend an amendment to the value of the initial asset value, the Authority has considered an alternative cost-based method of calculating the initial asset value. This exercise involved calculating what the book value would be if it did not include assets that were either contributed or funded by developers.

Data limitations constrained this exercise to the period commencing 1994 (ideally, this exercise would have commenced at the time developer contributions were introduced). The exercise involved taking the 30 June 1994 book value and rolling it forward by adding capital expenditure, while taking care not to add to the asset base any assets that were funded by developer contributions.

[69] Water Corporation, submission on draft report, p32.

[70] Aqwest 2006 Annual Report.

The resulting estimate of the initial asset value for the Water Corporation as at 30 June 2005 (in dollar values of 2005) was $12,922 (compared to a deprival value of $10,599 million). The calculated asset value for the Water Corporation is higher than the deprival value, which indicates that the revenue projections used to calculate the deprival value may have been too low.

There is therefore a case for both increasing and decreasing the initial asset value for the Water Corporation. The Authority has investigated the financial impacts on the Water Corporation from leaving the initial asset value unchanged.

Assuming an ongoing dividend payout ratio of 85 per cent, the Water Corporation's financial accounts remain healthy for the length of the regulatory period:

- Net profit averages $507 million (compared to a net profit of $527 million in 2007/08).
- Net assets increase from $8,836 million in 2007/08 to $9,574 million in 2012/13.
- The gearing level in 2012/13 is 29.3 per cent of the book value and 28.3 per cent of the regulatory asset value (compared to 20 per cent of the book value in 2008/09).
- The implied credit rating is A- (see Appendix G for an explanation of how this credit rating has been calculated).

However, by 2018/19 the gearing level is projected to increase to 42.1 per cent of the book value and 37.9 per cent of the regulatory asset value (compared to 20 per cent of the book value in 2008/09) and the implied credit rating falls to BBB$^-$. The Authority considers that the Government should consider the financial sustainability of the Water Corporation in light of the level of the dividend payout ratio, which is currently set at 85 per cent (if the dividend payout ratio were reduced the financial indicators would improve).

For the purpose of this report, the Authority has not revised the initial asset value set for the Water Corporation following the 2005 inquiry.

Aqwest

The initial asset values for the Water Boards were not set by the Government following the 2005 inquiry. These initial asset values therefore have to be set as part of this inquiry. The Authority considered the proposal by Aqwest to simply set the initial regulatory asset value as the book value. However, the book value includes assets that were contributed by developers and for which the service providers are not entitled to profit from.

As alternatives, the Authority has considered the appropriateness of:

- an estimate of the deprival value that has been calculated using Aqwest's current financial projections (and reflecting the change to the treatment of developer contributions); and
- an estimate of the book value excluding assets that were either contributed or funded by developers (using the same method as was applied to the Water Corporation).

The resulting asset values as at 30 June 2008 (in dollar values of 2009) are:

- $35.9 million for the deprival value; and
- $30.4 million for the book value excluding contributed assets.

For the adjusted book value exercise, the Authority used the period commencing 1 July 1995 and adjusted the opening book value then for the value of financial reserve held at the time for the reason that the value of financial reserves cash contributed by developers (and therefore represents prepaid assets).

The Authority has considered a proposal made by Aqwest that the starting point for this exercise should have been 1997 because of the revaluation of assets that occurred at that time. However, it is generally not appropriate to take into account asset revaluations for the purpose of setting tariffs because it can result in service providers recovering more than the cost of the assets.

The Authority has investigated the financial impacts on Aqwest from setting the initial asset value at either of these levels. Modelling of the financial accounts for the next 3 years indicates that if the initial asset value were set at $35.9 million, the financial indicators for Aqwest are very healthy (the following indicators are in nominal terms):

- Net profit averages $1.5 million over the regulatory period (compared to a net profit of $1.1 million in 2007/08).
- Net assets increase from $74.7 million to $81.9 million in 2012/13.
- The gearing level in 2012/13 is 0.9 per cent of the book value and 1.8 per cent of the regulatory asset value.
- The implied credit rating is AA (see Appendix G for an explanation of how this credit rating has been calculated).

If the initial asset value were set at $30.4 million, the financial indicators for Aqwest remain healthy:

- Aqwest's net profit averages $1.3 million.
- Net assets increase from $74.7 million to $81.2million in 2012/13.
- The gearing level in 2012/13 is 0.9 per cent of the book value and 2.1 per cent of the regulatory asset value.
- The implied credit rating is AA.

The Authority has undertaken further analysis of Aqwest's financial accounts by assuming Aqwest makes dividend payments to the State Government (at a rate of 50 per cent), even though dividends are not actually paid at present. This adjustment is necessary because it attempts to assess Aqwest's financial sustainability when it is treated in a competitively neutral way to its competitors (such as the Water Corporation for the provision of water to areas surrounding Bunbury). With this adjustment, Aqwest's financial accounts continue to remain healthy:

- Net profit averages $1.26 million over the regulatory period.
- Net assets increase from $74.7 million to $78.9 million in 2012/13.
- The gearing level in 2012/13 is 1.8 per cent of the book value and 4 per cent of the regulatory asset value.
- The implied credit rating is estimated at AA.

Overall, the Authority recommends that the initial asset value for Aqwest be set at $30.4 million as at 30 June 2008 (in real dollar values of 2009).

Busselton Water

The Authority has undertaken the same exercises for Busselton Water as were undertaken for Aqwest.

The resulting asset values for Busselton Water as at 30 June 2008 (in dollar values of 2009) are:

- $8.6 million for the deprival value; and
- $4.1 million for the book value excluding contributed assets.

The low calculated asset values, compared to Busselton Water's book value as at 30 June 2008 of $45.3 million) are due to the relatively high levels of cash contributions received from developers.

The Authority has investigated the financial impacts on Busselton Water from setting the initial asset value at $8.6 million. Modelling of the financial accounts for the next 3 years indicates that if the initial asset value is set at $8.6 million, the financial indicators for Busselton Water as follows (the indicators are in nominal terms):

- Net profit averages $0.4 million (compared to a net profit in 2007/08 of $3.1 million, although that profit was inflated by developer contributions).
- Net assets increase from $48.2 million to $51.0 million in 2012/13.
- The gearing level in 2012/13 is 3.1 per cent of the book value and 13.1 per cent of the regulatory asset value.
- The implied credit rating is estimated at AA-. (See Appendix G for an explanation of how this credit rating has been calculated).

The Authority considers that it would be appropriate to set Busselton Water's initial regulatory asset value at a level that ensures its financial sustainability. In considering an appropriate initial asset value, the Authority has assumed that Busselton Water makes dividend payments to the State Government (at a rate of 50 per cent), even though dividends are not actually paid at present. This adjustment is necessary because it attempts to assess Busselton Water's financial sustainability when it is treated in a competitively neutral way to its competitors (such as the Water Corporation for the provision of water to areas surrounding Busselton).

The Authority considers that if the initial asset value were set at $20.5 million,[71] then Busselton Water's initial regulatory asset value would be 45 per cent of its book value, which is the same proportion as for Aqwest.

On the basis of an initial regulatory asset value of $20.5 million, Busselton Water's financial indicators are healthy, even if dividends were paid at a rate of 50 per cent:

- Net profit averages $0.8 million.
- Net assets increase from $48.2 million to $51.0 million in 2012/13.
- The gearing level in 2012/13 is 3.1 per cent of the book value and 7.7 per cent of the regulatory asset value.
- The implied credit rating is AA.

[71] The asset value of $20.5 million reflects the comparative scale of operations. The water supply operations of Busselton Water are around two-thirds the scale of Aqwest (asset value of $30.4 million).

Under the assumption that no dividends are paid, Busselton Water's financial indicators are even healthier:

- Net profit averages $0.81 million.
- Net assets increase from $48.2 million to $52.2 million in 2012/13.
- The gearing level in 2012/13 is 3.0 per cent of the book value and 7.7 per cent of the regulatory asset value.
- The implied credit rating is AA.

Overall, the Authority recommends an initial asset value of $20.5 million for Busselton Water as at 30 June 2008 (in real dollar values of 2009).

10 Efficiency of Demand Management Activities

10.1 Terms of Reference

This section addresses the following specific issue referred to in the Terms of Reference:

- the efficiency of demand management activities;

10.2 Recommendations

Recommendations

39) Demand restrictions be reconsidered once the Southern Seawater Desalination Plant is operational.

10.3 Reasons

As discussed in section 2.6.2, the Authority considers that, following the implementation of the Southern Seawater Desalination Plant (SSDP), demand restrictions could be reconsidered.

The Authority has examined the cost effectiveness of rebate products and has found that most rebate products are an expensive way to achieve water savings. The water savings achieved by water efficient products (other than rain sensors, garden assessments and flow regulators) are more costly to society than the alternative of producing more potable water.

10.4 Background

There are a wide range of approaches to demand management. The Water Corporation estimates that up to 61 GL per year are saved as a result of its demand management programs. These programs include changes to infrastructure, as well as programs aimed at changing consumer behaviour (see Table 10.1).

Table 10.1 Water Corporation's Demand Management Approaches

Approach to Demand Management	Program
Infrastructure	Pressure reduction trials, reduced flow meters, leak detection programs
Regulation and legislation	Water efficiency policy, mandatory national labelling, Smart Approved Watermark, household sustainability assessment tool, 5-Star Plus building codes, cost-reflective pricing
Non-drinking water	Non-drinking water demonstration projects (e.g. Brighton Estate), non-drinking water decision-making frameworks, corporate non-drinking water positioning
Research and development	Integrated resource planning, Water Sensitive Communities, soil moisture trials, Watersmart project, water efficient turfs
Retrofitting	Waterwise rebates program, Waterwise plumbers trials, Water Corporation building retrofit
Water efficiency measures	Daytime sprinkler bans, 2 days-per-week sprinkler roster
Waterwise programs	Businesses, schools, plumbers, land developments, display villages, garden centres, irrigators, partners, local councils
Community education	Waterwise accounts, community based social marketing, education, marketing, seminars

Source: Water Corporation web site

Sprinkler Restrictions

The program of restrictions on sprinkler use in Western Australia is central to the demand management program. Sprinkler restrictions were re-introduced in 2001 and were made permanent in October 2007. The restrictions limit the use of sprinklers to two days per week for towns south of the line between Kalbarri and Kalgoorlie, and alternate days for towns north of this line. Garden bore use in Perth is limited to three days per week. Daytime sprinkler use is banned in all towns.

Waterwise Rebates

In its Draft Report, the Authority assessed the cost effectiveness of rebates under the former Waterwise rebate program, which has recently been discontinued by the Government.[72] The rebate program, funded by government, was introduced in 2003, and provided customer rebates towards the cost of a range of water efficient products. These included greywater reuse systems, domestic rainwater tanks, garden bores, water efficient washing machines, sub-surface irrigation systems, rain sensors, swimming pool covers, flow regulators and garden assessments to advise on waterwise gardens.

Mandatory Standards

Mandatory standards are prescribed under the 5-Star Plus building codes, implemented in 2007. These require that new houses meet minimum standards for energy and water efficiency, including 3 or 4 star rated water efficient fittings and fixtures, hot water outlets located near the hot water system, and covers on swimming pools.

[72] The Minister for Water, Dr Graham Jacobs, announced on 1 April 2009 that the Waterwise rebate program would not be extended beyond 30 June 2009.

10.5 Submissions

10.5.1 Sprinkler Restrictions

The Water Corporation submitted that its demand management programs, including sprinkler restrictions, are effective in reducing demand, cost effective compared with other options, and are widely supported by the community.

> The current water efficiency initiatives under the new state-wide Water Efficiency Measures include sprinkler rosters, best practice Waterwise programs, the Waterwise Rebate Scheme, behaviour change programs and other initiatives. The measures have been instrumental in reducing Perth's average annual per capita consumption from 185 kL in 2001 to 147 kL in 2007. This amounts to 61 GL of water saved per year, water that will not need to be provided through additional source development. (Water Corporation submission, p18)
>
> The range of behaviour change programs and other demand management initiatives are typically compared against the long run marginal cost for all new water sources, and are only implemented when they compare favourably to the alternative of available new sources. (Water Corporation submission, p18)
>
> Demand management initiatives receive wide community support as a sustainable approach to managing the State's water requirements. They are a complement to source development options. (Water Corporation submission, p3)
>
> [W]ater efficiency measures are justified…in response to growing community demand for sustainable water management. Market research indicates that 93% of the community supports the most recent water efficiency measures. (Water Corporation submission, p18)

In response to the Authority's recommendation to reconsider sprinkler restrictions following the completion of the SSDP, the Corporation submitted that sprinkler restrictions should not be relaxed unless other conditions are also met, including sufficient groundwater resources and dam levels, and community acceptance.

> **Water Corporation**
>
> As detailed in the Corporation's response to the Issues Paper, the completion of the SSDP is not the only requirement for revising watering rosters. The current sprinkler roster should not be relaxed unless and until:
>
> - the current stress on groundwater resources has been relieved, with the overdraw in the last few years paid back to the environment;
> - the sources (including dam levels) are sufficient to accommodate the additional demand without compromising supply security;
> - water efficient behaviours have been instilled in the community as a matter of habit;
> - there is community support to modify the sprinkler roster.
>
> Furthermore there are economic and environmental arguments for continuing to apply the sprinkler roster even if the State's water supplies are in a position to accommodate increased demand in the short-term.
>
> The demand management target detailed in the Corporation's Water Forever Directions Paper aims at reducing per capita consumption by a further 15% by 2030. Demand reductions of this magnitude would save an estimated $1.1bn in the cost of future source development.

> Efficient demand management is about changing long-term water use requirements, not only short-term behaviour, and this needs to be consistently applied over the whole source development cycle (i.e. initial surplus followed by supply/demand balance then capacity short-fall).
>
> (Water Corporation submission on Draft Report, Part A, p9-10)

Aqwest also submitted that its water efficiency measures (which include restricting sprinkler use to two days per week) have been effective in lowering water consumption.

> Water Efficiency Measures (WEMs) implemented on 1 October 2007 have resulted in an overall 10% reduction in consumption for 2007/08. This has a significant impact on revenue. (Aqwest submission, p8)

WACOSS noted the impact of higher water prices on low income consumers, and supported the use of non-price-based options for demand management.

> Research worldwide has indicated that water demand is relatively inelastic to increases in price. WACOSS asserts that increases to the price of water are not an effective or equitable way of achieving reduced levels of water consumption. This is especially true for people living on lower incomes, who have limited or no capacity to reduce their water use. Appropriate demand reduction strategies may include the further development of efficiency programs including improvement to building efficiency codes, which are appropriate and available to people living on lower incomes or else facing financial and other types of hardship. (WACOSS submission, p7)
>
> Some concessions and rebates are intended to promote certain types of behaviour, for example, rebates on rain water tanks. This public benefit is predominately environmental, where these changes to behaviour will hopefully result in greater resilience for residential water consumers in the case of declining water resources. In cases such as this, the concession or rebate is implicitly targeted at consumers who have the resources to cover the remaining, or upfront costs required to achieve the behaviour change. (WACOSS submission, p11)

However, the Department of Treasury and Finance supported a reconsideration of sprinkler restrictions following the new desalination plant, noting that any change to sprinkler bans is a decision for government.

> **Department of Treasury and Finance**
>
> The draft recommendation [that demand restrictions be reconsidered once the Southern Seawater Desalination Plant is operational] is supported.
>
> Nevertheless, it is important to note that the decision to retain sprinkler restrictions after the commissioning of the Southern Seawater Desalination Plant will be a decision for the Government.
>
> (Department of Treasury and Final submission on Draft Report, p28)

10.5.2 Rebates

The Department of Treasury and Finance supported a discontinuation of the rebate program.

> **Department of Treasury and Finance**
>
> The draft recommendation to discontinue inefficient rebates for water efficient products is strongly supported.

> Nevertheless, it is noted that the Waterwise Rebate program for all water efficient products is being discontinued after 30 June 2009.
>
> (Department of Treasury and Final submission on Draft Report, p28)

The Water Corporation submitted that the Waterwise rebate program had been successful in raising consumer awareness of water efficiency and encouraging the supply of water efficient appliances.

> **Water Corporation**
>
> The decision to discontinue with the rebate program has been made by Government, preferring to address the water efficiency targets through other means.
>
> The Corporation maintains that the Waterwise Rebate Program has been a successful initiative, providing supply security to the State's potable water service. It has helped raise awareness in the community for the need for water efficiency, providing a direction to that end. The scheme has also encouraged suppliers to introduce more water efficient appliances into the market (for example, washing machines).
>
> Following the conclusion of the rebate program in June 2009, the Corporation's intention is to undertake a robust cost/benefit analysis of the merits of the rebate program. This would address a number of the shortfalls in the approach and information availability of the review recently conducted. The Corporation would be pleased to share the results of this review with the ERA.
>
> Finally, the Corporation notes that there are a number of non-financial benefits from the purchase of waterwise products which are not captured in traditional cost benefit analyses. For example, people purchase rainwater tanks for taste reasons. Pool covers not only save water, but heat the water, reduce chemical use and keep the pool clean. While these benefits may accrue privately to the individual, the rebate program has facilitated their awareness.
>
> (Water Corporation submission on Draft Report, Part B, p33-34)

10.6 Assessment

10.6.1 Sprinkler Restrictions

The role of sprinkler restrictions in balancing water supply and demand has been considered earlier (see section 2.6.2). There are pros and cons of using sprinkler restrictions as opposed to price signals or other measures to manage water demand, and the appropriate time to consider alternative management strategies is immediately after a major augmentation, when supply security is less of a concern. The Authority therefore recommends that sprinkler restrictions be reconsidered once the Southern Seawater Desalination Plant is operational.

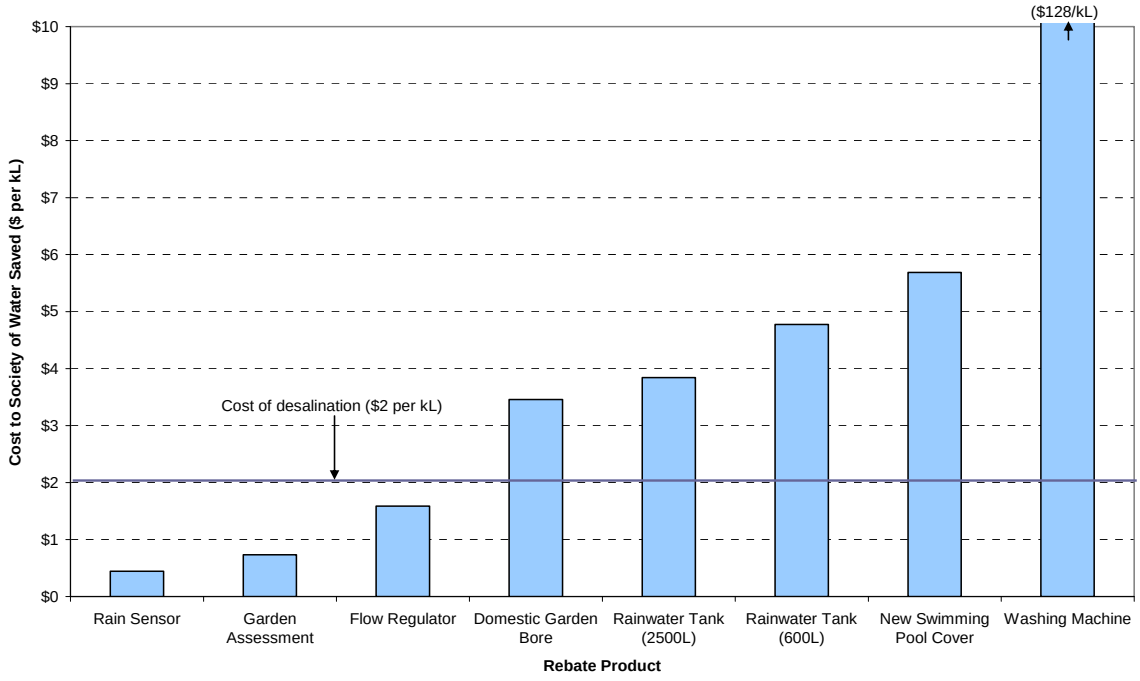
10.6.2 Waterwise Rebates

The Authority considered the appropriateness of rebates for water efficient products as an instrument to encourage the cost effective adoption of recycling and other sources. The effectiveness of rebates was assessed in terms of the cost per kilolitre of the resource cost of the water source (inclusive of the rebate) in comparison to the resource cost of scheme water. The analysis took into account:

- all of the costs associated with water saving technologies; i.e. the total cost per kilolitre of water saved, including the cost of the rebates and their administration, plus the costs to the customer of installing and operating the new technologies;
- the estimated water savings for each product;
- behavioural effects in the use of products, which can result in actual water savings being less than the maximum achievable water savings;
- the extent to which any water savings could be attributed to the rebate program.

The analysis showed that there are very few water efficient products (with the exception of rain sensors, garden assessments and flow regulators) that are cost effective when compared with the cost of securing new potable water supplies. Figure 10.1 summarises the estimated costs to society per kilolitre of water saved for different rebate products.

Figure 10.1 Costs to Society per kL of Water Saved for Rebate Products, 2003-2008



Source: From Department of Treasury and Finance and Economic Regulation Authority analysis

*Notes:

- Greywater re-use systems, upgrading existing swimming pool covers (to water-wise ones endorsed by the Smart Approved Watermark Scheme) and sub-surface irrigation are not shown, as these products have been assumed to *increase* water consumption, based on a recent survey of household water consumption (i.e. there are no water savings).
- Rainwater tank (2,500L) assumes 61 kL of water saved per year.
- New swimming pool cover assumes the purchase of a new water-wise pool cover rather than an upgrade from an existing (non-water-wise) pool cover.
- Costs per kL for washing machines reflect incremental water savings that would be achieved by customers switching from 4-star rated washing machines to 4.5-star rated washing machines.

10.6.3 Mandatory Standards

The Authority also considered the cost effectiveness of mandatory standards, as imposed through the 5-Star Plus building codes for new houses. As in the case of rebate products, the cost effectiveness of mandatory standards will depend on the cost per kilolitre of water saved.

The Authority concludes that mandatory standards involving water efficient technologies or new house design may generally involve little or no incremental cost to consumers, while achieving water savings.

11 Wastewater Cost Allocation

11.1 Terms of Reference

This section does not address a specific issue referred to in the Terms of Reference. However, consideration of the method for allocating costs between customers groups is necessary for the purpose of advising on appropriate wastewater tariff levels. It may be noted that the issue of cost allocation for water customers was discussed in Chapter 2, where it was recommended that residential and small business customers pay the same annual fixed charge.

11.2 Recommendations

Recommendations

40) The uniform approach to charging metropolitan and country commercial wastewater customers be continued for the next three years and reconsidered at the next regulatory review.

41) The cost of providing wastewater services within a scheme continue to be allocated between residential and commercial customers on the basis of existing relativities for the next three years and reconsidered at the next regulatory review.

11.3 Reasons

The Authority considers that the allocation of costs between different customer groups should gradually be changed so that the allocation is as cost-reflective as possible. For wastewater customers in the country, there is currently a significant risk that residential customers are cross-subsidising non-residential customers as a result of the current approach of having non-residential charges set on a state-wide basis but residential charges based on a scheme basis. However, the Authority considers that designing a new charging approach for country non-residential wastewater customers would be complex (for example, minimum and maximum charges may need to be set). In addition, the Authority considers that such a reform should be implemented after residential wastewater customers have been transitioned to an average flat charge.

The allocation of wastewater costs between residential and non-residential customers in Perth would also be improved if it were based more closely on relative levels of estimated discharge into the sewers. Again, the Authority considers that this reform should be considered once residential wastewater customers have been transitioned to an average flat charge.

11.4 Background

A particular area of focus for this inquiry is whether the allocation of costs between commercial and residential customers is appropriate. For the Corporation, the Authority has previously assumed, in the absence of better information:

- The sharing of costs between commercial and residential metropolitan wastewater customers is maintained at the existing level.
- Country residential wastewater customers pay, if they are not on the cap, the amount required to cover costs in each country scheme after revenue from commercial wastewater customers is taken into account. This situation arises because country commercial wastewater customers pay the same tariffs as metropolitan commercial customers.

11.5 Assessment

11.5.1 Cost Allocation Between Commercial and Residential Metropolitan Wastewater Customers

The Authority has considered whether the current method for allocating costs of wastewater service provision in the metropolitan area between residential and non-residential customers, which is based on maintaining existing relativities, should be modified in some way to achieve a more cost-reflective allocation of costs.

Submissions

As noted with the equivalent issue raised for water charges, the Corporation makes the following observations when considering this issue:

- Using price for efficient outcomes only becomes important where a price signal is effective (such as a volumetric charge). Where there is no effective signal, social considerations (such as 'ability to pay') may justify cost recovery in differing proportions for different customer bases. This is particularly relevant for wastewater charges as there is typically no level-of-use decision to be made.
- Given the method used to determine current prices and the use of a regulatory asset value, there is no reason why residential and non-residential charges should be the same.
- Rebalancing the proportion may simply shift the current discount (from writing down the regulatory asset value) from residential customers to non-residential customers. Non-residential charges need only be considered for "rebalancing" if they are greater than the cost of the full replacement value of the assets.

(Water Corporation submission, p44)

A volumetric based approach to the apportionment of costs between the residential and non-residential sectors would appear to be the most appropriate approach. (Department of Treasury and Finance submission, p15)

Assessment

Under the current approach to wastewater charging, it is estimated that in the year 2012/13 metropolitan residential customers would contribute 78 per cent of wastewater revenue, but would account for 82 per cent of estimated discharge to sewers. However, discharge to sewers is not measured directly, and is estimated by the Water Corporation.

The Authority compared two different options for the allocation of wastewater costs between metropolitan residential and non-residential customers.

- Option 1. Continue to allocate costs on the basis of existing relativities.
- Option 2. Set revenue shares for 2012/13 on the basis of estimated proportion of discharge to sewers, which would be more cost-reflective than the existing approach.

Table 11.1 shows the results of the two options. It can be seen that Option 2 (based on estimated discharge to sewers) would result in residential metropolitan wastewater charges being $30 higher than under the current approach, while commercial metropolitan wastewater charges would be $217 lower than under the current approach.

Table 11.1 Impact of Different Cost Allocation Approaches on Average Annual Wastewater Payments by Metropolitan Residential and Non-Residential Customers, Dollar Values in Real Dollars of June 2009

Metropolitan Wastewater Customers	Average Annual Payment		Change in Average Annual Payment Between 2009/10 and 2012/13	
	2009/10	2012/13	$	%
Option 1 – Costs Allocated on Basis of Current Tariff Structure				
Residential	548	579	10	2%
Non-Residential	1,473	1,554	27	2%
Option 2 – Revenue Shares in 2012/13 Reflect Proportion of Discharge				
Residential	548	609	20	4%
Non-Residential	1,473	1,337	-45	-3%

The Authority generally prefers cost-reflective approaches to setting tariffs. However, the Authority considers that increasing residential customers' payments by an additional $30 over the regulatory period would not be appropriate at this time given that customers with low GRV properties would be facing significant payment increases as a result of the transition to an average flat charge. The Authority considers that this issue should be reconsidered at the next regulatory review.

11.5.2 Cost Allocation Between Country Commercial and Residential Wastewater Customers

An issue that impacts on cost allocation between commercial and residential customers in the country is the current policy of charging commercial wastewater customers in the country the same tariffs as apply to commercial wastewater customers in the metropolitan area.

The current method of allocating costs could result in residential customers paying either too much or too little for their wastewater service in comparison to the actual costs of providing the service.

Submissions

The Water Corporation has indicated that the current uniform approach to non-residential wastewater charges was primarily based on the equity objective of not having country businesses "disadvantaged" relative to metropolitan businesses.

In 2002 the Expenditure Review Committee requested that the Minister for Government Enterprises establish a working group to examine alternatives to valuation-based charges for sewerage and drainage that included the options for country commercial wastewater charges.

In November 2002, the Joint Working Party considered a number of alternative options for country commercial wastewater pricing and recommended that it was most appropriate to introduce the metropolitan model for country customers. The rationale behind the recommendation was largely based on a preference for statewide uniform charging so that country businesses were not disadvantaged relative to metropolitan businesses, together with the recognition of the advantages of the metropolitan tariff structure over valuation based charges. The country commercial wastewater tariff reform was therefore introduced in 2003/04.

Additionally, it is noted that unlike water sources whose cost can vary enormously between schemes, the cost of wastewater services is generally comparable between country and metropolitan schemes.

(Water Corporation submission, p43-44)

The application of cost reflective charging should not necessitate the setting of one charge equal to another simply for administrative reasons.

In regards to the review of relative cost allocations and the subsequent, alternate pricing approaches potentially recommended by the ERA, the DTF requests that a range of options be presented to the Government. This is due in part to the varied nature of the structure of charges in these sectors and the potential for the transitional impacts to be substantial and produce unintended distortions across the sectors.

Furthermore, the ERA is requested to consider how these transitionary impacts could be averted or at least minimised through the use of a more targeted social policy mechanism, as outlined above.

(Department of Treasury and Finance submission, p15)

Assessment

The Authority considers that cost-reflective pricing should be the guiding principle to apply to commercial wastewater pricing. The consequence of applying uniform prices to country commercial wastewater customers, but scheme-based costs to country residential wastewater customers, is that commercial customers in some schemes may pay more than their fair share of the wastewater costs (while others in high cost towns may pay less than their fair share).

However, a cost-based approach would be more administratively burdensome because commercial wastewater tariffs would be required for each town. In addition, it is likely that a cap on commercial tariffs would be required (and possibly a minimum charge) for the same reason that a cap on commercial water tariffs is required – some towns are very expensive and an uncapped charge may be unreasonably high.

As for the metropolitan situation, the Authority compared two different options for the allocation of wastewater costs between country residential and non-residential customers.

- Option 1. Continue to allocate costs on the basis of existing relativities.
- Option 2. Set revenue shares for 2012/13 on the basis of estimated proportion of discharge to sewers, which would be more cost-reflective than the existing approach.

Table 11.1 shows the results of the two options. It can be seen that Option 2 (based on estimated discharge to sewers) would result in residential country wastewater charges remaining the same (with CSOs being higher) compared with the current approach, while commercial country wastewater charges would be $283 lower than under the current approach.

Table 11.2 Impact of Different Cost Allocation Approaches on Average Annual Wastewater Payments by Country Residential and Non-Residential Customers, Dollar Values in Real Dollars of June 2009

Country Wastewater Customers	Average Annual Payment		Change in Average Annual Payment Between 2009/10 and 2012/13	
	2009/10	2012/13	$	%
Option 1 – Costs Allocated on Basis of Current Tariff Structure				
Residential	553	632	26	5%
Non-Residential	1,105	1,153	16	1%
Option 2 – Revenue Shares in 2012/13 Reflect Proportion of Discharge				
Residential	553	632	26	5%
Non-Residential	1,105	870	-78	-8%

As indicated above, the Authority generally prefers to see tariffs set as cost-reflectively as possible (given administrative constraints). However, the Authority considers that designing a new charging approach for country non-residential wastewater customers would be complex (for example, minimum and maximum charges may need to be set) and should be a matter for consideration at the next regulatory review. The Authority considers that the more important reform over the next three years is to transition residential wastewater customers to an average flat charge for each scheme.

12 Revenue Requirements for Water Corporation, Aqwest and Busselton Water

The Authority's recommended revenue requirements for each of the water service providers are presented in this section. Note that the net revenue requirement and net cost of service are equal in net present value terms over the period 2005/06 to 2018/19.

12.1 Water Corporation

Table 12.1 Corporate Revenue Requirement, Value ($Million, Real Dollars of June 2009) – Water Corporation

Asset Account	2010	2011	2012	2013
Opening Asset Value	13,736.207	14,406.220	14,766.213	14,899.833
Capital Expenditure	1,029.029	744.556	535.628	622.600
Depreciation	-359.017	-384.562	-402.009	-412.266
Closing Asset Value	**14,406.220**	**14,766.213**	**14,899.833**	**15,110.166**
Cost of Service	**2010**	**2011**	**2012**	**2013**
Operating Expenditure	575.650	573.401	604.308	637.238
Depreciation	359.088	384.620	402.025	412.266
Return on Assets	909.250	953.597	977.423	986.267
Gross Cost of Service	**1,843.988**	**1,911.619**	**1,983.755**	**2,035.771**
Deferred & Transfer Revenue (annuity)	-93.5	-43.9	-79.1	-80.6
Government Cash Contribution (CSO)	-71.123	-44.170	-43.651	-42.008
Additional Revenue	-87.816	-83.337	-79.226	-77.526
Net Cost of Service	**1,591.494**	**1,740.163**	**1,781.804**	**1,835.710**
Revenue Requirement	**2010**	**2011**	**2012**	**2013**
Net Tariff Revenue	1,211.936	1,305.591	1,398.973	1,482.560
Discounts for Seniors	-58.965	-66.340	-70.078	-72.835
CSO Tariff Discounts	58.965	66.340	70.078	72.835
CSO Exempt Customers	28.066	26.729	25.326	23.852
CSO Non-Rated Property Discounts	8.949	9.240	9.485	9.749
CSO Transition / Losses	250.320	253.817	257.315	260.812
Net Revenue Requirement	**1,499.271**	**1,595.378**	**1,691.099**	**1,776.973**

12.2 Aqwest

Table 12.2 Corporate Revenue Requirement, Value ($Million, Real Dollars of June 2009) – Aqwest

Asset Account	2010	2011	2012	2013
Opening Asset Value	32,206.0	41,322.4	40,692.9	40,966.2
Capital Expenditure	9,964.0	451.1	1,421.3	412.7
Depreciation	-847.6	-1,080.5	-1,148.1	-1,132.5
Closing Asset Value	**41,322.4**	**40,692.9**	**40,966.2**	**40,246.4**
Cost of Service	**2010**	**2011**	**2012**	**2013**
Operating Expenditure	6,003.5	4,944.7	4,878.5	4,893.3
Return on Asset	2,300.5	2,951.7	2,906.7	2,926.2
Depreciation	847.6	1,080.5	1,148.1	1,132.5
Gross Cost of Service	**9,151.6**	**8,976.9**	**8,933.4**	**8,952.0**
Other Revenue	-640.7	-580.7	-634.5	-576.8
Net Cost of Service	**8,511.0**	**8,396.2**	**8,298.8**	**8,375.2**
Revenue Requirement	**2010**	**2011**	**2012**	**2013**
Net Tariff Revenue	**7,265.9**	**7,468.0**	**7,707.2**	**7,966.5**

12.3 Busselton Water

Table 12.3 Corporate Revenue Requirement, Value ($Million, Real Dollars of June 2009) – Busselton Water

Asset Account	2010	2011	2012	2013
Opening Asset Value	23,376.4	24,785.2	24,990.1	24,947.0
Capital Expenditure	1,947.7	792.4	564.3	1,492.4
Depreciation	-538.9	-587.5	-607.4	-621.5
Closing Asset Value	**24,785.2**	**24,990.1**	**24,947.0**	**25,818.0**
Cost of Service	**2010**	**2011**	**2012**	**2013**
Operating Expenditure	4,022.2	4,069.2	4,208.8	4,364.2
Return on Asset	1,669.8	1,770.4	1,785.1	1,782.0
Depreciation	538.9	587.5	607.4	621.5
Gross Cost of Service	**6,230.9**	**6,427.2**	**6,601.3**	**6,767.7**
Other Revenue	622.2	589.6	766.9	750.0
Net Cost of Service	**5,771.7**	**5,724.8**	**5,994.9**	**6,108.3**
Revenue Requirement	**2010**	**2011**	**2012**	**2013**
Net Tariff Revenue	**5,149.5**	**5,135.2**	**5,228.0**	**5,358.3**

13 Specific Tariff Recommendations for Each Service Provider

Recommendation

42) The tariffs of the Water Corporation, Aqwest and Busselton Water be set in accordance with the tariffs in Schedules 1, 2 and 3 of Appendix I.

PART THREE: IMPACTS OF TARIFF RECOMMENDATIONS

14 Impacts on Customers

The impacts on customers were discussed in section 2.6.4 as the social impacts guided the choice of tariff structure. More detailed tables showing the impacts on particular groups of customers, such as pensioners and tenants, are available in Appendix J. Impacts on a sample of commercial customers are presented in Appendix K. Impacts on Water Corporation country customers are shown in Appendix L.

15 Impacts on the Service Providers

15.1 Water Corporation

As shown in Table 15.1, the Water Corporation's gearing increases from 21 per cent to 29 per cent over the regulatory period. However, its net asset position (or equity) improves over this period. Net profit is between $492 million and $516 million per year.

Table 15.1 Summary Financial Indicators for the Water Corporation ($ Million, Nominal Dollars, Year Ending 30 June)

	2010	2011	2012	2013
Net Profit	511	516	513	492
Debt	2673	3034	3584	4274
Net Assets	9128	9299	9444	9574
Debt/Total Assets	21%	23%	26%	29%
Net Cash from Operating Activities	762	772	816	829
Net Cash Used in Investing Activities	-656	-788	-998	-1157

15.2 Aqwest

As shown in Table 15.2, Aqwest's net profit varies from $0.69 million to $1.5 million per year over the regulatory period. Its net assets increase and its gearing is kept at 1 per cent or below.

Table 15.2 Summary Financial Indicators for Aqwest, ($ Million, Nominal Dollars, Year Ending 30 June)

	2010	2011	2012	2013
Net Profit	0.693	1.091	1.318	1.517
Debt	0.935	0.898	0.862	0.827
Interest bearing assets	-	1.139	1.519	3.132
Net Assets	77.320	78.410	79.729	81.245
Debt/Total Assets	1%	1%	1%	1%
Net Cash from Operating Activities	1.923	2.654	2.937	3.222
Net Cash Used in Investing Activities	-10.889	-1.477	-2.521	-1.574

15.3 Busselton Water

As shown in Table 15.3, Busselton Water's net profit ranges from $0.73 million to $0.86 million over the regulatory period. Its net assets increase and it requires a level of debt in 2013 that results in a gearing of 3 per cent.

Table 15.3 Summary Financial Indicators for Busselton Water, ($ Million, Nominal Dollars, Year Ending 30 June)

	2010	2011	2012	2013
Net Profit	0.729	0.762	0.864	0.813
Debt	-	-	-	2.000
Interest bearing assets	7.930	8.024	8.142	7.163
Net Assets	49.804	50.566	51.430	52.243
Debt/Total Assets	0%	0%	0%	3%
Net Cash from Operating Activities	1.721	1.694	1.720	1.771
Net Cash Used in Investing Activities	-2.370	-1.600	-1.602	-2.750

16 Impacts on Government Finances

16.1 Water Corporation

Table 16.1 shows the impacts on the Consolidated Fund under the tariff proposals for the Water Corporation. The table shows that annual net payments to government are expected to be the equivalent of $197.6 million over the three years of the regulatory period, in comparison to an estimated $162.1 million in 2009/10. The higher net payments are largely the result of lower CSO payments resulting from higher tariff revenues in the country from more cost-reflective water and wastewater charges.

Table 16.1 Impacts on Government Finances by the Water Corporation ($ Million, Nominal Dollars, Year Ending 30 June)

	Estimated annual payments for 2009/10	Annual equivalent payments for the period 2010/11 to 2012/13
Dividend payments	350.8	357.8
Tax equivalent payments	219.0	217.6
CSOs	-407.7	- 377.8
Net payments to government	**162.1**	**197.6**

16.2 Aqwest

Table 16.2 shows the impacts on government finances from applying the tariff recommendations to Aqwest. Aqwest does not make any dividend payments. However, it does make tax equivalent payments to the State government and receives a small payment from the State Revenue Office for providing rebates to Seniors. Net payments to government increase from an estimated $0.287 million in 2009/10 to $0.546 million on average for the regulatory period.

Table 16.2 Impacts on Government Finances by Aqwest ($ Million, Nominal Dollars, Year Ending 30 June)

	Estimated annual payments for 2009/10	Annual equivalent payments for the period 2010/11 to 2012/13
Dividend payments	0.000	0.000
Tax equivalent payments	0.297	0.555
Receipts from State Revenue Office	-0.010	-0.009
Net payments to government	**0.287**	**0.546**

16.3 Busselton Water

Table 16.3 shows the impacts on government finances from applying the tariff recommendations to Busselton Water. As with Aqwest, Busselton Water does not make any dividend payments. However, it does make tax equivalent payments to the State government and receives a small payment from the State Revenue Office. Net payments to government are expected to increase from an estimated $0.299 million in 2009/010 to $0.337 million on average over the regulatory period.

Table 16.3 Impacts on Government Finances by Busselton Water ($ Million, Nominal Dollars, Year Ending 30 June)

	Estimated annual payments for 2009/10	Annual equivalent payments for the period 2010/11 to 2012/13
Dividend payments	0.000	0.000
Tax equivalent payments	0.313	0.348
Receipts from State Revenue Office	-0.013	-0.011
Net payments to government	**0.299**	**0.337**

APPENDICES

17 Appendix A. Terms of Reference

INQUIRY INTO TARIFFS OF THE WATER CORPORATION, AQWEST AND BUSSELTON WATER

I, ERIC RIPPER, Treasurer and pursuant to section 32(1) of the *Economic Regulation Authority Act 2003* request that the Economic Regulation Authority (the Authority) undertake an Inquiry into the tariffs of the Water Corporation (as established by the *Water Corporation Act 1995*) the Bunbury Water Board (Aqwest) and the Busselton Water Board (as established by the *Water Boards Act 1904*).

In doing so, the Authority is to investigate and report on the following matters:

- the appropriate charging structures and recommended tariff levels for the Water Corporation, Aqwest and the Busselton Water Boards' water supply services;
- the appropriate charging structures and recommended tariff levels for the Water Corporation's wastewater services;
- the appropriate charging structures and recommended tariff levels for the Water Corporation's drainage services;
- the appropriate charging structures and recommended tariff levels for the Water Corporation's other regulated services.

The Authority must give consideration to, but will not be limited to, the following:

- the method used to determine the revenue requirements of each service provider;
- the operating and capital costs of providing services, with a focus on:
  - cost effectiveness in the supply of services; and
  - resources necessary to meet the required service standards.
- the appropriate rate of return on each service provider's assets;
- the efficiency of demand management activities;
- the impact of the recommendations on each service provider's net financial position;
- the impact of the recommendations on the Government's net financial position, in particular, net debt, dividends, tax equivalent payments and the level of Government funding (through Community Service Obligation Payments); and
- the environmental and social impact of the recommendations.

In developing its recommendations, the Authority is to have regard to the following policies:

- the pricing principles of the 1994 Council of Australian Governments water reform agreement and the National Water Initiative;
- the Western Australian State Government's Uniform Pricing Policy;
- the Western Australian State Government's Sustainability Policy;
- the Western Australian State Government's Community Service Obligations Policy; and

- the pricing mechanisms available to the utility service providers through the *Water Agencies (Powers) Act 1984* and the *Water Boards Act 1904*.

The Authority will release an issues paper as soon as possible after receiving the terms of reference. The paper is to facilitate public consultation on the basis of an invitation for written submissions from industry, government and all other stakeholders groups, including the general community.

A report is to be made available for further public consultation on the basis of an invitation for written submissions. A final report is to be completed by close of business, no later than 15 June 2009.

[Note that the Terms of Reference was subsequently revised to provide for a final report by 14 August 2009.]

18 Appendix B. Description of the Water Corporation, AQWEST and Busselton Water

The Water Corporation

The Corporation is a statutory corporation operating under the *Water Corporation Act 1995*. The Corporation was established as a commercially focused utility on 1 January 1996 following a restructuring of the water industry that also saw the roles of water resource manager (now the Department ofWater) and regulator (now the Authority) separated from the functions of the utility. The Corporation is governed by a Board of Directors acting in accordance with Corporations Law, and the Board is accountable to the Minister responsible for the *Water Corporation Act 1995*.

The Corporation is a vertically integrated water and wastewater business. It was established in 1995 and given the task of providing "sustainable water services to make Western Australia a great place to live and invest".[73] Prior to the creation of the Corporation, water and wastewater services were provided directly by the Western Australian Government. In undertaking the tasks associated with water and wastewater services, the Corporation must comply with the relevant health and environmental regulations.

The prices the Corporation charges for its services are determined by the Western Australian Government. In making its final determination of prices, the Government takes into account advice that is provided to Government through public processes by the Authority.

During the 2007-08 financial year, the Corporation had revenues of approximately $1.67 billion (including $399 million from the Western Australian Government for the provision of community service obligations) and an after-tax profit of $527 million. A dividend of $391 million was paid to the Western Australian Government, the Corporation's owner.[74]

AQWEST

Bunbury Water Board, trading as AQWEST is a statutory authority established under the *Water Boards Act 1904*. The Bunbury Water Board was established in 1905 and was operated in association with the Bunbury local government authority until 1997 when it was re-formed as a separate entity.

AQWEST provides potable water services to the Bunbury-Wellington region, including water sourcing, treatment, distribution and retailing operations. Water is sourced from the Yarragadee aquifer through 13 production bores and supplied to about 14,000 connections through 332 kilometres of water mains. About 72 per cent of water produced is supplied to residential customers and the remaining 28 per cent is supplied to non-residential customers. AQWEST does not provide wastewater services, which in AQWEST's region of operation are provided by the Corporation.[75]

[73] http://www.watercorporation.com.au/C/company_index.cfm?uid=6135-9990-9046-5900

[74] Water Corporation Annual Report 2007, pp 68 - 73.

[75] ERA, *Final Report on the Inquiry on Urban Water and Wastewater Pricing,* November 2005, pg 117.

During 2007-08, AQWEST had total income of approximately $10 million and an after-tax profit of approximately $1.1million.[76]

Busselton Water

The Busselton Water Board, trading as Busselton Water, is a statutory authority established under the *Water Boards Act 1904*. The Busselton Water Board was established in 1906. Busselton Water is governed by a Board of Directors appointed by the Minister for Water and acting under powers created by the *Water Boards Act 1904*.

Busselton Water provides a potable water service to the town of Busselton and to surrounding areas, including water sourcing, treatment, distribution and retailing operations. Water is sourced from the Yarragadee aquifer through 8 production bores and supplied to about 8,700 connections through 232 kilometres of water mains. About 82 per cent of water produced is supplied to residential customers and the remaining 18 per cent supplied to non-residential customers. The business has an employee workforce of around 23 full-time-equivalent staff. Busselton Water does not provide wastewater services, which in Busselton Water's region of operation are provided by the Corporation.[77]

During 2007-08, Busselton Water had total income of approximately $6 million and an after-tax profit of approximately $3 million.[78]

[76] AQWEST *Annual Report 2007*, p22.

[77] ERA, *Final Report on the Inquiry on Urban Water and Wastewater Pricing,* November 2005, pg 151.

[78] Busselton Water *Annual Report 2007*, Financial Statements p2.

19 Appendix C. Tariff Structures 2008-09

This appendix explains how tariffs are currently set for water, wastewater, and drainage.[79] The tariffs listed are for the 2008-09 period.

Metropolitan Water

Method

- The metropolitan water accounts determine the cost of service to be recovered from metropolitan water customers.
- This cost is apportioned between residential and non-residential customers on the basis of the allocation that existed in 2005.

Tariffs

- For metropolitan residential customers, usage charges increase in four steps as usage increases (from $0.64 per kL to $1.71 per kL):
  - charges for volumes up to 950 kL per year are being phased-in to the estimate of LRMC that the Authority recommended to the Government in 2005 ($0.89 per kL). The phase-in will be complete by 2013/14. Charges for usage above 950 kL will remain at $1.71 per kL (adjusted for inflation).
  - Residential customers also make an annual payment of $180.50.
- For metropolitan non-residential customers, charges are $0.98 per kL up to 600 kL, then $1.04 per kL up to 1,100,000 kL then $1.03 per kL.
  - These charges are being phased-in to $1.71 per kL by 2013/14.
- Non-residential fixed charges are based on meter size, ranging from $500 for a 20mm meter to $153,000 for a 350mm meter.

Country Water – Water Corporation Customers

Method

- The country water accounts determine the cost of service to be recovered from country water customers.
- Country towns are grouped into five groups for the purpose of residential charging.
  - The grouping is done on the basis of net demand cost per kL of each town.[80]
  - Towns are allocated to 15 groups for the purpose of non-residential charging. The reason for more groups for non-residential customers is to minimise the jump in charges that would otherwise occur when towns are reassigned to a higher group (residential customers are insulated due to the uniform pricing policy).

[79] Other regulated tariffs of the Corporation are outlined in Appendix D.

[80] Net demand cost per kL = (gross cost of service – non-regulated revenue – fixed revenue) / (commercial volume + residential volume). The thresholds for allocating towns to groups are calculated as the average of two adjacent usage charges (which results in a town being assigned the tariff that most closely relates to its net demand cost per kL).

Tariffs

- Residential customers pay the metropolitan fixed charge and metropolitan usage charges up to 300 kL in the South (500 kL in the North).
- Tariffs are being transitioned to a four-tier structure:
  - tier 1 is the uniform tariff;
  - tier 4 is the lower of the net demand cost per kL for the group of towns or the cap, which is set at $5 in real dollars of 2006;
  - the tariff for tiers 2 and 3 are calculated on the basis that the percentage increase between tiers is constant.[81]
- Non-residential customers pay a single usage charge (equal to the Tier 4 charge). The Government decided to not have CSOs go to non-residential country customers. The fixed tariffs are the same as non-residential metropolitan fixed tariffs.

Country Water – AQWEST Customers

Method

- AQWEST's tariffs are currently set on the basis that their tariffs are maintained at constant values in real terms.

Tariffs

- Charges to residential customers increase in five steps as usage increases (from $0.42 per kL to $2.55 per kL).
- Residential customers also make an annual payment of $100.00.
- For non-residential customers, charges are currently $0.67 per kL up to 1000 kL and $1.00 per kL above that level of usage.
- Non-residential fixed charges are based on meter size, ranging from $299.20 for a 20mm meter to $16,830.00 for a 150mm meter.

Country Water – Busselton Water Customers

Method

- Busselton Water's tariffs are currently set on the basis that their tariffs are maintained at constant values in real terms.

Tariffs

- Charges to residential customers increase in five steps as usage increases (from $0.44 per kL to $2.65 per kL).
- Residential customers also make an annual payment of $113.20.

[81] The implication of this method is that tariffs will only change if either the uniform tariff changes or the cap changes. However, if a town's net demand cost per kL changes significantly (in real terms), then it would be reclassified to a different group.

- For non-residential customers, charges are currently $0.81 per kL up to 1000 kL and $1.15 per kL above that level of usage.
- Non-residential fixed charges are based on meter size, ranging from $362.35 for a 20mm meter to $20,307.10 for a 150mm meter.

Metropolitan Wastewater

Method

- The metropolitan wastewater accounts determine the cost of service to be recovered from metropolitan wastewater customers.
- Cost increases are apportioned between residential and non-residential customers on the basis that the current relativity (that from 2004/05) is maintained.

Tariffs

- Residential wastewater charges:
  - Based on gross rental value and a rate in the dollar of GRV.
  - The current tariffs are 4.75 cents for each dollar of the first $12,400 of the rateable value and 1.62 cents for each dollar thereafter.
  - Range from a minimum of $275.90 per year. There is a maximum charge of $687.50 per year for country customers, but no maximum for metropolitan customers.
- Non-residential wastewater charges:
  - Fixed charge is based on number of fixtures (toilets and urinals) – assumed to grow at a certain rate. The fixed charge is cumulative with charges declining and then increasing per additional fixture.
  - Usage charge is based on estimated discharge of water consumption. The discharge factor is based on the average discharge for the year.

Country Wastewater

Method

- The country wastewater accounts determine the cost of service to be recovered from country wastewater customers.
- Costs are determined on an individual scheme basis.
- The costs are apportioned between residential and non-residential customers on the following basis:
  - non-residential revenue can be determined because the charges are set at the same levels as for metropolitan wastewater customers; and
  - the non-residential revenue is subtracted from the scheme cost to determine the revenue requirement for residential customers.[82]

[82] Note that non-regulated revenue is also taken into account in determining the revenue requirement from country residential wastewater customers.

Tariffs

- Residential wastewater charges:
  - there is a minimum and maximum charge;
  - there is a maximum rate in the dollar of GRV (12 cents per dollar of GRV); and
  - charges are being transitioned to be cost reflective (subject to the maximum charge and maximum rate in the dollar of GRV).
- Non-residential wastewater charges:
  - Country fixed and usage charges are the same as metropolitan charges.

Metropolitan Drainage – Water Corporation Customers

Method

- The metropolitan drainage accounts determine the cost of service to be recovered from customers.

Tariffs

- Metropolitan customers pay for drainage on the basis of GRV:
  - 0.501 cents per dollar of GRV for residential customers;
  - 0.603 cents per dollar of GRV for non-residential customer; and
  - a minimum of $63.10 for all customers.
- Note that this is the first time the Authority has been asked to consider drainage tariffs.

Country Drainage

Method

- The country drainage accounts determine the cost of service.

Tariffs

- Country customers are not charged for drainage services. The cost is met entirely by a CSO.

20 Appendix D. Tariff Structure 2008-09 – Other Regulated Tariffs of the Water Corporation

Water Tariffs

A wide range of variations to the standard residential by-law fixed charges apply (compared to the standard residential fixed charge of $180.50):

- Land provided in one pilot metro suburb solely for garden purposes is charged an additional fixed charge (either $65.15 or $130.30 depending on the size of the land) for non-potable supplies;
- Various customers in the metro area provided with exemptions to the fixed charge (e.g. land belonging to a religious body, land used as a public hospital, public school, public library, public museum, public art gallery, land used for charitable purposes, not for profit entities such as sporting clubs, societies and associations, land used for horse racing, greyhound racing and trotting, cemeteries);
- Strata-titled or long term residential caravan bays ($126.80);
- Community residential, which is land occupied as a communal property on which several family units dwell at the same time and is managed by the persons dwelling on the land or a committee of them ($90.25 for each notional residential unit). The community residential charges is based on the residential charge, with a built in 50 per cent concession, recognising that most residents are welfare recipients (pensioners).

A range of variations to the standard residential usage charges apply (compared to the standard metro residential usage charges of $0.643, $0.828, $0.997, $1.423, $1.714):

- Community residential ($0.321, $0.828 then the same, for metro community residential). As with the service charge, the community usage charge is based on the standard charge with a 50 per cent discount built in which recognises that most residents are welfare recipients;
- For strata titled caravan parks in the metro area, each bay pays $0.643 for first 150kL then a rate linked to the highest non-residential metro usage charge ($1.043);
- For strata titled caravan parks in the non-metro area, each bay pays $0.643 for first 150 kL then the highest non-residential usage charge for the town class.

A range of variations to the standard metropolitan non-residential usage charges (compared to metro prices of $0.983, $1.043, $1.028):

- Commercial residential charges for dual use residential and non-residential properties. The first 150kL is charged at residential prices, recognising the residential component of water use;
- Metro farmland ($108.3);

Non-residential non-metropolitan:

- Mining customers ($1.889);
- Farmland ($1.083);
- Institutional public, charitable ($1.042, $1.697);

- Local government standpipes ($1.083);
- Stock watering ($1.083);
- Metropolitan hydrant standpipes ($1.043).

Wastewater Tariffs

A range of variations to the variable metropolitan by-law charges apply:

- Various customers in the metro area are provided with exemptions or discounts to the fixed charge (e.g. land belonging to a religious body, land used as a public hospital, public school, public library, public museum, public art gallery, land used for charitable purposes, not for profit entities such as sporting clubs, societies and associations, land used for horse racing, greyhound racing and trotting, cemeteries). Exemptions apply to all classifications (residential, commercial and vacant land). The exemption is from availability based charges with these customers paying a fixed charge for each fixture connected to sewer;
- In all other cases, a charge equal to the number of fixtures multiplied by $163.30.

Country exempt:

- Institutional public ($163.30 for the first major fixture and $71.80 for each additional fixture thereafter);
- Charitable purposes ($163.30 for the first major fixture and $71.80 for each additional fixture thereafter);
- Community residential ($71.80);
- General exempt - as with institutional public.
- Caravan bay ($200.70);
- Strata-titled storage unit and strata-titled parking bay ($60.15);
- Non-residential strata-titled units pay either commercial charges (based on major fixtures) or the shared fixture charge (the charge for four or more fixtures);
- Land from which industrial waste is discharged into a sewer of the Corporation ($187.70);

Variable charges for residential properties are determined using an amount for each dollar of the Gross Rental Value of the property:

- Up to $9,300 (4.75 cents/$ of GRV);
- Over $9,300 (1.62 cents/$ of GRV);
- Subject to a minimum ($275.90).

Vacant metropolitan non-residential not being land comprised in a residential property, a nursing park home, a caravan park, a connected metropolitan except (?) or a strata-titled caravan bay:

- An amount of 1.530 cents/$ of GRV;
- Subject to a minimum in respect of any vacant land the subject of a separate assessment ($207.50).

A range of variations apply in respect to wastewater charges for country areas. The rates are determined using a table in the *Water Agencies (Charges) By-laws 1987* using an amount for each dollar of the GRV of the property. The rates are subject to a minimum:

- in the case of land classified as residential ($275.90);
- in the case of land classified as vacant land ($181.60);
- in the case of land not classified as residential or vacant land ($607.90);
- subject to a maximum in respect of any land classified as residential or classified as vacant land and held for residential purposes ($687.50).

Industrial Waste Tariffs

Industrial waste discharged into the sewer of the Corporation pursuant to a major permit is uniform state-wide, charged based on the volume of discharge together with composition of the discharge and the quantity of contaminants in the discharge:

- For volume (111.0 c/kl);
- A range of charges from no charge for sulphate discharge with a concentration of up to 0.05 kg per kL or dissolved salts discharge with a concentration up to 1 kg per kL up to a charge of 342,465 c/kg for mercury discharge with a concentration of over 0.001 kg per day.

A range of service charges exist for industrial waste:

- Permit fee ($187.70);
- Meter reading ($21.20);
- Establishment fee – routine program or unscheduled visit ($105.50/hour);
- Inspection fee – routine program or unscheduled ($116.05/hour);
- Production evaluation – routine program – N/A;
- Production evaluation – unscheduled visit ($132.40/hour);
- Grab samples – routine program ($246.95);
- Grab samples – unscheduled visit (at cost);
- Composite samples – routine program ($579.70);
- Composite samples – unscheduled visit (at cost);
- Non-permit holders discharging industrial waste ($105.50/hour);
- Discharging industrial waste from an open area ($1.25/square metre);
- Fats, oils and grease management charge ($87.50), introduced in 2008/09.

Drainage

- Drainage charges are calculated based on either fixed charges or variable charges.
  - Fixed charges apply for a strata-titled caravan bay ($18.95) or strata-titled storage unit and strata-titled parking bay ($7.80).
  - Variable charges apply in all other circumstances and is calculated using an amount for each dollar of the gross rental value of the property:

- Land in a drainage area within the meaning of the *Metropolitan Water Authority Act 1982* classified as residential or semi-rural residential (0.501 cents/$ of GRV subject to a minimum of $63.10);
- Land in a drainage area classified as vacant land (0.400 cents/$ of GRV subject to a minimum of $63.10);
- Land in a drainage area within the meaning of the *Metropolitan Water Authority Act 1982* other than those mentioned above (0.603 cents/$ of GRV subject to a minimum of $63.10).

Discounts and Additional Charges

- Discount if an account is paid on or before 31 July in the year the charge was incurred ($1.50);
- Additional charges ranging from $1.50 to $3.00 if instalment payment arrangements are made with the Corporation (does not apply to pensioners or seniors);
- Two different rates of interest are applicable to outstanding amounts as a result of special payment arrangements made with the Corporation (5.36 per cent per annum and 6.36 per cent per annum);
- Concession charges apply for retirement village residents who were liable for a charge prior to 1 July 2005 and that person is also liable to pay a charge after 1 July 2005. The concession to be allowed is 25 per cent of the charge, or the amounts set out below, whichever is the lesser amount:
  - Charge for water supply ($78.95);
  - Charge for sewerage ($156.00);
  - Charge for drainage ($16.50).
  - Interest on overdue amounts (13.99% per annum).

Water Supply Charges for Government Trading Organisations and Non-commercial Government Property

Government trading organisations and non-commercial Government property are subject to an annual fixed charge based on the meter size and subject to a minimum charge where the meter is not served by the Corporation. Charges are based on service connection (as with exempt properties generally) rather than service availability;

- Meter size of 20mm or less ($500.30);
- Meter size of 350mm ($145,216);
- Minimum charge ($500.30).
- A volumetric charge for metropolitan users for:
  - The first 600 kL (98.3 cents);
  - 601 kL to 1,100,00 kL (104.3 cents);
  - Over 1,100,000 kL (102.8 cents).
- A volumetric charge for country users according to the town/area in which the property is situated:
  - Up to 300 kL (104.2 cents kL to 375.7 cents kL;
  - Over 300 kL (169.7 cents kL to 559.1 cents kL).

21 Appendix E. Calculating the Short Term Value of Water

21.1 Introduction

This appendix provides a method for calculating the short term value of water in Perth. It describes a hypothetical wholesale water market which has been based on the Western Australian wholesale electricity market (WEM). In the WEM, the absence of sufficient generators to form a competitive market is dealt with by requiring each generation company to offer their generated electricity at short run marginal cost, which is the cost associated with increasing production of electricity by one unit.

A similar approach can be applied to water sources. The market clearing price can be identified for each of the next five years by finding the offer (or water source, with an associated short run marginal cost of water supply) that intersects an assumed demand schedule for water.

This model provides information that can assist (along with other information, such as long run marginal cost) with setting water usage charges in Perth.

21.2 Overview of the Market

The hypothetical wholesale water market has been 'designed' to operate as follows:

- The market is for the year ahead and occurs just after the winter rains, say at the end of October. (Almost all of the dam inflows for Perth occur over winter.) The main difference between water and electricity is that water can be stored. The implication of storage is that a market for water could occur less frequently than a market for electricity, say once per year rather than once per day.
- The supply schedule is set on the basis of each available source being offered at its short run marginal cost. The water sources in the supply schedule are arranged in increasing order of their short run marginal costs (from the cheapest to the most expensive source). As in the electricity market, sources cannot be withheld from the water market as this could constitute a misuse of market power.
  - Short run marginal costs are those costs which are incurred to produce an extra unit of water in the short run. These include short-run operating costs, such as pumping and the operating costs of desalination, but do not include long-run costs involving capacity expansion.
- The demand schedule reflects bids for non-discretionary water, discretionary water and security (this is the amount of water that would ideally be retained in the dams at the end of each year to secure the system).
- The market clearing price is determined at the point where the demand schedule intersects the supply schedule.

Certain assumptions have been made in the model about the supply and demand schedule.

Supply

The following offers have been assumed (based on the short run marginal cost of each source):

- dams: $0.10 per kL for all available water in the dams;[83]
- groundwater: $0.20 per kL for the first 117 GL then $2 per kL for up to 25 GL;
- irrigation dams: $0.25 per kL for 13 GL;
- desalination 1: $0.31 per kL for 45 GL; and
- desalination 2: $0.45 per kL for 20 GL from 2011/12 and for 50 GL from 2012/13.

The offer of groundwater above 117 GL is priced at $1.99 per kL, just below the opportunity cost of this groundwater, which is assumed to be the price at which demand is the equivalent of two day per week restrictions ($2.00 per kL).[84]

In order to test the impact on price of an assumed groundwater externality prior to the availability of water from the second desalination plant, the model can also be run to cap groundwater abstraction at 120 GL for the period up to 2012/13.

It has been assumed that a further major augmentation will not be required in the five year period under consideration (other than the second desalination plant).

Demand

The demand schedule reflects bids, in order of priority, for non-discretionary water, security and discretionary water.

The highest bid is to provide for non-discretionary water (the level consistent with a total sprinkler ban). This demand is assumed to be 250 GL in 2008/09 and increasing at 1.6 per cent per year. The bid is assumed to be $3 per kL.

For the security bid, it has been assumed that:

- the security target is to retain enough water in the dams at the end of each year to ensure 'saturated' demand will be met in the following year even if zero inflows occur. Saturated demand is defined as 30 per cent above the level of demand that would occur under a total sprinkler ban.
  - This assumption results in the probability of a total sprinkler ban being a 1 in 50 year event after water from the second desalination plant is available.
- the only non-dam water that will be available for the following year is 120 GL of groundwater, desalinated water and water from existing trades between the Water Corporation and Harvey Water;
- the bid is $2.99 per kL.

For the discretionary water bid, the demand schedule is assumed to have the following characteristics:

- retail demand equivalent to demand under a total sprinkler ban is achieved by setting the price at $3 per kL;

[83] It is assumed that 110 GL of water in the dams is unavailable.

[84] 117 GL was chosen so that over time groundwater abstraction averages 120 GL (given the potential to have an offer for additional groundwater accepted if the price goes above $2 per kL).

- retail demand has an elasticity of -0.1, which means that for every 10 per cent reduction in the price below $3, the demand for water increases by 1 per cent; and
- retail demand is saturated at a point that is 30 per cent above the level of demand equivalent to a total sprinkler ban.

Prior to the commencement of the regulatory period in 2010/11, the discretionary water bid is assumed to be $3 per kL for 29 GL per year (to provide for demand equivalent to two day per week restrictions). As will be illustrated in the next section, if this constraint is not imposed, the model would not make this level of discretionary water available in those years and would result in dam storages being unreasonably high at the commencement of the regulatory period.

21.3 Illustration of How the Market is Solved

If the market were to operate for one year ahead, it would be solved in a straightforward manner because all of the offers and bids would be independent and known (the market takes place after the winter rains). The offers would be stacked from low to high, the bids would be stacked from high to low, and the market clearing price would be determined as the intersection of the supply and demand schedules.

However, for the purpose of looking ahead five years, the offers of dam water and the security bids are unknown. The model needs to be run as a simulation model to reflect the possible distribution of inflows.[85] The resulting dam storages can then be used to identify the offers of dam water and the security bids.

Table 21.1 illustrates how the security bid is calculated for a particular inflow sequence and particular year (ignoring at this stage the possibility of an environmental externality for groundwater abstraction). Look first at the bottom half of year 2 in the table. In that year, saturated demand is expected to be 330 GL and it is expected that there is 120 GL of groundwater, 45 GL of desalinated water, 13 GL of traded water and 0 GL of inflows (i.e. assuming a “worst case scenario”). This leaves a residual of 152 GL which would ideally be available in the dams at the end of year 1.

The same method of calculating the security bid applies for the other years.

It may be noted that the October dam storage in Table 21.1 is always assumed to be the storage based on the particular inflow assumption rather than the storage that would result from not having any inflows.

[85] The model has been run using 200 simulations of inflows, based on a distribution of inflows to replicates the period from 2001 to 2007.

Table 21.1 Security Bid Calculation for 2008/09 – 2012/13 (GL)

	Year 1 2008-09	Year 2 2009-10	Year 3 2010-11	Year 4 2011-12	Year 5 2012-13
October Dam Storage	150	214	155	232	223
Less dispatched dam storage	-150	-214	-155	-232	-223
plus inflows	0	0	0	0	0
plus security bid	152	157	143	118	124
September Dam Storage	152	157	143	118	124
Saturated demand	325	330	335	341	346
less groundwater	-147	-120	-120	-120	-120
less desalination	-45	-45	-45	-65	-95
less traded water	-13	-13	-13	-13	-13
less inflows	0	0	0	0	0
Residual	120	152	157	143	118

Now that the security bids have been identified, the model can be solved to determine the actual security purchase, level of non-discretionary demand and market clearing price. These values are shown in Table 21.2.

Table 21.2 shows that the security purchase required to achieve the security target is not fully available in the first three years (under this scenario). Whenever the security target cannot be achieved the price of water is generally assumed to be $2.99 per kL (the opportunity cost of not securing enough water is the equivalent of a total sprinkler ban). However, for the first two years the model has been modified because the resulting price is less important than calibrating the model to have an appropriate dam storage starting point for year 3. The modification to the model has been to achieve a level of demand that is consistent with two day per week restrictions (the security purchase has been reduced to provide for this demand).

From year 3 the standard assumption that the security target has priority over non-discretionary demand is resumed. In this particular scenario, there is no non-discretionary demand in year 3 because the security target cannot be achieved (the inflows in the previous year were very low – see Table 21.3). The price is year 3 is therefore $2.99 per kL.

From year 4, the security target is achieved and non-discretionary demand is provided for. In this particular scenario the price drops to $0.92 per kL in 2011/12 and then to $0.75 per kL in 2012/13.

Table 21.2 Security Purchase and Non-discretionary Demand Calculation for 2008/09 – 2012/13 (GL)

	Year 1 2008-09	Year 2 2009-10	Year 3 2010-11	Year 4 2011-12	Year 5 2012-13
Price	**2.99**	**2.78**	**2.99**	**0.92**	**0.75**
Non-discretionary demand	250	254	258	262	266
Security purchase	76	131	97	118	124
Discretionary demand	29	29	0	47	57
Total Demand	**355**	**414**	**355**	**427**	**447**
Dams	150	214	155	232	223
Groundwater	147	142	142	117	117
Water trade	13	13	13	13	13
Desal 1	45	45	45	45	45
Desal 2	0	0	0	20	49
Total Supply	**355**	**414**	**355**	**427**	**447**

The information above is presented graphically in Figure 21.1 for year 4 of the model (2011/12). The demand curve and supply curve intersect at $0.92 per kL.

Figure 21.1 Demand and Supply Curve for 2011/12

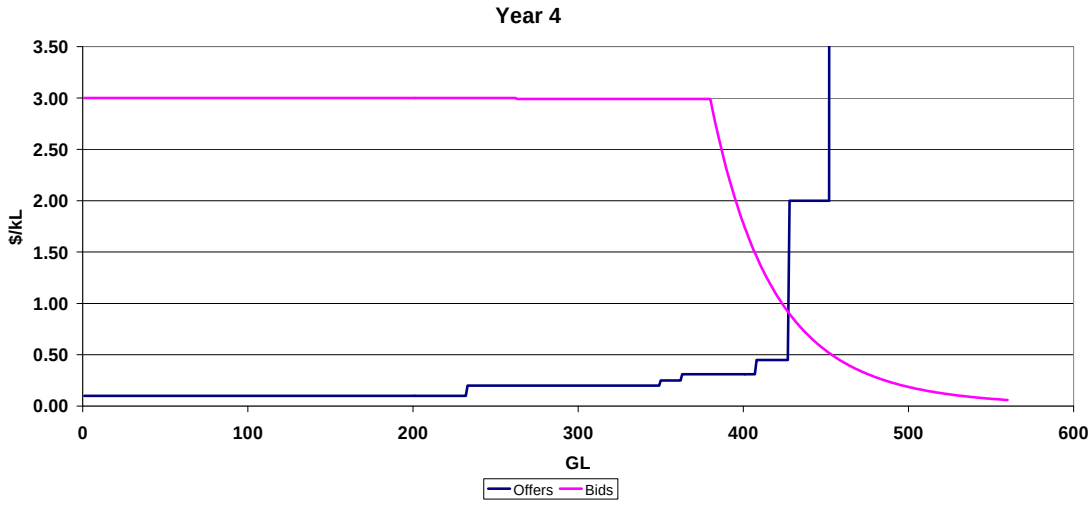


Table 21.3 illustrates the dam storage position for the five year period. For the given inflow sequence and for the actual security purchases it can be seen that dam storage reduces to a low of 155 GL in 2009/10 (under this particular inflow sequence) but is at 242 GL by the end of year 5.

Table 21.3 Dam Storage Position for 2008/09 – 2012/13 (GL)

	Year 1 2008-09	Year 2 2009-10	Year 3 2010-11	Year 4 2011-12	Year 5 2012-13
October Dam Storage	150	214	155	232	223
less dispatched dam storage	-150	-214	-155	-232	-223
plus inflows	138	25	135	104	118
plus security purchase	76	131	97	118	124
September Dam Storage	214	155	232	223	242

21.4 Short Term Value of Water

The scenario above illustrated the price path for a particular inflow sequence. If the model is run over 200 sequences, the resulting prices are as shown in Table 21.4. The table shows the prices with and without the externality for groundwater abstraction (the externality is modelled by not providing for more than 120 GL of groundwater in the years leading up to the second desalination plant in year 4).

Table 21.4 Average Prices for 2008/09 – 2012/13 ($ per kL)

	Year 1 2008-09	Year 2 2009-10	Year 3 2010-11	Year 4 2011-12	Year 5 2012-13
Price path without externality	$2.99	$2.77	$2.28	$1.26	$0.99
Price path with externality	$2.99	$2.85	$2.56	$1.65	$1.10

Given that the regulatory period is for the years 2010/11 to 2012/13, the Authority is particularly interested in the value of water over those three years. The discounted weighted average tariff for those three years without the externality is $1.48 per kL and with the externality is $1.72 per kL.

The model has also been run to test the sensitivity of the prices to variations in two of the key assumptions: the elasticity of demand and the level of groundwater abstraction from 2011/12.

- If the elasticity of demand is changed from -0.1 to -0.2, and the price that represents a total sprinkler ban changed from $3 to $2 per kL, the resulting discounted weighted average tariff is $1.42 per kL.
- If the groundwater abstraction is changed to a flat 110 GL (instead of 120 GL) at $0.20 per kL up to 2011/12 and then 107 GL (instead of 117 GL) at $0.20 per kL and 25 GL at $2 per kL, the resulting discounted weighted average tariff is $1.91 per kL.

Table 21.5 Price Path with Externality for Alternative Elasticity and Groundwater Abstraction Assumptions ($ per kL)

	Year 1 2008-09	Year 2 2009-10	Year 3 2010-11	Year 4 2011-12	Year 5 2012-13
Elasticity = -0.2 Highest price = $2 per kL	$1.99	$1.94	$1.81	$1.38	$1.13
Groundwater abstraction from 2011/12 = 110 GL + 25 GL	$2.99	$2.89	$2.72	$1.95	$1.23

21.5 Submissions

After considering the version of the model presented in the Draft Report, the Water Corporation and the Department of Treasury and Finance concluded that modelling the short term value of water was complex and that there was insufficient time to develop the model during the course of this inquiry. Instead, the model development should occur in time for the next review of the Water Corporation's tariffs.

> From a practical perspective, the ERA's proposed SRMCP model is not well specified, calibrated or tested, and provides highly unstable results under a wide range of foreseeable circumstances. Without a strong theoretical driver, adopting a methodology that has a high probability of being abandoned at the next price review (due to the potential for unreasonably high or low prices) is not good regulatory practice. (Water Corporation submission on Draft Report, Part A, p3)

> The proposed wholesale market model is not supported at this time. Analysis of the model suggests that its short term focus produces significant fluctuations in tariff levels from year to year which is counter to the preference for reduced uncertainty where possible. Furthermore, the development of a pricing methodology based on a theoretical wholesale market with very little relevance to the Western Australian water industry at this time does not appear appropriate. (Department of Treasury and Finance submission on Draft Report, p1)

Specifically, three main weaknesses of the model were identified:

- The Department of Treasury and Finance and Water Corporation considered that the model did not adequately reflect the possible range of inflows (the model assumed a uniform inflow sequence);
- The Department of Treasury and Finance considered that the model did not adequately provide for the retention of sufficient water in the dams to smooth the price of water in the event of substantial fluctuations in inflows; and
- The Water Corporation considered that the demand function underlying the model was not appropriate as it capped the price at $2 per kL.

The model has been modified to address these concerns. The first concern, that the model does not adequately reflect the possible range of inflows, has been addressed by running the model over 200 simulated inflow sequences.

The second concern has been addressed by adopting a more conservative security assumption. This has been achieved by retaining sufficient water in the dams to provide for the possibility of a zero inflow event in the following year while still meeting unconstrained demand. In addition it has been assumed that there is a 'saturation' point of demand above which demand cannot increase (defined as 30 per cent above the level

of demand at $3.00 per kL).[86] These modifications have the effect of reducing the amount of price volatility from year to year.

The third concern has been addressed by lifting the cap to $3 per kL.

The criticism that the model does not have a theoretical foundation is unfounded as it is similar in many respects to the way the market for wholesale electricity currently operates (where market participants are constrained to bid in at short run marginal cost).

The submission from the Water Corporation that a short run water model produces prices that fluctuate from year to year does not mean that usage charges need to fluctuate to the same extent from year to year. Indeed, the model is likely to be most useful if it is used to identify the value of water (and hence usage charges) over the course of the regulatory period.

Overall, the Authority agrees that there should be a process to refine the model, ideally in time for the setting of water usage charges in the 2010 Budget. However, the model is useful as one source of information, alongside other information such as the results of the LRMC model, for this inquiry.

[86] In the old version of the model, demand could increase to levels beyond what would be expected to be consumed, with the effect of creating rapidly fluctuating prices when the model was run in simulation model. Capping the difference between minimum and maximum demand at 30 per cent limits the potential for such fluctuations.

22 Appendix F. Rate of Return

Assets are often financed by a combination of debt and equity. Thus, the returns from an asset must compensate both the providers of debt and the equity holders. For this reason, the term "Weighted Average Cost of Capital" (WACC) is often used to refer to the average cost of debt and equity capital, weighted by a proportion of debt and equity to reflect the financing arrangements for the assets, i.e.,

$$WACC = R_e \frac{E}{V} + R_d \frac{D}{V};$$

Where R_e is the return on equity which is usually estimated using the Capital Asset Pricing Model (CAPM), R_d is the cost of debt. E is the share of equity and V is the share of debt such that $V = E + D$.

The WACC is an estimate of the post-tax (cash) return on assets. Calculating the WACC consists of:

- determining the (post tax) Rate of Return on equity R_e;
- determining the Cost of Debt R_d;
- setting the benchmark financing structure (D/V and E/V); and
- other WACC parameters which directly affect the above parameters.

The above WACC formula is widely known as the post-tax (Vanilla) WACC formula because the formula, in its simplest form, requires all potential costs and benefits to be reflected in the cash flows. There are two other WACC formulae which are also used by some regulators: (i) the post-tax (Officer) WACC; and (ii) the post-tax (Monkhouse) WACC.

While all regulators of utility industries in Australia use the CAPM to estimate the cost of capital, there is no clear precedent on the form of the WACC to be used (i.e. pre-tax or post-tax, real or nominal). This issue will be further discussed, together with the Authority's preference to WACC methodology, at the end of this Appendix.

This Appendix sets out the Authority's assessment of each of the WACC parameters in arriving at its recommended rate of return for each service provider.

The Rate of Return on Equity (R_e)

There are several approaches to estimating the expected rate of return on equity, of which the Capital Asset Pricing Model (CAPM) is the most widely used by the finance community, regulated businesses and by regulators of utility industries in Australia.[87]

Under the CAPM model, the total risk of an asset can be divided into systematic and non-systematic risk. Systematic risk is a function of broad macroeconomic factors (such as interest rates) that affect all assets and cannot be eliminated by diversification of the

[87] Other models include Arbitrage Pricing Theory, the Fama-French Model and the Dividend Growth Model.

businesses asset portfolio. In contrast, non-systematic risk relates to the attributes of a particular asset, with this risk managed by portfolio diversification.

The most common formulation of the CAPM estimates directly the required return on the equity share of an asset as a linear function of the risk free rate plus a component to reflect the risk premium that investors would require over the risk free rate:

$$R_e = R_f + \beta_e \left(R_m - R_f \right)$$

where R_e is the required rate of return on equity, R_f is the risk-free rate, β_e is the equity beta and $\left(R_m - R_f \right)$ is the market risk premium.

As a result, to determine the required rate of return on equity, three key parameters that the Authority has to assess for the CAPM model are: (i) the risk free rate R_f, (ii) the market risk premium $\left(R_m - R_f \right)$ and (iii) the equity beta β_e.

Nominal Risk Free Rate

Introduction

The risk free rate is the rate of return an investor receives from holding an asset with guaranteed payments (i.e. no risk of default). The commonwealth government bond is widely used as a proxy for the risk free rate in Australia.[88] CAPM theory does not provide guidance on the appropriate proxy for the risk free rate. In Australia, regulators' current practice is to average the yield on the indexed ten year Commonwealth government bond for a period of 20 trading days as close as feasible before the day the decision is made.

Proposals by Service Providers

For a nominal risk free rate, Water Corporation has proposed:

> Consistent with recent regulatory decisions, a risk-free rate based upon a 20 day rolling average of Federal Government 10 year Nominal Treasury Bonds over a pre-agreed period should be used for estimating the nominal risk free rate. This period should generally coincide with a time period close to the release date of the ERA's final decision. (Water Corporation submission, p.34)

The Authority did not receive any submission from the water boards on this issue.

Assessment

Current practices from economic regulators in Australia have revealed that, in their recent decisions, the implied yields on 10-year nominal government bonds are usually used as a proxy for the risk free rate. The Authority prefers to use a 20-day moving average[89] of

[88] Blanco et al. who use swap rates as superior to Government bonds as a proxy for the risk free rate and explicitly state that "it is well known that government bonds are no longer an ideal proxy for the unobservable risk free rate. See Blanco, Brennan, and Marsh, "An Empirical Analysis of the Dynamic Relation between Investment-Grade Bonds and Credit Default Swaps", *The Journal Of Finance*, Vol. LX, no. 5 October 2005, p2261, for details.

[89] There are three different types of moving averages: (i) Simple Moving Average; (ii) Exponential Moving Average; and (iii) Weighted Moving Average, and they are all calculated slightly differently. However, all have a similar smoothing effect on the data, so that any unexpected changes on rates are removed, and,

observed rates of return on 10-year Commonwealth government bonds as an estimate of the risk free rate. Moving averages are usually used to show the mean rate over a certain number of previous rates. For example, a 20-day simple moving average of the 10-year Commonwealth government bond would show the mean rate from the most recent 20-day trading period.

Some recent decisions using the implied yields on 10-year nominal government bonds can be summarised as follows.

- In the 2005 Inquiry, the Authority used a nominal risk free rate of 5.23 per cent, based on financial information available on 30 September 2005.
- In July 2008, in its final determination for the review of prices for Sydney Water Corporation's water[90], IPART uses the 20 day average yield on the 10 year Commonwealth Government Bond rate index to calculate the appropriate nominal risk free rate. In this decision, nominal risk free rate is set at 6.1 per cent.
- In a recent rail determination, the Authority estimated the nominal risk free rate from implied yields on 10-year nominal government bonds over the 20 trading days to 30 May 2008, which indicated a nominal risk free rate of 6.37 per cent.
- In addition, in a more recent report for the WACC for The Pilbara Infrastructure's Railway[91], the Authority adopted a nominal risk free rate of 4.8 per cent drawn from the calculations of the implied yields on 10-year nominal government bonds over the 20 trading days to 3 December 2008.

This current practice has been challenged by the AER. In December 2008, in its draft decision for electricity, the AER[92] proposed the term of the risk free rate should match with the length of the regulatory period (i.e. 5 years) and an average period of between 10 and 40 business days will be accepted as reasonable.

The rationale for this proposal, including the recent evidence, can be summarised as follows:

- Data from Deloitte provides evidence that, at least in a relative sense, there is not an issue with liquidity in shorter term (e.g. five year) CGS and corporate bond markets. On this basis a potential move to a term matching the length of the regulatory period is not expected to impose additional costs in terms of illiquidity.
- Data from Deloitte indicates a weighted average debt term of 5 years or less for energy network businesses, implying that refinancing takes place every five years or less (on average). Therefore a potential move to a term matching the length of the regulatory period (i.e. five years) is not expected to impose additional rollover risk.
- There is no evidence to suggest an incremental increase in debt transactions costs as a result of a potential move to a risk free rate term which matches the length of the regulatory period, given that the current methodology supports a five-year refinancing assumption.

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as a result, the overall direction is shown more clearly. For simplicity, the Authority adopts the simple moving average in its calculations.

[90] IPART (2008), *Review of Prices for Sydney Water Corporation's Water, Sewerage, Stormwater and Other Services, From 1 July 2008, Water — Determination and Final Report June 2008*.

[91] ERA (December 2008), *Weighted Average Cost of Capital for The Pilbara Infrastructure's Railway from the Cloud Break Iron Ore Mine in the Pilbara Port Hedland. [update]*

[92] AER (December 2008), Draft decision, *Review of the weighted average cost of capital parameters for electricity transmission and distribution network service providers* (p.134).

- Data from Deloitte indicates that there is a positive term premium between 10 and 5 year corporate bonds, indicating a material incremental benefit to consumers as a result of a potential move to a risk free rate term which matches the length of the regulatory period. The quantum of the term premium is estimated to average around 40 bps on the cost of debt.

However, given the current market conditions, in its final decision in May 2009, the AER finally decided to take a cautious approach on the term of risk free rate and, as such, to retain a 10-year term assumption even though there are the strong conceptual arguments, as discussed above, for a term matching the length of the regulatory period (five years) on the equity side. This reflects the AER's concern that refinancing risk not be increased for the energy regulated sector.

Recommendation

The Authority has adopted a nominal risk free rate of **5.52 per cent**, based on a average of 20 trading days for 10 year Commonwealth bonds to 30 June 2009, which is consistent with the approach used in previous decisions by the Authority and other regulators across Australia.

Market Risk Premium

Introduction

The market risk premium (**MRP**) is the average return of the market above the risk free rate. In other words, it is the premium that investors demand for investing in a market portfolio relative to the risk-free rate.

$$MRP = R_m - R_f$$

where R_f is the risk-free rate.

There are several ways to estimate the equity risk premium, though there is no general agreement as to the best approach. The three approaches usually used are as follows.

- The first approach is **the historical equity risk premium approach**, which is a well-established method based on the assumption that the realised equity risk premium observed over a long period of time is a good indicator of the expected equity risk premium. This approach requires compiling historical data to find the average rate of return of a country's market portfolio and the average rate of return for the risk-free rate in that country.
- The second approach for estimating the equity risk premium is the **dividend discount model based approach** or **implied risk premium approach,** which is implemented using the Gordon growth model (also known as the constant-growth dividend discount model). For developed markets, corporate earnings often meet, at least approximately, the model assumption of a long-run trend growth rate. As a result, the expected return on the market is the sum of the dividend yield and the growth rate in dividends. The equity risk premium is therefore the difference between the expected return on the equity market and the risk-free rate.
- The third approach is the direct approach or **survey approach**. A panel of finance experts is asked for their estimates the mean response is taken.

Among these three, regulators in Australia usually use the first approach, historical data on equity premiums, to estimate the MRP.

Proposals by Service Providers

The Authority did not receive any submission from service providers on this issue.

Assessment

Historically, equity premiums in Australia have been around 6 to 7 per cent, although recent evidence suggests that Australian MRPs have been declining over the past fifty years.[93]

Regulated businesses have previously taken the view that the MRP should be determined solely on the basis of observed historical equity premia, which typically indicate values of between 5 and 8 per cent (and favoring values greater than 6 per cent). Selected evidence of the measured historical MRP in Australia is presented in the following table.

[93] The Allen Consulting Group (2005), *Electricity Networks Access Code 2004: Advance Determination of a WACC Methodology*, Report to the Economic Regulation Authority.

Table 22.1 Market Risk Premium in Australia

Source	Period	Risk premium (%)
AGSM:		
Arithmetic average, incl. October 1987	1974-1995	6.2
Arithmetic average, excl. October 1987	1974-1995	8.1
Arithmetic average	1974-1998	4.8
Arithmetic average, incl. October 1987	1974 – Sep 2000	6.2
Arithmetic average, excl. October 1987	1974 – Sep 2000	7.7
Officer (1989) – arithmetic mean	1882-1987	7.9
Officer (1989) updated – arithmetic mean	1882-2001	7.2
Officer:		
Arithmetic mean	1946-1991	6.0 to 6.5
Hathaway (1996)		
Arithmetic mean	1882-1991	7.7
Arithmetic mean	1947-1991	6.6
Gray (2001) (note 1)	1883-2000	7.3
Dimson, Marsh and Staunton (2000)	1900-2000	7.6
Capital Research (2005)	1875-2005	4.5 (adjusted) 6.0 (unadjusted)
South Australia Centre for Economics Studies (2005)	1974-2003	4.5 to 5.0
Allen Consulting Group (2006)	1975-2004	7.70
	1970-2004	4.04
	1960-2004	5.27
	1955-2004	6.43
	1950-2004	6.77
	1930-2007	6.58
	1905-2004	7.15
	1900-2004	7.26
	1885-2004	7.17
Brailsford, Handley & Maheswaran (2007) (Note 5)	1883-2005	6.2
Brailford, Handley & Maheswaran (2007)	1958-2005	6.3
• Imputation credits valued at 100 per cent		
	1883-2005	6.5
• Imputation credits valued at 50 per cent	1958-2005	7.0
	1883-2005	6.3
	1958-2005	6.7

Source: KPMG[94], 2008.

In addition, in regulatory decisions, the Authority and other regulators around Australia have consistently used an estimate of around 6 per cent for the MRP, including the recently released determination for electricity transmission and distribution from the AER.[95,96,97,98] This is confirmed with the previously adopted values for the market risk premium for the utility sector in Australia in recent years.

[94] KPMG (July 2008), *Western Power, Weighted Average Cost of Capital,* a report to Western Power.

[95] IPART (2008), *Review of Prices for Sydney Water Corporation's Water, Sewerage, Stormwater and Other Services, From 1 July 2008, Water — Final Determination and Report June 2008*.

[96] ICRC (December 2007), *Water and Wastewater Price Review, Report and Price Determination*, Report 11 of 2007.

[97] ERA (December 2008), *Weighted Average Cost of Capital for The Pilbara Infrastructure's Railway from the Cloud Break Iron Ore Mine in the Pilbara Port Hedland.*

[98] ESC 2008, 2008 Water Price Review, Regional and Rural Businesses' Water Plans 2008-2013, Melbourne Water's Drainage and Waterways Water Plan 2008-2013 — Final Decision, June.

Table 22.2 Previously Adopted Values of the Market Risk Premium

Service Provider	Source	MRP (%)
Pilbara Infrastructure's Railway	ERA (2008)	6.00
Freight Railway (WestNet Rail)	ERA (2008)	6.00
Urban Railway (Public Transport Authority)	ERA (2008)	6.00
Transmission (all jurisdictions)	NER (2008)	6.00
Distribution (NSW)	NER (2008)	6.00
Distribution (ACT)	NER (2008)	6.00
Distribution (Tasmania)	OTTER (2007)	6.00
Distribution (Victoria)	ESC (2006)	6.00
Distribution (Queensland)	QCA (2005)	6.00
Distribution (South Australia)	ESCOSA (2005)	6.00
		6.00

Source: Economic Regulation Authority and Australian Energy Regulator, May 2009.

Some industry groups have argued that the MRP should be increased from 6 per cent to 7 per cent.[99] However, in its determination of WACC parameters for electricity, the AER proposed an MRP of 6 per cent, the same as previous decisions from regulators around Australia. This proposal was based on the following grounds:

- Brailsford *et al*[100] identify an estimate over the 1883-onwards and 1937-onwards periods which are more likely to overstate, rather than understate, a forward-looking MRP;
- the use of historical equity returns will bias upwards the return on the CAPM market portfolio because the market portfolio includes all assets in the economy and it is not only limited to equities. As a consequence, the estimates for any period are more likely to overstate, rather than understate, a forward-looking MRP; and
- these above-mentioned estimates of a forward-looking MRP include several significant and positive one-off or unexpected events that are unlikely to be repeated. This means historical estimates over the periods considered are more likely to overstate, rather than understate, a forward-looking MRP.

In addition, the AER's proposal is supported by the following evidence:

- 6 per cent is the most commonly adopted value of an MRP from the market practitioners, using the survey approach; and
- an MRP of around or below 6 per cent is generally supported, using cash flow measures.

It is noted that a MRP of 6 percent was first adopted in Australia by the ACCC[101] and the Victorian Office of the Regulator General.[102] A MRP range of 4.5-7.5 per cent was

[99] JIA, Network Industry Submission – AER Issues Paper – Review of the weighted average cost of capital (WACC) parameters for electricity transmission and distribution, Submission in response, September 2008, p.94.

[100] T. Brailsford, J.C.Handley, and K.Maheswaran, 'Re-examination of this historical equity risk premium in Australia', Accounting and Finance, Vol.48, 2008, p.92

[101] ACCC, *Access arrangement by Transmission Pipelines Australia Pty Ltd and Transmission Pipelines Australia (Assets) Pty Ltd for the Principal Transmission System – Access arrangement by Transmission Pipelines Australia Pty Ltd and Transmission Pipelines Australia (Assets) Pty Ltd for the Western*

derived on the ground of consultant work prepared by Professor Davies, where the upper bound of this range was based on historical estimates and the lower bound was based on cash flow measures. As such, the mid-point of that range (6 per cent) was adopted.

The AER commissioned Professor Handley at the University of Melbourne to update historical excess returns using full year data for 2008. Estimates should cover the 1883-2008, 1937-2008, 1958-2008, 1980-2008 and 1988-2008 periods, be relative to 10-year Commonwealth Government Securities, be grossed-up for a theta of 0, 0.28, 0.5, 0.65 and 1.0 and to include standard errors and 95% confidence intervals. The results are presented in Table 22.3 below.

Table 22.3 Historical Excess Returns (Arithmetic Average, Relative to 10 Year Bonds, 'Grossed-up' for Value of Imputation Credits Distributed, per cent)

Utilisation rate	0.00	0.28	0.5	0.65	1.00
1883-2008	5.9*	6.0*	6.1*	6.1*	6.2*
1937-2008	5.4*	5.5*	5.6*	5.7*	5.9*
1958-2008	5.7	5.9	6.1	6.2*	6.4*
1980-2008	5.0	5.3	5.6	5.8	6.3
1988-2008	3.8	4.3	4.7	5.0	5.6

*Source: Handley[103]. *Indicates estimates are statistically significant at the five per cent level based on a two-tailed t-test.*

The above estimates reveal that the most recent long term historical average excess returns estimated over a range of long term estimation periods (1883-2008, 1937-2008, 1958-2008), once 'grossed-up' for a utilisation rate of 0.65 and estimated relative to the yield on 10-year Commonwealth Government Securities, is close to 6 per cent. More accurately, a range of historical excess returns is between 5.7 and 6.2 per cent. However, the AER noted that: "if the estimation periods had instead concluded at the end of 2007, would have been between 6.6 and 7.2 per cent" (AER, 2009, p.236).[104]

An estimate of MRP of 6 per cent, from the AER's view, was the best estimate of a forward-looking long term value for MRP prior to the onset of the global financial crisis under relatively stable market conditions with the assumption that there is no structural break which has occurred in the market. However, given the current state of the international financial market, the AER believes that a MRP of 6.5 per cent is reasonable.

Recommendation

The Authority considers that there is no clear justification for increasing or decreasing the MRP in the current economic climate.

The Authority confirms its position that consistent with regulatory precedent, the MRP should be determined taking into account a range of sources of information (including

Transmission System – Access arrangement by Victorian Energy Networks Corporation for the Principal Transmission System, Final decision, 6 October 1998.

102 ORG, *Access arrangements – Multinet Energy Pty Ltd and Multinet (Assets) Pty Ltd – Westar (Gas) Pty Ltd and Westar (Assets) Pty Ltd – Stratus (Gas) Pty Ltd and Stratus Networks (Assets) Pty Ltd* , Final decision, October 1998.

103 J. C. Handley, *Further comments on the historical market risk premium*, Report prepared for the AER, 14 April 2009, pp.6-9.

104 AER (May 2009), Final decision, *Review of the weighted average cost of capital parameters for electricity transmission and distribution network service providers*.

evidence on historically realised equity premia and current practice and expectations of market participants) and that on this basis, a MRP of **6.00** per cent is appropriate.

Equity Beta

Introduction

The systematic risk (beta) of a firm is the measure of how the changes in the returns to the firm's stock are related to the changes in returns to the market as a whole. Systematic risks are those risks that cannot be costlessly eliminated through portfolio diversification, such as unexpected changes in real aggregate income, inflation and long-term real interest rates.

The most common formulation of the CAPM estimates directly the required return on the equity share of an asset as a linear function of the risk free rate plus a component to reflect the risk premium that investors would require over the risk free rate:

$$R_e = R_f + \beta_e \left(R_m - R_f\right)$$

where R_e is the required rate of return on equity, R_f is the risk-free rate, β_e is the equity beta that describes how a particular portfolio i will follow the market and is defined as $\beta_e = \text{cov}\left(r_i, r_M\right) / \text{var}\left(r_M\right)$; and $\left(R_m - R_f\right)$ is the market risk premium.

The above equation reveals that the equity beta of a particular asset will scale the MRP up (when its value is greater than one) or down (when its value is lower than one) to reflect the risk premium, which is over and above the risk-free rate, that equity holders would require to hold that particular risky asset in the investor's well-diversified portfolio.

Proposals by service providers

The Water Corporation proposed a range of the values of equity beta, from 0.65 (low end) to 0.90 (high end) and argued that the equity beta for Water Corporation should not be lower than eastern state utilities which have adopted the equity betas in the range of 0.65-1.00, assuming a 60/40 gearing (debt/equity). The Corporation also argued that the uncertainty of the price paths leads to the view that equity beta for the Corporation should be set at a high end of the range.

> Technically speaking, the uncertainty of price paths does not affect systematic risk, yet it does impact significantly upon Corporation-specific risk. Under the current regulatory arrangements in West Australia, the ERA provides pricing recommendations only. Any debate concerning the systematic risk profile of the Corporation needs to be considered in the current context of the inherent uncertainty with prices are only linked to costs subject to annual reviews. (Water Corporation submission, p.35)

The Authority did not receive any submission from the Water Boards on this issue.

Assessment

Since most regulated industries are not listed on the stock exchange, regulators commonly use proxy equity betas, based on beta values for other listed entities that have similar assets and face similar systematic risks. The most relevant comparators for deriving a proxy equity beta value for the Water Corporation and the water boards are:

- other regulated water and sewerage service providers in Australia; and

- other regulated utilities in Australia (such as gas and electricity distribution).

The approach adopted to tariff calculation also affects the equity beta. As discussed earlier, the approach adopted by the Authority insulates the water businesses from any demand side risk. Therefore, the systematic risk of the business is reduced, which in turn reduces the equity beta.

Equity beta for utilities has been generally set within the band of 0.9-1.0, as shown Table 22.4 in below. These estimates are based on the assumption of 60/40 gearing, which is widely adopted among regulators in Australia.

Table 22.4 Previously Adopted Values of Equity Beta

Service provider	Source	Equity beta
Transmission (all jurisdictions)	NER	1.00
Distribution (NSW)	NER	1.00
Distribution (ACT)	NER	1.00
Distribution (Tasmania)	OTTER (2007)	0.90
Distribution (Victoria)	ESC (2006)	1.00
Distribution (Queensland)	QCA (2005)	0.90
Distribution (South Australia)	ESCOSA (2005)	0.90
		0.90 or 1.00

Source: AER, December 2008

However, in a recently released report by the AER in May 2009, equity beta was set at 0.8 for electricity (both transmission and distribution). By adopting the equity beta of 0.8, the AER's view is that, for the efficient service providers for electricity (including both transmission and distribution), it is expected that these firms experience a lower degree of systematic components of both business and financial risk in comparison with those of the market.[105]

> … regulated utilities face a lower degree non-diversifiable business risk, compared to the market, primarily driven by the stable cash flows of regulated utilities. This in turn is driven by both the nature of the industry, such as the relatively high demand elasticity of electricity to price, and by the protection of the regulatory regime.

The empirical evidence suggests that the equity beta of a benchmark efficient service provider is in the range of 0.44 (average portfolio estimated by the AER for Australian businesses after the 'technology bubble') to 0.68 (average portfolio estimated by the Allen Consulting Group for the Joint Industry Associations using a 5-year estimation period), taking into account the likely precision of these estimates, the AER has adopted an equity beta of 0.8 in its final decision in May 2009.

In the 2005 Urban Water Inquiry, the Authority assumed an equity beta of 0.8 for the Water Corporation based on a gearing of 60/40 (debt/equity); and 0.6 for the water boards with the assumption of a lower gearing of 40/60.

[105] AER (December 2008), decision, *Review of the weighted average cost of capital parameters for electricity transmission and distribution network service providers*.

- Recent decisions by regulators of water utilities incorporated equity beta assumptions of 0.8-1.0 (IPART for Sydney Water), 0.65 (ESC for regional and rural water service providers), and 0.9 (ICRC for ACTEW).
- In addition, in its recent decision for Metropolitan Melbourne Water Price Review, the ESC adopted the equity beta of 0.65, compared with 0.75 in the first regulatory period. This is derived from the analysis from the Gas Access Arrangement Review (GAAR) in 2007 in Victoria, that demonstrated that the appropriate equity beta for gas distribution businesses was 0.70. Also, an equity beta of 0.65 is the midpoint of the feasible range for gas distribution businesses of 0.5 to 0.8 identified by the Allen Consulting Group during the GAAR.

The Authority is not convinced by Water Corporation's view that equity beta should be set at a high end of the range because "the uncertainty of price paths does not affect systematic risk, yet it does impact significantly upon Corporation-specific risk". From finance literature, equity beta should only compensate service providers for their exposure to systematic components of business and financial risks, and not for a firm-*specific* risk.

The generally accepted view that the level of non-diversifiable risk experienced by the water businesses is lower than that for energy businesses. In addition, the water industry in Western Australia may be even less risky than those in the eastern states, due to the smaller number of competitors, lack of exposure of the service providers to demand risk, and the availability of groundwater resources.

Recommendation

The Authority proposes to adopt an equity beta of **0.65** for Water Corporation and for Aqwest and Busselton Water.

The equity beta has been reduced from the 0.8 used in the 2005 inquiry, for the reason that the Authority has reconsidered the relative competitiveness of the water services industry in comparison to the electricity and gas industries, and has concluded that the water industry is significantly less competitive. Recent decisions by other regulators indicate that the equity beta for the electricity industry ranges from 0.8 to 1.0 and for the gas industry ranges from 0.8 to 1.33. In addition, the proposed equity betas for the Water Corporation, Aqwest and Busselton Water are consistent with a decision by the ESC in June 2008 on Victorian non-metropolitan water prices, and its draft decision for metropolitan Melbourne water price review in April 2009.

The Cost of Debt (R_d)

Introduction

The cost of debt is the cost of debt financing to a company when it issues a bond and/or takes out a bank loan. In theory, each of the following three options can be used to estimate the cost of debt:

g) the estimate of a weighted average of the existing cost of debt of the regulated business;

h) the marginal rate at which a "comparable" company can raise debt to finance the economic activities; and

i) a margin over and above the risk free rate for the regulated business.

Current practices from regulators around Australia reveal that the cost of debt is commonly presented as a margin over the nominal risk free rate. As a result, the cost of debt can be seen to comprise two components:

- an **interest rate premium** (or debt risk premium) over the risk free rate; and
- an allowance for **debt issuing costs**, which are the transaction costs incurred in arranging the debt facilities, including gross underwriting and credit rating fees.

These are discussed in turn.

Interest Rate Premium

The first component of the cost of debt, an interest rate premium, is ideally obtained from observing the actual market transactions on bonds for businesses in utility sector. However, due to the nature of the utility sector, which is relatively small, yields on corporate bonds traded in Australia are good source of information instead.

The determination of a debt premium, defined as the difference between the Australian benchmark corporate bond and the risk free rate, for regulated businesses requires two components:

a) the credit rating of these businesses; and

b) selection of observations on yields for corporate entities, which are provided by CBA Spectrum and Bloomberg or some others, that are comparable with regulated firms in terms of activities and level of credit rating. In practice, data from Bloomberg are used, as access into CBA Spectrum is currently denied to economic regulators in Australia.[106]

As such, credit rating is an important input into deriving the debt risk premium. As a general rule, the cost of debt is higher when the credit rating of the borrowers is lower, as investors (in this case, the lenders) require a higher rate of return for borrowers with a higher risk of default, and vice versa.

Debt Issuing Cost

Some fees should be included in the benchmark of transaction costs for a stable utility business, such as fees for gross underwriting or loan arrangement, legal fees, road show fees and credit rating fees.

It is noted that regulators around Australia have generally estimated a benchmark margin on the basis of the weighted average cost of debt for a typical debt portfolio, rather than an actual cost of debt of a regulated utility. In doing so, it is argued that there is a better incentive for regulated businesses to minimise inefficient debt financing.

Proposals by Service Providers

The Water Corporation proposed that the debt risk premium should be calculated, as previously, on the spread between BBB/BBB+ 10-year corporate bonds and riskless debt securities, as determined independently by market data on Bloomberg or CBA Spectrum. The Corporation also noted that this premium reached a high in April 2008 and started

[106] The CBA Spectrum has recently decided not to accept new subscriptions or renew current licences from the regulators in Australia.

retracting slightly over recent months and also agreed that the accurate value for the debt risk premium is dependant on market conditions at the time of the final decision.

The Authority did not receive any submission from the Water Boards on this issue.

Assessment

In the 2005 Urban Water Inquiry, the Authority assumed a total debt margin of 112.5 basis points. Given the current state of global credit markets and potential effects on the cost of corporate debt, debt margins are expected to be greater than in 2005. However, in its determination for electricity, the AER[107] argued that the current financial crisis will not adversely affect regulated businesses at a high level.

> Overall, while it is clear that the current conditions in financial (particularly debt) markets are far from favourable, market-based evidence from a number of sources strongly suggests that, rather than creating risks, the regulatory regime insulates energy network businesses from market volatility.

In recent decisions by various regulators for the utility sectors, credit ratings have been assumed as shown in Table 22.5. Credit ratings for the water and utility sectors have been mainly assumed at BBB+, with the only exception of A- in a recently released report from the AER.

[107] AER (December 2008), decision, *Review of the weighted average cost of capital parameters for electricity transmission and distribution network service providers* (p.33).

Table 22.5 Debt Rating for Utility Companies in Australia

Company	Date	Regulator	Assumed credit rating
Electricity transmission and distribution (Final determination)	December 2008	AER	BBB+
Metropolitan Melbourne Water Price Review (Issue paper)	December 2008	ESC	BBB+
Sydney Water Corporation	July 2008	IPART	BBB to BBB+
2008 Water Price Review	June 2008	ESC	BBB+
ACTEW	April 2008	ICRC	BBB
GasNet	April 2008	AER	BBB+
Victorian Gas Distribution	March 2008	ESC	BBB+
Victorian Electricity Transmission	January 2008	AER	BBB+
Western Power Electricity T & D	March 2007	ERA	BBB to BBB+
Powerlink	March 2007	AER	BBB+
SA Gas Distribution	October 2006	ESCOSA	BBB
Queensland Gas Distribution	May 2006	QCA	BBB+
Country Energy Gas Distribution	January 2006	IPART	BBB
Victorian Electricity Distribution	October 2005	ESC	BBB+
Alinta Gas Distribution	June 2005	ERA	BBB+
ETSA Utilities	June 2005	ESCOSA	BBB+
AGL Gas Networks	April 2005	IPART	BBB to BBB+
Queensland Electricity Distribution	April 2005	QCA	BBB+
NSW Electricity Distribution	June 2004	IPART	BBB to BBB+

Source: An update from the ERA and KPMG, 2008.

It is noted that, in its determination of WACC for electricity, the AER considered that the median credit rating and the "best comparators" approaches are the most appropriate to determine the credit rating of the benchmark efficient service provider. Using the data from the Standard and Poor's industry report cards for the period from 2002 to 2008, some sub-periods were considered for the consistency of the results: (i) 2002-2008; (ii) 2002-2007; (iii) 2002-2006; (iv) 2003-2007; and (iv) 2004-2008 for different types of ownership: (i) energy networks; (ii) government energy networks; (iii) private energy networks; (iv) private gas networks; and (v) private electricity network. For all sub-periods, the credit rating, using the median credit rating approach, for private electricity network and energy network is consistently rated at A-. In addition, the AER's analysis also reveals that: (i) gas networks had a median credit rating of BBB; (ii) private energy networks had a median credit rating of BBB+' (iii) government networks had a median credit rating of AA, and (iv) energy networks had a median credit rating of A-.

In a recent rail determination, which was based on recent capital market evidence on debt margins, the Authority applied debt margins of 302 basis points for the (assumed BBB+ rated) freight network and 251 basis points for the (assumed A rated) urban network.[108] In addition, the Authority provided for debt raising costs of 12.5 basis points.

[108] ERA (December 2008), *Weighted Average Cost of Capital for The Pilbara Infrastructure's Railway from the Cloud Break Iron Ore Mine in the Pilbara Port Hedland.*

In light of the preferred approach adopted by the AER, the Authority proposes using an "enhanced best comparator" approach to determine credit rating for Water Corporation and water boards. This approach can be summarised as follows:

- First, the two most relevant financial indicators are derived:[109]
  - FFO/Interest Cover;
  - FFO/Total Debt; and two other optional financial indicators
  - Total Debt/ Total Debt + Equity; and
  - Total Debt/EBITDA.
- Second, credit rating standards developed by Standard and Poor's are used to determine the credit rating for the regulated business.
- Third, as the cross check, credit ratings are compared with the credit ratings for similar companies in the same industry in private sector. For water businesses, as there are no listed private water companies in Australia, overseas companies are used.
- Fourth, recent determinations by economic regulators across Australia are considered.

The selected financial indicators for Water Corporation are summarised as below.

Table 22.6 Debt Rating for Utility Companies in Australia

Water Companies in Australia	FFO/Interest Expense	FFO/Total Debt	Total Debt / (Total Debt + Equity)
Water Corporation	8.59	36.0%	20.09%
Melbourne Water	1.289	9.5%	45.05%
South Australia Water	1.53	24.6%	19.69%
Yarra Valley Water	1.925	5.0%	60.84%
City West Water	1.976	12.7%	45.47%
Sydney Water	2.395	8.7%	35.80%
Hunter Water	2.273	16.5%	22.9%
South East Water	3.957	14.7%	40.25%

Source: ERA analysis.

[109] FFO is Funds From Operation; EBITDA is Earnings Before Interest, Tax, Depreciation and Amortisation.

Table 22.7 Business Risk/Financial Risk

Financial Risk Profile					
Business Risk Profile	**Minimal**	**Modest**	**Intermediate**	**Aggressive**	**Highly Leveraged**
Excellent	AAA	AA	A	BBB	BB
Strong	AA	A	A-	BBB-	BB-
Satisfactory	A	BBB+	BBB	BB+	B+
Weak	BBB	BBB-	BB+	BB-	B
Vulnerable	BB	B+	B+	B	B-
Financial Risk Indicative Ratios*	**Minimal**	**Modest**	**Intermediate**	**Aggressive**	**Highly Leveraged**
Cash flow (Funds from operations/ debt)(%)	Over 60	45-60	30-45	15-30	Below 15
Debt leverage (Total debt/Capital) (%)	Below 25	25-35	35-45	45-55	Over 55
Debt/EBITDA (x)	<1.4	1.4-2.0	2.0-3.0	3.0-4.5	>4.5

* Fully adjusted historically demonstrated and expected to continue consistently.

Source: Standard & Poor's, Corporate Ratings Criteria 2008, p22.

The above financial indicators reveal that a credit rating in the range of A to AA would be applicable to the Water Corporation.

In addition, there are only 11 water companies listed on the London Stock Exchange and New York Stock Exchange. However, among these 11 firms, only 4 companies have a credit rating from Bloomberg. Two companies are rated at A-; one firm with BBB+ and one at BBB-.

Table 22.8 Credit Ratings of Some Listed Water Companies

Company Name	Moody's	Standard and Poor's
American States Water Co.	N.A.	
American Water Works Company, Inc.	Baa2	BBB
Aqua America, Inc.	N.A.	
California Water Service Group	N.A.	
SJW Corp.	N.A.	
Centrica Plc	A3	A-
National Grid Plc	Baa1	BBB+
Northumbrian Water Group Plc	N.A.	
Pennon Group Plc	N.A.	
Severn Trent Plc	A3	A-
United Utilities Group PLC	N.A.	

Source: Data from Bloomberg.

In conclusion, as previously discussed, it is widely accepted that the water industry is less risky than the broader utility sector. The Authority's analysis, together with the analysis from the AER in its recently released report in May 2009, leads to the view that it is inappropriate to assume a credit rating BBB+ for the water industry in Western Australia. As a result, the Authority proposes that the credit rating for the Water Corporation should be at A-, upgraded from the BBB+ credit rating used in its previous decision in 2005.

Given the small scale of the water boards, the Authority proposes to remain unchanged the credit rating of BBB+ as in the inquiry in 2005.

Recommendation

The Authority recommends a debt margin, above the risk free rate, of **2.725 per cent** for the Water Corporation, which comprises in interest rate premium of 260.0 basis points and debt issuing cost of 12.5 basis points. This debt margin corresponds to a credit rating of A-.

For Aqwest and Busselton Water, the Authority recommends a debt margin, above the risk free rate, of **2.925 per cent**, which comprises an interest rate premium of 280.0 basis points and debt issuing costs of 12.5 basis points. The debt margin corresponds to a credit rating of BBB+. The lower credit rating for the Water Boards in comparison to the Water Corporation reflects the higher business risk associated with the smaller size of the organisations.

Benchmark Financing Structure: Debt versus Equity

Introduction

Gearing is the relative proportion of debt to total capital value, and is used to weight the cost of debt and equity when calculating WACC. The relative proportions of debt, equity, and other securities that a firm has outstanding constitute its capital structure. The capital

structure choices across industries are different. The same conclusion can be reached for the capital structure for companies within industries. For regulated industries, the benchmark capital structure is considered to be the gearing level of a benchmark efficient utility business.

Proposals by Service Providers

The Authority did not receive any submission from the service providers on this issue.

Assessment

Australian utility regulators have conventionally assumed a benchmark debt-to-asset (*D/V*) ratio of 60 per cent, with an equity-to-asset (*E/V*) ratio of 40 per cent.

Table 22.9 below presents the value for level of gearing previously adopted by regulators around Australia. It is clear that, from the information provided in the table, the widely adopted level of gearing is 60/40 for debt/equity.

Table 22.9 Previously Adopted Values for Level of Gearing

Service Provider	Source	Level of Gearing (Debt-to-Asset Ratio)
Transmission (all jurisdictions)	NER	0.6
Distribution (NSW)	NER	0.6
Distribution (ACT)	NER	0.6
Distribution (Tasmania)	OTTER (2007)	0.6
Distribution (Victoria)	ESC (2006)	0.6
Distribution (Queensland)	QCA (2005)	0.6
Distribution (South Australia)	ESCOSA (2005)	0.6
Average		**0.6**

Source: AER (May 2009)

The benchmark gearing ratio is considered to be the capital structure of a benchmark efficient utility business. The Authority assumes the regulated business tend towards the benchmark gearing level in long-run. As the optimal level of gearing is not directly observable, the 60/40 gearing level is derived from the average of actual gearing level from a group of comparable firms[110]. The actual proportion of debt and equity for each business is dynamic and depended on a number of business specific factors.

In the 2005 Inquiry, the Authority also used a benchmark gearing ratio of 60 per cent for the Water Corporation. This is the same ratio applied by the Authority in assessing rates of return for gas pipelines, electricity networks and rail and is in line with current regulatory practice in Australia.

The water boards are small water service providers in comparison to the Water Corporation. Given that smaller firms face higher debt cost, higher bankruptcy risk, limited access to different source of finance and a size effect on credit rating, the Authority consider such firms require lower gearing ratio in order to maintain access to the capital

[110] AER (2009), Final Decision - Review of Weighted Average Cost of Capital Parameters

markets. Therefore, the Authority assumes a gearing ratio of 40 per cent, to reflect the consideration of small business size of Water Board.

Recommendation

The Authority proposes to adopt the gearing of **60 per cent** (i.e. 60/40 for debt/equity) for the purpose of calculating the rate of return on capital to apply for Water Corporation, and **40 per cent** (40/60 for debt/equity) for Aqwest and Busselton Water Boards.

Other CAPM Parameters

The CAPM and WACC provide estimates of post-tax returns to investors. However, the revenue benchmarks used to determine regulatory price controls are based on pre-tax revenue streams. This means that regulators need to make assumptions about regulated companies' tax liabilities and adjust either the WACC or the pre-tax cash flow streams. "Pre-tax" approaches transform the post-tax WACC into a pre-tax WACC by making an assumption about the effective tax rate for the regulated entity. "Post-tax" approaches involve modelling the taxation liabilities and calculating a tax allowance to be added to the cash flows of the regulated entities. For each approach, there is a corresponding cash flow definition.

Together with the above-mentioned CAPM parameters, the Authority has also to determine three others which are: (i) inflation rate; (ii) corporate tax rate; and (iii) the value of imputation credit.

Inflation Rate

Introduction

As the Authority has adopted a pre-tax real WACC formula to estimate the cost of capital for water providers, it is crucial to obtain one of its key parameters, the real risk free rate. In principal, the real risk free rate could be estimated using inflation indexed Treasury bonds. However, as the market for indexed securities is not as deep as that for the nominal form, the general practice among Australian regulators is to calculate the real risk free rate from the nominal risk free rate and the inflation rate, by using the Fisher equitation.

The methods of estimating inflation expectation can be categorised into market-based and non-market-based approaches.

- Market-based approaches estimate inflation expectation through current available market data, such as the difference between the yields of nominal and indexed Commonwealth Government Securities (CGS), or the price of inflation indexed swaps.
- Non-market-based approaches mainly refer to the combined consideration of the Reserve Bank of Australia's forecast inflation rate and its target inflation rate.

The Authority agrees with the AER's recent final decision on the determination of WACC parameters, that regulators should only use a market-based approach, rather than a non-market-based approach if the market-based data is reliable.[111]

[111] AER, May 2009 – " Final Decision Review of the Weighted Average Cost of Capital (WACC) Parameters"

Proposals by Service Providers

Water Corporation has proposed in their submission that, regarding the nominal risk free rate previously discussed, the real risk free rate should be calculated using (i) the Fisher's equation on the relationship between nominal and real interest rates; and (ii) expected inflation rate. It also proposed to use the mid-point of the Reserve Bank's inflation target as the expected inflation rate for the calculation.

The Authority did not receive any submission from the water boards on this issue.

Assessment

The Authority has considered the methodologies adopted by other regulators, which are summarised in the following table.

Type of adjustment	Methodology	Representative Regulators
Non-market based	Economic forecast of inflation: • The RBA publishes its inflation expectations on a quarterly basis in its statement on monetary policy. The longest forecast that can be obtained from the RBA is two and half years. Anything beyond this is likely to be based on the mid-point of the target inflation range of the RBA.	**AER** applies a methodology to determine forecast inflation rate over a 10–year period using the RBA's inflation forecasts for the first two years and the mid–point of the RBA's target inflation range (i.e. 2.5%) for the remaining eight years.
Market based	Using financial market data that reflect the real cost of fund or the cost of inflation hedged • difference between yields of nominal and real (i.e. inflation indexed)10 years Commonwealth Government Securities(CGS). the average is calculated using 20 trading days data for perspective security. • calculated forward yield of 10-year zero coupon inflation swaps, using 20 trading days data	**IPART** had been using the difference between the yields of 10-year nominal and real CGS to obtain the expected inflation. In 2008 final decision for Sydney Water price review, IPART has upward adjusted the yield on indexed CGS by 20 bps to offset the effect of the scarcity of these securities on their yield. In May 2009, IPART made final decision of using swap market data to adjust expected inflation to deriving the cost of capital.

Source: ERA

Market-based approach

The Authority conducted an exercise to assess the reliability of the 10-year Treasury Bond market and the 10-year Australian Zero Coupon Inflation Swap market data in estimating inflation expectation for this inquiry. The calculated results are summarised in the table below:

Table 22.10 Comparison of Inflation Estimates Based on Treasury Bonds and Swap Market Data

	2009 (01/05/09 – 28/05/09)	2008 (05/05/08 – 02/06/09)
10-year Treasury Bond market	2.04%	3.90%
Treasury Bond (after 20 bps adjustment)	1.84%	3.70%
10-year Inflation swap market	1.96% (8 bps lower)	3.997%* (10 bps higher)

***Slightly downward biased due to absence of trading for 6,8,9-year inflation swaps

Source: ERA

To derive expected inflation from bond and swap markets, the Authority used the methodologies proposed by IPART.[112] The bond market data is obtained from the Reserve Bank of Australia and the swap market data is obtained from Bloomberg database, for 20-day trading period in 2008 and 2009 respectively.

In June 2009, the inflation rate estimated from inflation swap market is 8 bps lower than which estimated from the treasury bond market. However, in 2008, the inflation estimated from swap market is 10 bps above the unadjusted Treasury bond market. If the swap market represents an unbiased source of data, the 20 bps downward adjustment on the bond market result would indicate an excessive adjustment. It also indicates that the results generated from both the bond and swap markets are not consistent.

The Authority has concluded that a market-based approach should be avoided, for the following reasons:

- As noted by various regulators, the shrinking of supply and liquidity in current real Treasury bond market has potentially driven down the indexed bond price, which has caused an upward bias in real yield. Hence, the inflation calculated by bond market data using the Fisher equation would produce a downward-biased result. Therefore, the bond market is not a reliable source of data for estimating inflation expectation.
- Although IPART has been using a 20 bps upward adjustment on the 10-year indexed Commonwealth Government Securities yield, the size of the adjustment is not reliable, due to a lack of objective justification and the observed bias from the swap market result.
- The inconsistency between bond and swap market results has raised concerns on the efficiency of the swap market in terms of price discovery. The inconsistency implies that market factors or barriers may have inhibited investors from arbitraging or hedging fully between inflation swap and index-linked bond markets (for example, due to an incomplete market, a lack of available assets and instruments for transaction, or a lack of market activity).[113]
- Furthermore, the Australian zero coupon inflation swap market is still very young. The 10 bps bid/offer implies that the demand for receiving floating inflation payments is much higher than the supply of such a product. The Euro area, which is currently the most liquid, active and transparent inflation swap market, has a

[112] IPART, May 2009 – "Discussion paper Adjusting for expected inflation in deriving the cost of capital"

[113] Bank of England, Spring 2006, New information from inflation swap and index-linked bonds

bid/offer spread of only 2-3 bps.[114] Therefore, the Authority considers that inflation swap data is not reliable in producing an unbiased inflation estimation.

Non-market based approach

Given the currently available market data can not be considered to be sufficiently reliable, the Authority has decided to use the non-market approach in this inquiry.

The Authority considered the methodology adopted by AER in its most recent final decision on Australian Capital Territory electricity distribution determination, which is:

> "…to determine a forecast inflation rate over a 10–year period using the RBA's inflation forecasts for the first two years and the mid–point of the RBA's target inflation range for the remaining eight years."[115]

The Authority agrees with AER that the combined consideration of Reserve Bank's short-medium term inflation forecast and the long term target inflation is more appropriate than simply adopting the long-term target rate. For accuracy, the geometric mean will be used in the averaging calculation.

The reason for deriving 10-year expected inflation is to be consistent with the estimation of the nominal risk free rate (i.e. by using 10-year nominal Treasury bond yield). Both parameters are used to derive the real risk free rate using the Fisher Equation.

Due to the current global financial crisis, the Reserve Bank's revised forecasts for the Australian economy show a fall in GDP in the first half of this year, and a recovery beginning in late 2009. With output expected to remain below trend for an extended period, the inflation forecast has been revised down.[116] Based on the Statement of Monetary Policy of May 2009, the Reserve Bank's forecast of implied inflation gradually falls from 2.5% in June 2010 to 1.5% in June 2011 and will maintain at 1.5% till the end of 2011.

> "Relative to the February Statement, the inflation forecasts incorporate a weaker outlook for global and domestic growth, a higher exchange rate and higher oil prices. The net effect has been a downward revision to the inflation forecasts."[117]

The Authority's methodology is based on the geometric mean calculated over 10 years expected inflation data, using the RBA's inflation forecasts for the first two years (June 2010- June 2011) and the mid–point of the RBA's target inflation range (i.e. 2.5%) for the remaining eight years (2012-2019).The following table shows the inflation forecast data used for the calculation.

Table 22.11 Inflation Data Used in the Calculation (2010-2019)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Inflation Data	2.5%	1.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%

Source: Reserve Bank of Australia

The geometric mean calculated from the above data set is 2.38%.

[114] Lehman Brothers, July 2005, Inflation Derivatives Explained

[115] AER, April 2009, Final Decision Australian Capital Territory distribution determination 2009/10 to 2013/14

[116] RBA, May 2009, Statement of Monetary Policy

[117] Ibid.

Recommendation

The Authority proposes to adopt the inflation rate of **2.38 per cent** for adjusting the return on capital for this inquiry. This is based on a geometric mean calculated over 10 years expected inflation data, using the RBA's inflation forecasts for the first two years and the mid–point of the RBA's target inflation range (i.e. 2.5%) for the remaining eight years. The Authority has concluded from its analysis of alternative approaches to inflation estimation that this approach, which is also used by the AER, is likely to produce a more reliable estimate of inflation than non-market based approaches.

Corporate Tax Rate

Introduction

The corporate tax rate plays an important role in the connection between the pre-tax WACC and the post-tax WACC.

Proposals by Service Providers

The Authority did not receive any submission from service providers on this issue.

Assessment

There has been some debate amongst regulators as to whether WACC determinations should use the statutory corporate tax rate (30 per cent), or effective tax rates.[118] Many companies have effective tax rates that are well below the statutory rate and there is a risk that using the statutory tax rate will overestimate the returns required by companies to meet tax obligations. However, verifying an individual company's effective tax rate would require modelling of taxation cash flows. The benefit of using the statutory rate as a benchmark assumption is that it is simple to apply.

The Authority has in previous WACC determinations assumed the effective taxation rate of the utility businesses to be equal to the statutory rate of corporate income tax.

Recommendation

The Authority proposes to adopt the statutory rate of corporate income tax of **30 per cent** for the purpose of calculating the rate of return on capital to apply for Water Corporation, Bunbury and Busselton Water Boards.

Value of Imputation Credits

Introduction

A full imputation tax system for companies has been adopted in Australia since 1 July, 1987. While Australia and New Zealand have *full* imputation tax systems (which are discussed below) many other countries have a *partial* imputation system, where only partial credit is given for the company tax.

Under the tax system of dividend imputation, a franking credit is received by Australian resident shareholders, when determining their personal income taxation liabilities, for corporate taxation paid at the company level. In a dividend imputation tax system, the

[118] See IPART (2002), *Weighted Average Cost of Capital: Discussion Paper*.

proportion of company tax that can be fully rebated (credited) against personal tax liabilities is best viewed as personal income tax collected at the company level. With the full imputation tax system in Australia, the company tax (corporate income tax) is effectively eliminated if all the franking values are used as credits against personal income tax liabilities.

It is widely accepted that the approach adopted by regulators across Australia to define the value of imputation credits, known as "Gamma", is in accordance with the Monkhouse definition.[119] There are two components of Gamma:

- the distribution rate (F): the rate at which franking credits that are created by the firm are distributed to shareholders, attached to dividends; and
- *theta* (θ): the value to investors of a franking credit at the time they receive it.

As a result, the actual value of franking credits, represented in the WACC by the parameter 'gamma', depends on the proportion of the franking credits that are created by the firm and that are distributed, and the value that the investor attaches to the credit, which depends on the investor's tax circumstances (that is, their marginal tax rate). As these will differ across investors, the value of franking credits may be between nil and full value (i.e. a gamma value between zero and one). A low value of gamma implies that shareholders do not obtain much relief from corporate taxation through imputation and therefore require a higher pre-tax income in order to justify investment.

Proposals by Service Providers

The Authority did not receive any submission from service providers on this issue.

Assessment

Australian regulators are faced with varying and conflicting theories and evidence on the value of franking credits. Views have been widely divergent among economic regulators across Australia on the three key variables:

c) the distribution rate F, also known as the payout ratio, which ranges from 0.71 to 1.00;

d) the utilisation rate (theta), which ranges from 0.50 to 1.00; and

e) the range adopted for gamma, from which a point estimate is determined (with the lower bound of 0.30 and the upper bound 1.00).

As such, this issue is complex within the Australian regulatory context.

Recent regulatory decisions have employed a gamma value of 0.5 from many regulators across Australia, such as ESC (2008)[120]; OTTER (2007)[121]; QCA (2006)[122]; except for IPART which continues to use a range between 0.3 and 0.5.

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119 P. Monkhouse, 'Adapting the APV Valuation Methodology and the Beta Gearing Formula to the Dividend Imputation Tax System', *Accounting and Finance*, 37, vol. 1, 1997, pp. 69-88.

120 ESC, *Gas access arrangement review 2008-2012*, Final decision – Public version, 7 March 2008, pp.499-509

121 OTTER, *Investigation of prices for electricity distribution services and retail tariffs on mainland Tasmania* – Final report and proposed maximum prices, September 2007, p.152.

122 QCA, *Revised access arrangement for gas distribution networks: Allgas Energy*, Final decision, May 2006, pp.76-77; QCA, *Revised access arrangement for gas distribution networks: Envestra*, Final decision,, May 2006, pp.111-112

The **dividend drop-off method** is the empirical technique that is most commonly used to estimate *theta*. Two well known studies to estimate the value of theta are Hathaway and Officer (2002, 2004)[123] and Beggs and Skeels (2006). Both papers report that the combined value of a $1.00 cash dividend and the attached 43 cent franking credit is about $1.00.

- It is noted that under Australian dividend imputation legislation, a fully-franked dividend has *T*/(1-*T*) franking credits attached to it, where *T* is the relevant corporate tax rate. At a 30% corporate tax rate, a franking credit of 43 cents is attached to a $1.00 dividend.
- They then estimate the value of the $1.00 cash dividend to be around 80 cents and subtract this from the combined value of $1.00, leaving around 20 cents of value to be ascribed to the 43 cent franking credit. This is the basis for the conclusion that *franking credits are worth about half of their face value to investors* in the Australian regulators community.

In its recent final review for electricity, the AER determined the value of gamma of 0.65. The AER considers that the 2006 Beggs and Skeels[124] study provides the most comprehensive, reliable and robust estimate of theta of 0.57 inferred from market prices in the post-2000 period. The AER maintains the view that the methodology provided by the Handley and Maheswaran (2008) study[125] provides a relevant and reliable upper bound estimate of theta in the post-July 2000 period, with a point estimate for theta from tax statistics of 0.74. In addition, a payout ratio of 1.0 has been adopted. The AER then considers that a reasonable estimate of gamma lies in the range 0.57 and 0.74, with a mid-point value of 0.65.

The Authority has previously assumed a value for gamma of 0.5 for water pricing purposes. This is consistent with recent decisions by the Authority and its predecessor agencies, and consistent with the Authority's recent determinations on a WACC methodology for the electricity and rail networks. It is also within the range used by other regulators.[126]

Recommendation

The Authority proposes to adopt the value of imputation credit of **0.65** for the purpose of calculating the rate of return on capital to apply for Water Corporation, Bunbury and Busselton Water Boards. This is consistent with value of imputation credits adopted by the AER in its determination on electricity distribution, which is based on recent studies of the utilisation of franking credits in Australia.

Choice of WACC – Pre-tax Real or Other?

While all regulators of utility industries in Australia use the CAPM to estimate the cost of capital, there is no clear precedent on the form of the WACC to be used (i.e. pre-tax or post-tax, real or nominal).

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123 N. Hathaway and B. Officer, *The Value of Imputation Tax Credits – Update 2004*, Capital Research Pty Ltd, November 2004, pp.13 and 24.

124 D. Beggs and C. L. Skeels, 'Market arbitrage of cash dividends and franking credits', *The Economic Record*, vol.82, no.258, September 2006, p.247.

125 J. C. Handley and K. Maheswaran, 'A measure of the efficacy of the Australian imputation tax system', *The Economic Record*, vol.84, no.264, March 2008, p.90.

126 AER (May 2009), decision, *Review of the weighted average cost of capital parameters for electricity transmission and distribution network service providers*.

- A pre-tax real WACC has been generally preferred by IPART and the ICRC.
- The ACCC and AER have used a post-tax nominal form of WACC in recent decisions.
- The ESC has used a post-tax real form of WACC in recent decisions.

The WACC Formulae Revisited

Together with the post-tax (Vanilla) WACC formula as previously discussed, the following two WACC formulae also used by regulators in Australia.

The Post-Tax (Officer) WACC Formula

This is an estimate of the post-tax (cash) return on assets, which can be expressed as:

$$WACC = R_e \times \frac{E}{V} \times \frac{1-T_c}{\left(1-T_c\left(1-\gamma\right)\right)} + R_d \times \frac{D}{V}\left(1-T_c\right)$$

where T_c is the corporate tax rate and γ is the value of franking credits created (as a proportion of their face value).

The taxation liability is overstated in this formula because it assumes that all of the return on assets is taxed (whereas the portion that is distributed to debt providers is not taxed), and it provides shareholders with additional benefits through the dividend imputation system. Consequently, the Officer WACC is lower than the Vanilla WACC.

The Post-Tax (Monkhouse) WACC Formula

This is an estimate of the post-tax return on assets that the company needs to generate, where the benefits of using the value of franking credits is considered as part of that return.

$$WACC = R_e \times \frac{E}{V} + R_d\left(1-T_c\left(1-\gamma\right)\right) \times \frac{D}{V}$$

Authority's Preferred WACC Methodology

The Authority has a preference for a pre-tax real WACC approach, using a forward transformation approach to convert the post-tax (Officer) WACC formulation to a pre-tax formulation. With this method:

- the nominal post-tax (Officer) WACC is grossed up by $(1-T_c)$ to obtain the pre-tax nominal WACC;[127] and
- the pre-tax nominal WACC is then adjusted for inflation to obtain the pre-tax real WACC.

[127] T_c refers to the company tax rate.

The Authority prefers a pre-tax real WACC approach as this method:

- simplifies financial modelling;
- is consistent with the regulatory practice adopted by Australian water regulators[128] that quarantines regulated businesses from inflation risk in regulated prices;
- is consistent with the preferences of major utilities in Western Australia (e.g. Water Corporation and Western Power); and
- allows consistency across regulated utilities in Western Australia.

A pre-tax WACC may be expressed in real terms (indexed for inflation) or nominal terms (no indexation for inflation). The choice to use a real or nominal WACC depends upon the choice of whether to model costs and returns in real or nominal terms.

[128] For example, both IPART and ICRC use a real pre-tax WACC.

WACC Parameters for Water Corporation, Aqwest and Busselton Water Board

Based on the preceding analyses, the Authority proposes the following WACC parameters to be adopted for the purpose of calculating the rate of return on capital to apply for Water Corporation, Bunbury and Busselton Water Boards.

Table 22.12 Proposed WACC Parameters for Water Corporation, Aqwest and Busselton Water

Parameter	Current Decision (Nov 2005)		Water Corporation's Proposal (September 2008)			Authority's Decision (11 June 2009)	
	Water Corporation	Water Boards	Low	Medium/Low	Medium	Water Corporation	Water Boards
Nominal Risk Free Rate	5.23%	5.23%	6.34%	6.34%	6.34%	**5.52%**	**5.52%**
Real Risk Free Rate)	2.42%	2.42%	3.49%	3.49%	3.49%	**3.07%**	**3.07%**
Inflation Rate	2.74%	2.74%	2.75%	2.75%	2.75%	**2.38%**	**2.38%**
Debt Proportion	60%	40%	60%	60%	60%	**60%**	**40%**
Equity Proportion	40%	60%	40%	40%	40%	**40%**	**60%**
Cost of Debt; Debt Risk Premium	1.00%	1.00%	2.10%	2.45%	2.70%	**2.600%**	**2.800%**
Cost of Debt; Debt Issuing Cost	0.125%	0.125%	0.13%	0.13%	0.13%	**0.125%**	**0.125%**
Cost of Debt; Risk Margin	1.125%	1.125%	2.23%	2.58%	2.83%	**2.725%**	**2.925%**
Australian Market Risk Premium	6.00%	6.00%	5.50%	6.00%	6.00%	**6.50%**	**6.50%**
Equity Beta	0.8	0.6	0.65	0.8	0.9	**0.65**	**0.65**
Corporate Tax Rate	30%	30%	30%	30%	30%	**30%**	**30%**
Franking Credit	50%	50%	50%	50%	50%	**65%**	**65%**
Nominal Pre Tax WACC	8.53%	8.77%	9.80%	10.59%	11.02%	**9.16%**	**9.69%**
Real Pre Tax WACC	**5.63%**	**5.87%**	**6.87%**	**7.63%**	**8.05%**	**6.62%**	**7.14%**

23 Appendix G. Credit Rating

The Authority has investigated the financial impact on each service provider from the recommended tariffs. The framework for this investigation is based the on the credit ratings criteria from Standard and Poor's, and the current approach by IPART has been used as a cross-check. This section briefly explains the approach which the Authority has used to determine credit ratings for its services providers for modelling purposes.

Standard and Poor's has developed the matrix in which the business risk and financial risk of the firms can be assessed. In terms of business risk, factors are considered such as:

- country risk;
- industry factors;
- competition position; and
- profitability/ peer group comparisons.

In a similar approach, factors included in the consideration of the company's financial risk include:

- governance/risk tolerance/financial policies;
- accounting;
- cash flow adequacy;
- capital structure/ asset protection; and
- liquidity/short term factors.

Standard and Poor's indicates that there is no predetermined weight for each factor which will vary from situation to situation. The matrix is presented as below.

Table 23.1 Business Risk/Financial Risk

Financial Risk Profile					
Business Risk Profile	**Minimal**	**Modest**	**Intermediate**	**Aggressive**	**Highly Leveraged**
Excellent	AAA	AA	A	BBB	BB
Strong	AA	A	A-	BBB-	BB-
Satisfactory	A	BBB+	BBB	BB+	B+
Weak	BBB	BBB-	BB+	BB-	B
Vulnerable	BB	B+	B+	B	B-
Financial Risk Indicative Ratios*	**Minimal**	**Modest**	**Intermediate**	**Aggressive**	**Highly Leveraged**
Cash flow (Funds from operations/ debt)(%)	Over 60	45-60	30-45	15-30	Below 15
Debt leverage (Total debt/Capital) (%)	Below 25	25-35	35-45	45-55	Over 55
Debt/EBITDA (x)	<1.4	1.4-2.0	2.0-3.0	3.0-4.5	>4.5

* Fully adjusted historically demonstrated and expected to continue consistently.

Source: Standard & Poor's, Corporate Ratings Criteria 2008, p22.

The first ratio in the above matrix is known as the cash flow ratio, which is used to measure the ability of the company to generate cash from its operations to service its outstanding debt principal and other obligations. *Funds from operations* (FFO) is defined as operating profit plus depreciation and amortization less income tax paid, plus/(minus) net non-cash abnormal losses/(gains), plus/(minus) net losses/(gains) on the sale of assets. It is generally accepted that cash flow measures tend to overcome distortions that can be caused by differences in accounting for non-cash charges. The other measure that Standard & Poor's uses is the free operating cash flow (FOC)-to-total debt.

The second ratio, debt leverage, refer to the capital structure, which is commonly used to indicate the extent to which the company is funded by debt or equity. The structure of a company's debt is also evaluated (for example, current debt-to-total debt and secured debt-to-total debt), which reveals the presence of refinancing risks and the risks facing various categories of debt holders.

The last ratio, Debt/EBITDA, is a measure of a company's ability to pay off its incurred debt. This ratio gives the investor the approximate amount of time that would be needed to pay off all debt. This ratio is a common metric used by credit rating agencies to assess the probability of defaulting on issued debt. A high debt/EBITDA ratio suggests that a firm may not be able to service their debt in an appropriate manner and can result in a lowered credit rating. Conversely, a low ratio can suggest that the firm may want take on more debt if needed and it often warrants a relatively high credit rating.

IPART has mainly used four financial indicators to determine the credit rating for their services providers. They are: (i) Funds from operation (FFO) interest cover (the ratio between sum of FFO and interest paid and interest paid); (ii) FFO/ Net Debt; (iii) Debt Gearing (the ratio between Total debt and Regulatory asset value); and (iv) Pre-tax interest cover (the ratio between EBIT less Contributed assets and Interest paid.

The implied credit rating for Water Corporation, Aqwest and Busselton Water Boards in 2013 can be summarised as below.

Table 23.2 Implied Credit Ratings of the Water Corporation and the Water Boards in 2013

	Water Corporation	Bunbury Water Board	Busselton Water Board
Funds from Operation FFO to Net Debt	0.2	3.7	2.8
Debt leverage (Debt less Cash to RAV)	0.2	0.0	0.0
Debt to EBITDA	2.9	0.2	0.4
FFO to Debt	5.0	10.00	10.00
Net Debt leverage (Debt to RAV)	9.0	10.00	10.00
Net Debt to EBITDA	5.0	10.00	10.00
Weighted Average	6.3	10.00	10.00
FFO to Net Debt	BBB	AA	AA
Net Debt leverage (Net Debt to RAV)	A+	AA	AA
Net Debt to EBITDA	BBB	AA	AA
Weighted Average Rating	A-	AA	AA

24 Appendix H. Cost-Effectiveness of Rebates

The following table summarises the different types of rebate products and maximum rebates.

Table 24.1 Rebate Products and Maximum Rebates

Rebate Products	Maximum Rebate
Water Recycling Products	
Greywater re-use systems	$500 or 50 per cent of purchase/installation cost of approved system, whichever is the lesser (one per household)
Alternative Water Sources	
Domestic rainwater tanks	
- 600 litres or more unplumbed	$50 per tank (one per household)
- 2,000 litres or more plumbed for toilet and/or washing machine use	$600 or 50 per cent of purchase and installation costs, whichever is the lesser (one per household)
Domestic garden bores	
- New garden bore	$300 or 50 per cent of installation cost, whichever is the lesser (one per household)
- Shared bore	$300 or 50 per cent of installation cost shared equally between households sharing the bore, whichever is the lesser (one per household)
- Rebores	$300 or 50 per cent of refurbishment cost, whichever is the lesser (one per household)
Water Efficiency Products	
Waterwise garden irrigation systems	$300 or 50 per cent of installation cost, whichever is the lesser (one per household)
Rain sensors	$20 per rain sensor (one per household)
Subsurface irrigation systems	$10 per 30m roll of subsurface irrigation pipework (up to 10 rolls per household)
Waterwise garden assessments	$30 per assessment (one per household)
Swimming pool covers	$200 or 50 per cent of total cost, whichever is the lesser (one per household)
Flow regulators	$2 per flow regulator rated 3 Stars or above, up to $20 per household
Washing machines	$150 rebate on washing machines rated 4.5 Stars or above (one per household)

Assessment

The Department of Treasury and Finance (DTF) has provided to the Authority a preliminary assessment of the effectiveness of WaterWise rebates. This analysis has been reviewed and adapted by the Authority's consultants, Economic Research Associates. The assumptions and results of the analysis are shown in the tables at the end of this appendix.

The structure of the analysis is as follows. For each water saving mechanism or unit an estimate is made of:

- the market price with and without the rebate;
- sales, with and without the rebate;
- the water saving per unit and aggregate saving based on units sold because of the rebate;
- the resource benefit to society of this water saving, based on the cost of increasing potable water supplies (up to $2 per kL, for desalination) as a measure of the opportunity value of water saved; and
- the full cost to society of achieving the water savings based on acquisition, installation and operation of the water saving device and rebate program administration costs.

The cost effectiveness of each mechanism is based on comparing the estimated value of water saving benefits per kL with the estimated costs per kL of water saved. The ranking of each mechanism is based on the cost per kL of water saved.

Assumptions on Water Savings

The amount of water actually saved by rebate products will vary between users and will depend on how the products are used. The assumptions on the amount of water savings used in the DTF analysis have been based on information from the Department of Water and the Water Corporation, including a recent study of household water consumption in Perth that compared households with rebate products to those without rebate products.

- **Sub-surface irrigation systems.** Sub-surface irrigation systems *increase* the amount of water used, on average, as these systems are probably used more frequently and for longer periods than above-ground irrigation systems. The analysis therefore assumes an increase in water consumption of 52 kL per year for sub-surface irrigation systems. However, if used in accordance with the watering schedules and guidelines sub-surface irrigation can result in water savings.
- **Greywater re-use systems.** Households with greywater re-use systems also have a higher consumption of potable water than households without greywater systems (by an average of 62 kL per unit per annum). The reasons for this are unclear. One possibility may be behavioural: users with greywater systems may feel less compelled to save water in the house as the water is being re-used. Another possibility is that users buy greywater systems because they have specific high water needs (e.g. high water demand gardens). However, greywater systems could result in water savings if they are used to directly replace potable water usage. Retrofitting versus fitting at the time of building may also have an influence. In the latter case, for example, the garden can be designed to be water efficient with the use of greywater. It should also be noted that water use estimates are based on the small number of greywater re-use systems installed in Perth, and may not be statistically significant.

- **Swimming pool cover upgrades.** Upgrading swimming pool covers, from non-water-wise covers to water-wise covers that are endorsed for rebates, also appears to *increase* water consumption (by around 27 kL a year).[129] This could be due to the higher grade pool covers raising pool temperatures, resulting in the pools being used more often. However, households that have no pool cover and purchase a new pool cover will save around 29 kL per year.
- **Washing machines.** The Water Corporation estimates that switching from a AAA-rated washing machine to a 4.5-Star rated washing machine can result in an annual water saving of around 23 kL. However, the majority of washing machines in the market today are already 4-Star rated (which is more water efficient than AAA-rated), so if rebates encourage customers to switch from a 4-Star machine to a 4.5-Star machine, the water saving will be less (around 2.4 kL per annum).
- **Rainwater tanks.** The Water Corporation estimates that a 2,500 litre rainwater tank can result in an annual water saving of 61 kL. However, a recent National Water Commission study on the cost effectiveness of rainwater tanks indicated average savings of 28 kL per annum for a 2,500L tank.[130] The Authority has used the higher figure for water savings (61 kL), while noting that the water savings could be less than this.

The Consumer's Perspective

From the consumer's perspective, whether a water saving device is effective depends on:

- the cost of owning and operating the device;
- the benefits from saving water which are comprised of:
  - water expenditure savings, and
  - any increase in utility associated with making a positive contribution to the environment.

The utility gains are difficult to measure. The expenditure savings depend on the volume of water saved and the price paid for water. The latter is a function of the tiered regulatory tariff and how the bill is affected by a change in demand by the consumer. The 2008/09 consumption charges are 82.8 c/kL and 99.7 c/kL for tiers 3 and 4 (see Table 24.2). Therefore, a consumer saving one kL in tier 2 needs the cost per kL of water saving to be less the 82.8 c/kL. A consumer saving one kL in tier 3 needs the cost per kL of water saving to be less the 99.7 c/kL.

Table 24.2 Water Corporation Metropolitan Residential Consumption Charges

Metropolitan Residential Consumption per Annum (kL)	Consumption Charges, 2008/09 (c/kL)
0-150	64.3
151-350	82.8
351-550	99.7
551-950	142.3
over 950	171.4

Source: Water Corporation

[129] Swimming pool covers eligible for rebates are those that are endorsed under the Smart Approved Watermark Scheme and with a minimum warranty of 8 years.

[130] Marsden Jacob Associates (March 2007), *The Cost-Effectiveness of Rainwater Tanks in Urban Australia*, a study carried out for the National Water Commission.

The Societal Perspective

From society's perspective, whether a water saving device is effective depends on:

- the benefits from saving water;
- the cost of owning and operating the device; and
- where rebates are in operation, the costs of the rebate scheme.[131]

The issue here relates to the fact that the cost of sourcing new potable supply water for the metropolitan area is estimated to be as high as $2 per kL (for desalination). However, the price paid by the consumer is less than this. Hence, a kL of water saved is more valuable from society's perspective than from the consumer's perspective. The opportunity value of water saved from society's perspective is up to $2 per kL. The direct benefit to the consumer is between $0.82 to around $1 per kL.

Therefore where a consumer saving a kL in tier 2 needs the cost per kL of water saving to be less than 82.8 c/kL, the societal perspective indicates that it is worth doing if the cost per kL of water saving is less than, say, $2 per kL.

Hence, the assessment of water saving devices will differ depending on whether it is taken from a consumer's perspective or society perspective. Water saving devices that appear uneconomic to the consumer may be economic from society's perspective.

General Caveats

Before considering the implications of the analysis, two general issues with the analysis need to be noted.

Data was difficult to collect. Water use and water savings estimates are not widely available and estimates will vary across jurisdictions reflecting the actual circumstances in the water system. The estimates used by DTF were derived largely from information provided by the Department of Water and the Water Corporation. Indicative prices, installation costs and operating costs were derived from simple price "ring arounds" of suppliers and from the Department of Water. Administration costs came from the Water Corporation. Data on the number of rebates came from the Water Corporation. Data on water savings in kL per annum was based on information provided by Water Corporation.

Without a specific study it appears that no better indicative data would be available.

The first general issue relates to assessing the demand for devices. Rebates data indicates the number of rebates. Rebates reduce the price to the consumer from the "without rebate" price to the "with rebate" price. "Without rebate" sales figures are needed to approximate the demand curve. A price elasticity of -1 was assumed for all devices to estimate "without rebate" sales (that is, a one per cent increase in the price result in a one per cent decrease in demand). Given the "with rebate" sales, the price reduction due to the rebate and the price elasticity of demand allows an estimate of the effect of the price reduction on sales. This is the number of units due to the rebate, and will be less than the number of units receiving rebates. Almost certainly this price elasticity would vary between devices. If it does, then the demand response may be under or overestimated based on an assumed price elasticity of -1. This affects the estimate of the number of units attributable to the rebate and the estimate of the consequent water savings.

[131] The cost of rebates is included in the cost to society, on the assumption that government is budget constrained, so that the money spent on rebates has an opportunity cost. If government is not budget constrained, the cost of the rebate could be viewed as a transfer from tax payers to rebate customers.

However, no meaningful price elasticity data appears to be available. Hence, an assumption was required and the DTF assumption was intended to be neutral.

If the demand curve is downward sloping then there is a consumer surplus gain based on the price fall and quantity increase. That is, some consumers are acquiring water saving devices at a price below the price that they would be prepared to pay. This benefit to consumers of water saving devices has been ignored in the analysis. If it was included, it would increase the estimated benefits. However, without a reliable price elasticity estimate the calculation would be largely spurious. A preliminary assessment outlined below indicates that this does not appear to be a material issue.

The devices attracting rebates need to be considered in two broad groups:

- specially acquired and operated devices such as rainwater tanks and pool covers ("stand-alone devices"); and
- compulsory devices built into appliances, such as water saving dishwashers and washing machines ("embedded water saving devices").

Specific Water Savings Expenditures for Stand-Alone Devices

Stand-alone devices include pool covers, rainwater tanks, greywater re-use systems, rain sensors and flow regulators. The following analysis looks at the estimated social and consumer benefits for these devices, based on the data in the DTF analysis.

Consumer Perspective

The consumer bears the acquisition cost (net of rebate), the installation and operation costs. From the consumer's perspective, several devices have a cost per kL of less than $1 per kL. These are:

- rain sensors;
- garden assessments; and
- flow regulators.

The remaining devices (pool covers, rainwater tanks, greywater re-use systems) all have a cost per kL greater than $1. Hence, based on DTF's costings, consumers could justify the purchase of rain sensors, garden assessments and flow regulators based on the value of water saved, but not swimming pool covers, bores or rainwater tanks.

Societal Perspective

The DTF estimated that only rain sensors, garden assessments and flow regulators have estimated costs less than $2 per kL (the cost of desalination) indicating that they are cost effective. The others all have estimated costs greater than $2 per kL, indicating that they are cost ineffective. Rebates for rainwater tanks are an expensive source of water (around $4 to $5 per kL).

For products that may not produce water savings (e.g. greywater re-use systems, sub-surface irrigation systems and swimming pool upgrades), rebates may actually be counter-productive.

These devices are entirely directed at water savings. Therefore, it can be assumed that the only reason they are bought is to save water. In this case, the whole purchase price, installation cost, and operating cost can be attributed to water saving objectives.

The rebate lowers the purchase price. The rebate splits the resource cost as reflected in the purchase price between the Government (rebate) and consumer (price less rebate). The consumer bears the installation and operating costs.

Consumers will derive some consumer surplus benefits from the increased consumption. However, a preliminary assessment indicates that adding these benefits would do little to the analysis. The consumer surplus gains add between 6 per cent and 25 per cent to the estimated societal benefit but this does not change the assessment of any devices. Rain sensors and garden assessments are still the only ones with positive net benefits.

Summary

Even allowing for the caveats on price elasticity and consumer surplus, the conclusion from the analysis appears robust. Apart from rain sensors, garden assessments and flow regulators, devices acquired to specifically save water are inefficient in that the resource cost to achieve the savings exceeds the value of the benefits as measured by the opportunity value of producing potable water for the metropolitan area. However, from the perspective of the individual consumer, as opposed to society, more devices appear cost effective. If looked at from the perspective of a water provider like the Water Corporation, devices are cost effective if the combined rebate and administration cost per kL of water saved is less than $2.

Embedded Water Saving Devices

Some water saving devices are embedded in other products and are not separable from them. In the DTF analysis, the device that falls into this category is the water saving washing machine. The conclusion here is the same as for the other devices – the resource cost per kL of water saving achieved exceeds the opportunity value of the water saved.

The analysis assumes that, embedded in a washing machine price of $1,754, is a water saving device costing $372 ($150 rebate and $222 paid by the consumer). Given this assumption, the key is then the amount of water saved for the expenditure of the $372 plus rebate administration costs. The analysis suggests that relatively little water is saved, with the result that the cost of water saved may be as high as $128 per kL, well above the estimated cost of producing more potable water (up to $2 per kL).

However, there are two further points worth considering.

It is arguable that where water saving technology is built into a product as the market norm, it effectively adds nothing to the product price. The water saving requirement is embedded at the design and manufacturing stages and is not an “add on”. This may particularly apply to products like washing machines, which are imported and have high level water saving capacities set in other jurisdictions.

In these circumstances it could be argued that the extra cost to the consumer of acquiring a water saving washing machine is minimal. It could also be argued that consumers would choose water saving machines anyway, all other things being equal. The argument for the rebate is therefore reduced, because as new machines are brought to market and bought by consumers they would be more water efficient as a normal market outcome.

The argument for the rebate in this case may not be eliminated entirely because the rebate may bring forward new purchases and encourage early replacement of existing machines, thereby expediting greater water saving. However, considerably more

information would be needed to assess this proposition thoroughly, although given the available evidence, it would be unlikely to be a cost effective way of saving water.

Summary

For embedded water saving devices, the analysis ascribes part of the product price as the "price" for the embedded water saving technology. Under this scenario, embedded devices in washing machines still have a resource cost greater than the opportunity value of water saved for the metropolitan area. However, if the market is moving to embed water saving technologies into new machines because of regulation or because of market demand, then the case for these rebates is reduced still further.

Analysis Assumptions and Results – Rebate Products, 2003-2008

Table 24.3 Rebate Products (2003-2008) – Assumptions for Analysis *

Products - 2003-2008	Product Details			Price of Product	Running Cost (Annual)	Costs					Total Cost	Volume of Water Saved over Product Life (kL per Unit)	Quantities			Elasticity		
	Lifespan of Product	Annual Water Saved (per Unit, kl)	Number of Rebates			Rebate	Consumer Premium	Instal-lation Cost	Program Cost	Running Cost (PV over Lifespan)			Units Without Rebate	Units With Rebate	Units Due to Rebate	% Change in Demand	% Change in Price	Elas-ticity
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
Swimming Pool Cover (Upgrade)	8	-27.2	23,320	$574	-	$200	$374		$16.00		$590	-218	17,986	23,320	5,334	30%	-30%	-1
Swimming Pool Cover (New)	8	29.0	23,320	$574	-	$200	$374		$16.00		$590	232	17,986	23,320	5,334	30%	-30%	-1
Rain Sensor	10	20.0	8,956	$35	-	$20	$15		$2.56		$38	200	6,210	8,956	2,746	44%	-44%	-1
Subsurface Irrigation System	10	-51.8	6,520	$42	-	$10	$32		$1.17		$43	-518	5,381	6,520	1,139	21%	-21%	-1
Garden Assessment	10	23.0	51	$70	-	$30	$40		$3.50		$74	230	38	51	13	35%	-35%	-1
Flow Regulator	15	3.0	59	$30	-	$20	$10		$0.49		$30	45	39	59	20	50%	-50%	-1
Domestic Garden Bore	15	105.4	22,723	$2,233	$50	$300	$1,933		$35.39	$536	$2,804	1,581	20,182	22,723	2,541	13%	-13%	-1
Greywater Re-use System	10	-62.3	184	$3,050	$150	$500	$2,550	$300	$56.90	$1,254	$4,661	-623	160	184	24	15%	-15%	-1
Washing Machine	8	2.4	54,253	$1,754	-	$150	$222		$17.68		$390	19	50,140	54,253	4,113	8%	-8%	-1
Rainwater Tank (600L)	20	21.2	14,386	$767	$20	$50	$717		$12.78	$249	$1,030	424	13,532	14,386	854	6%	-6%	-1
Rainwater Tank (2500L)	20	61.0	14,386	$1,889	$20	$600	$1,289	$300	$12.78	$249	$2,451	1,220	11,291	14,386	3,095	27%	-27%	-1

Table 24.4 Rebate Products (2003-2008) – Costs per Kilolitre of Water Saved **

Products - 2003-2008	Volume of Water Saved over Product Life (kL per Unit)	Number of Rebates	Units Due to Rebate	Consumer		Government		Society	
				Cost of Water Saved	Cost per kL	Cost of Water Saved	Cost per kL	Cost of Water Saved	Cost per kL
	S	T	U	V = (G+H+J)*T	V/(S*T)	W=(F+I)*T	W/(S*U)	X = W + (G+H+J)*U	X/(S*U)
Swimming Pool Cover (Upgrade)	-218	23,320	5,334	$8,732,654	n/a	$5,037,120	n/a	$7,034,364	n/a
Swimming Pool Cover (New)	232	23,320	5,334	$8,732,654	$1.61	$5,037,120	$4.07	$7,034,364	$5.68
Rain Sensor	200	8,956	2,746	$136,310	$0.08	$202,047	$0.37	$243,848	$0.44
Subsurface Irrigation System	-518	6,520	1,139	$210,066	n/a	$72,828	n/a	$109,541	n/a
Garden Assessment	230	51	13	$2,040	$0.17	$1,709	$0.56	$2,241	$0.73
Flow Regulator	45	59	20	$590	$0.22	$1,209	$1.37	$1,406	$1.59
Domestic Garden Bore	1,581	22,723	2,541	$56,094,281	$1.56	$7,621,067	$1.90	$13,893,256	$3.46
Greywater Re-use System	-623	184	24	$755,138	n/a	$102,470	n/a	$201,830	n/a
Washing Machine	19	54,253	4,113	$12,038,613	$11.65	$9,097,143	$116.17	$10,009,788	$127.82
Rainwater Tank (600L)	424	14,386	854	$13,907,403	$2.28	$903,153	$2.49	$1,728,682	$4.77
Rainwater Tank (2500L)	1,220	14,386	3,095	$26,445,761	$1.51	$8,815,453	$2.33	$14,504,957	$3.84

= products less than $2/kL

Notes: * Annual water savings are based on most recent Water Corporation or Department of Water information. Swimming pool cover upgrades, sub-surface irrigation systems and greywater re-use systems appear to increase water consumption. Water savings for washing machines are based on the difference between 4-star and 4.5-star washing machines. See text for discussion.

** Costs per kL water saved for swimming pool cover upgrades, sub-surface irrigation systems and greywater re-use systems not applicable as these products appear to increase water use, rather than producing water savings. Costs to society include rebate costs on the assumption that government is budget constrained (i.e. rebates have an opportunity cost).

Source: Department of Treasury and Finance and Economic Regulation Authority

25 Appendix I. Schedules of Prices

Schedule 1: Recommended Price Paths for Water and Wastewater Services – Water Corporation

Table 25.1 Recommended Water Corporation Metropolitan Residential and Commercial Water Tariffs (Real Dollar Value of June 2009)

	2010	2011	2012	2013
Residential Fixed Charge				
Fixed Tariff	195.74	157.02	118.31	79.59
Residential Demand Charge by Volume				
0 – 150	0.709	0.939	1.170	1.400
151 – 200	0.860	1.183	1.507	1.830
201 – 250	0.860	1.183	1.507	1.830
251 – 300	0.860	1.183	1.507	1.830
301 – 350	0.860	1.183	1.507	1.830
351 – 400	0.996	1.274	1.552	1.830
401 – 450	0.996	1.274	1.552	1.830
451 – 500	0.996	1.274	1.552	1.830
501 – 550	0.996	1.381	1.765	2.150
551 – 650	1.501	1.718	1.934	2.150
651 – 750	1.501	1.718	1.934	2.150
750 – 950	1.501	1.718	1.934	2.150
951 – 1150	1.738	1.875	2.013	2.150
1150 – 1550	1.738	1.875	2.013	2.150
1550 – 1950	1.738	1.875	2.013	2.150
>1950	1.738	1.875	2.013	2.150
Commercial Fixed Charge by Meter Size				
20mm	453.02	328.54	204.07	79.59
25mm	707.95	513.35	318.85	124.36
30mm	1,019.73	739.22	459.15	179.08
40mm	1,811.88	1,314.17	816.26	318.36
50mm	2,831.61	2,053.39	1,275.41	497.44
80mm	7,249.46	5,256.67	3,265.06	1,273.44
100mm	11,326.43	8,213.55	5,101.65	1,989.75
150mm	25,484.47	18,480.49	11,478.72	4,476.94
200mm	45,306.70	32,854.21	20,406.61	7,959.00
250mm	70,791.17	51,334.70	31,885.32	12,435.94
300mm	101,939.83	73,921.98	45,914.86	17,907.75
350mm	138,750.73	100,616.02	62,495.23	24,374.44
20mm meter (Strata)	195.74	157.02	118.31	79.59
Commercial Demand Charge by Volume (kL)				
0 – 600	1.144	1.373	1.601	1.830
601 – 1,100,000	1.192	1.373	1.601	1.830
over 1,100,000	1.180	1.373	1.601	1.830

Table 25.2 Recommended Water Corporation Metropolitan Residential and Commercial Water Tariffs (Forecast Nominal Dollar Value, Year Ending 30 June)

	2010	2011	2012	2013
Residential Fixed Charge				
Fixed Tariff	200.40	164.59	126.96	87.44
Residential Demand Charge by Volume (kL)				
0 - 150	0.726	0.985	1.255	1.538
151 - 200	0.880	1.240	1.617	2.011
201 - 250	0.880	1.240	1.617	2.011
251 - 300	0.880	1.240	1.617	2.011
301 - 350	0.880	1.240	1.617	2.011
351 - 400	1.020	1.336	1.666	2.011
401 - 450	1.020	1.336	1.666	2.011
451 - 500	1.020	1.336	1.666	2.011
501 - 550	1.020	1.447	1.895	2.362
551 - 650	1.537	1.800	2.075	2.362
651 - 750	1.537	1.800	2.075	2.362
750 - 950	1.537	1.800	2.075	2.362
951 - 1150	1.779	1.965	2.160	2.362
1150 - 1550	1.779	1.965	2.160	2.362
1550 - 1950	1.779	1.965	2.160	2.362
>1950	1.779	1.965	2.160	2.362
Commercial Fixed Charge by Meter Size (mm)				
20	463.80	344.37	218.99	87.44
25	724.80	538.07	342.17	136.63
30	1,044.00	774.83	492.72	196.74
40	1,855.00	1,377.47	875.94	349.77
50	2,899.00	2,152.29	1,368.66	546.51
80	7,422.00	5,509.87	3,503.77	1,399.07
100	11,596.00	8,609.17	5,474.65	2,186.04
150	26,091.00	19,370.63	12,317.96	4,918.60
200	46,385.00	34,436.68	21,898.59	8,744.18
250	72,476.00	53,807.31	34,216.55	13,662.78
300	104,366.00	77,482.53	49,271.83	19,674.40
350	142,053.00	105,462.34	67,064.43	26,779.05
20mm meter (Strata)	200.40	164.59	126.96	87.44
Commercial Demand Charge by Volume (kL)				
0 – 600	1.171	1.439	1.718	2.011
601 – 1,100,000	1.220	1.439	1.718	2.011
Over 1,100,000	1.208	1.439	1.718	2.011

Table 25.3 Recommended Water Corporation Metropolitan Residential and Commercial Wastewater Tariffs (Real Dollars of June 2009).

	2010	2011	2012	2013
Residential Fixed Charge				
Average Fixed Tariff	548.49	558.64	568.79	578.95
Commercial Fixed Charge				
First Fixture	618.68	629.92	641.38	653.04
Second Fixture	264.80	269.61	274.51	279.50
Third Fixture	353.68	360.11	366.66	373.33
Over 3 Fixtures (each)	384.55	391.54	398.66	405.91
Strata Title	384.55	391.54	398.66	405.91
First Fixture, Aged Homes	166.24	169.27	172.34	175.48
Over 1 Fixture, Aged Homes	73.06	74.39	75.74	77.12
First Fixture, Exempt & Charitable	166.24	169.27	172.34	175.48
Vacant land	211.17	215.01	218.92	222.90
Commercial Demand Charge				
>200kL	2.274	2.315	2.357	2.400

Table 25.4 Recommended Water Corporation Metropolitan Residential and Commercial Wastewater Tariffs (Forecast Nominal Dollar Value, Year Ending 30 June)

	2010	2011	2012	2013
Residential Fixed Charge				
Average Fixed Tariff	561.54	585.55	610.38	636.06
Commercial Fixed Charge				
First Fixture	633.40	660.26	688.27	717.46
Second Fixture	271.10	282.60	294.58	307.08
Third Fixture	362.10	377.46	393.47	410.16
Over 3 Fixtures (each)	393.70	410.40	427.80	445.95
Strata Title	393.70	410.40	427.80	445.95
First Fixture, Aged Homes	170.20	177.42	184.94	192.79
Over 1 Fixture, Aged Homes	74.80	77.97	81.28	84.73
First Fixture, Exempt & Charitable	170.20	177.42	184.94	192.79
Vacant land	216.20	225.37	234.93	244.89
Commercial Demand Charge				
>200kL	2.33	2.43	2.53	2.64

Table 25.5 Residential Usage Charges for Country Towns (Real Dollars of June 2009)

Note: Charges for country commercial customers are at the highest residential tariff rate.

	Usage (kL / year)			
Towns in South	**1-150**	**151-300**	**301-550**	**551+**
Towns in North	**1-350**	**351-500**	**501-750**	**751+**
Class 1	1.40	1.43	1.45	1.48
Class 2	1.40	1.83	1.94	2.05
Class 3	1.40	1.83	2.33	2.83
Class 4	1.40	1.83	2.87	3.91
Class 5	1.40	1.83	3.62	5.41

Table 25.6 Area Based Metropolitan Drainage Charges (Real Dollars of June 2009)

	2010/11 ($/year)
Low (All residential plus non-residential less than 1,000 sqm)	87.21
Medium (non-residential between 1,000 and 10,000 sqm)	436.04
High (non-residential above 10,000 sqm)	872.07

Schedule 2: Recommended Price Paths for Water Services – Aqwest

Table 25.7 Recommended Aqwest Residential and Commercial Water Tariffs (Real Dollars of June 2009)

	2010	2011	2012	2013
Fixed Charge				
Residential	101.58	94.25	86.92	79.59
Non-Residential by Meter Size (mm)				
20	379.96	279.83	179.71	79.59
25	592.89	437.24	280.80	124.36
40	1,521.78	1,119.34	718.85	318.36
50	2,378.39	1,748.97	1,123.20	497.44
80	6,090.06	4,477.35	2,875.40	1,273.44
100	9,515.53	6,995.87	4,492.81	1,989.75
150	21,411.41	15,740.70	10,108.82	4,476.94
Demand Charge by Volume (kL)				
Residential				
0 - 150	0.420	0.463	0.511	0.564
151 - 350	0.781	0.862	0.951	1.049
351 - 500	1.113	1.228	1.355	1.495
501 - 700	1.475	1.627	1.795	1.980
701 - 1000	1.768	1.950	2.150	2.150
Over 1000	2.588	2.150	2.150	2.150
Non-Residential by Tranche				
0 - 100kL	0.801	1.032	1.264	1.495
over 1000kL	1.182	1.286	1.391	1.495

Table 25.8 Recommended Aqwest Residential and Commercial Water Tariffs (Forecast Nominal Dollar Value, Year Ending 30 June)

	2010	2011	2012	2013
Fixed Charge				
Residential	104.00	98.79	93.28	87.44
Non-Residential by Meter Size (mm)				
20	389.00	293.31	192.85	87.44
25	607.00	458.30	301.33	136.63
40	1,558.00	1,173.25	771.41	349.77
50	2,435.00	1,833.21	1,205.32	546.51
80	6,235.00	4,693.01	3,085.63	1,399.07
100	9,742.00	7,332.83	4,821.29	2,186.04
150	21,921.00	16,498.87	10,847.90	4,918.60
Demand Charge by Volume (kL)				
Residential				
0 - 150	0.430	0.486	0.549	0.620
151 - 350	0.800	0.904	1.021	1.153
351 - 500	1.140	1.288	1.454	1.643
501 - 700	1.510	1.706	1.926	2.176
701 - 1000	1.810	2.044	2.307	2.362
Over 1000	2.650	2.254	2.307	2.362
Non-Residential by Tranche				
0 - 100kL	0.820	1.082	1.356	1.643
over 1000kL	1.210	1.348	1.492	1.643

Schedule 3: Recommended Price Paths for Water Services – Busselton Water

Table 25.9 Recommended Busselton Residential and Commercial Water Tariffs (Real Dollars of June 2009)

	2010	2011	2012	2013
Fixed Charge				
Residential	134.28	116.05	97.82	79.59
Non-Residential By Meter Size (mm)				
20	429.87	313.11	196.35	79.59
25	670.92	489.23	306.80	124.36
32	966.82	529.15	331.83	134.51
40	1,720.74	1,252.44	785.40	318.36
50	2,687.56	1,956.93	1,227.19	497.44
80	6,882.84	5,009.75	3,141.60	1,273.44
100	10,754.19	7,827.74	4,908.74	1,989.75
150	24,090.06	17,612.40	11,044.67	4,476.94
Demand Charge by Volume (kL)				
Residential				
0 - 150	0.537	0.627	0.733	0.855
151 - 350	0.752	0.878	1.026	1.198
351 - 550	0.830	0.969	1.132	1.322
551 - 750	0.996	1.163	1.359	1.586
751 - 1150	1.651	1.928	2.150	2.150
1151 - 1550	2.344	2.150	2.150	2.150
1551 - 1950	2.706	2.150	2.150	2.150
Over 1950	3.145	2.150	2.150	2.150
Non-Residential by Tranche				
0 - 1000kL	0.967	1.085	1.204	1.32
Over 1000kL	1.367	1.352	1.337	1.32

Table 25.10 Recommended Busselton Residential and Commercial Water Tariffs (Forecast Nominal Dollar Value, Year Ending 30 June)

	2010	2011	2012	2013
Fixed Charge				
Residential	137.48	121.64	104.97	87.44
Non-Residential By Meter Size (mm)				
20	440.10	328.19	210.71	87.44
25	686.89	512.80	329.23	136.63
32	989.83	554.64	356.09	147.78
40	1,761.69	1,312.76	842.82	349.77
50	2,751.52	2,051.19	1,316.91	546.51
80	7,046.65	5,251.05	3,371.29	1,399.07
100	11,010.14	8,204.77	5,267.63	2,186.04
150	24,663.40	18,460.73	11,852.18	4,918.60
Demand Charge by Volume (kL)				
Residential				
0 - 150	0.550	0.658	0.786	0.940
151 - 350	0.770	0.921	1.101	1.316
351 - 550	0.850	1.016	1.215	1.452
551 - 750	1.020	1.219	1.458	1.743
751 - 1150	1.690	2.020	2.307	2.362
1151 - 1550	2.400	2.254	2.307	2.362
1551 - 1950	2.770	2.254	2.307	2.362
Over 1950	3.220	2.254	2.307	2.362
Non-Residential by Tranche				
0 - 1000kL	0.990	1.138	1.292	1.452
over 1000kL	1.400	1.417	1.435	1.452

26 Appendix J. Impacts on Customers

Summary of Impacts of Recommendations on Average Annual Payments for Water Corporation, Aqwest and Busselton Water Customers

The following table summarise the impacts of the Authority's recommendations on the average annual payments of customers for each of the service providers.

All dollars are in real values of June 2009.

	Average Annual Payment		Average Annual Variation (2019/10 to 2012/13)	
	2009/10	2012/13	$	%
Household Water Bills				
Water Corporation, Perth	416	553	45	10%
Water Corporation, Country	500	598	33	6%
Aqwest, Bunbury	273	306	11	4%
Busselton Water	338	376	13	4%
Household Wastewater Bills				
Water Corporation, Perth	548	579	10	2%
Water Corporation, Country	553	632	26	5%
Total Household Water and Wastewater Bills				
Water Corporation, Perth	965	1,132	56	5%
Water Corporation, Country	1,053	1,230	59	5%
Commercial Water Bills				
Water Corporation, Perth	1,341	1,522	61	4%
Water Corporation, Country	8,678	7,775	-301	-4%
Aqwest, Bunbury	1,587	1,429	-53	-3%
Busselton Water	655	457	-66	-11%
Commercial Wastewater Bills				
Water Corporation, Perth	1,473	1,554	27	2%
Water Corporation, Country	1,105	1,153	16	1%
Total Commercial Water and Wastewater Bills				
Water Corporation, Perth	2,813	3,077	88	3%
Water Corporation, Country	9,783	8,928	-285	-3%

26.1 Impacts on Water Corporation Customers

Impacts on Metropolitan Residential Water Customers

All financial impacts are in real dollar values of 30 June 2009.

Table 26.1 Impacts on Metropolitan Residential Customers

	2010	2011	2012	2013
Water Payment				
50kL/annum	231	204	177	150
100kL/annum	267	251	235	220
150kL/annum	302	298	294	290
200kL/annum	345	357	369	381
250kL/annum	388	416	444	473
300kL/annum	431	475	520	564
350kL/annum	474	535	595	656
400kL/annum	524	598	673	747
450kL/annum	574	662	750	839
500kL/annum	623	726	828	930
550kL/annum	673	795	916	1,038
600kL/annum	748	881	1,013	1,145
650kL/annum	823	966	1,110	1,253
700kL/annum	898	1,052	1,206	1,360
750kL/annum	974	1,138	1,303	1,468
Water Payment Annual Variation				
50kL/annum		-27.20	-27.20	-27.20
100kL/annum		-15.69	-15.69	-15.69
150kL/annum		-4.17	-4.17	-4.17
200kL/annum		12.00	12.00	12.00
250kL/annum		28.18	28.18	28.18
300kL/annum		44.35	44.35	44.35
350kL/annum		60.52	60.52	60.52
400kL/annum		74.42	74.42	74.42
450kL/annum		88.31	88.31	88.31
500kL/annum		102.21	102.21	102.21
550kL/annum		121.44	121.44	121.44
600kL/annum		132.25	132.25	132.25
650kL/annum		143.06	143.06	143.06
700kL/annum		153.87	153.87	153.87
750kL/annum		164.69	164.69	164.69
Water Payment Annual Variation (%)				
50kL/annum		-11.77%	-13.33%	-15.39%
100kL/annum		-5.88%	-6.25%	-6.67%
150kL/annum		-1.38%	-1.40%	-1.42%
200kL/annum		3.48%	3.36%	3.25%
250kL/annum		7.26%	6.77%	6.34%
300kL/annum		10.29%	9.33%	8.53%
350kL/annum		12.77%	11.32%	10.17%
400kL/annum		14.21%	12.44%	11.06%
450kL/annum		15.40%	13.34%	11.77%
500kL/annum		16.39%	14.08%	12.35%
550kL/annum		18.04%	15.28%	13.26%
600kL/annum		17.67%	15.02%	13.06%
650kL/annum		17.37%	14.80%	12.89%
700kL/annum		17.13%	14.62%	12.76%
750kL/annum		16.92%	14.47%	12.64%

Table 26.2 Impacts on Metropolitan Pensioners (Real Dollars of June 2009)

	2010	2011	2012	2013
Water Payment				
50kL/annum	116	102	88	75
100kL/annum	133	125	118	110
150kL/annum	151	149	147	145
200kL/annum	194	208	222	236
250kL/annum	237	267	298	328
300kL/annum	182	248	314	380
350kL/annum	225	308	390	472
400kL/annum	276	372	468	564
450kL/annum	326	436	546	656
500kL/annum	375	499	623	747
550kL/annum	425	568	712	855
600kL/annum	500	654	808	962
650kL/annum	575	740	905	1,070
700kL/annum	651	826	1,002	1,177
750kL/annum	726	912	1,099	1,285
Water Payment Annual Variation				
50kL/annum		-14	-14	-14
100kL/annum		-8	-8	-8
150kL/annum		-2	-2	-2
200kL/annum		14	14	14
250kL/annum		30	30	30
300kL/annum		66	66	66
350kL/annum		82	82	82
400kL/annum		96	96	96
450kL/annum		110	110	110
500kL/annum		124	124	124
550kL/annum		143	143	143
600kL/annum		154	154	154
650kL/annum		165	165	165
700kL/annum		176	176	176
750kL/annum		187	187	187
Water Payment Annual Variation (%)				
50kL/annum		-11.8%	-13.3%	-15.4%
100kL/annum		-5.9%	-6.3%	-6.7%
150kL/annum		-1.4%	-1.4%	-1.4%
200kL/annum		7.3%	6.8%	6.3%
250kL/annum		12.8%	11.3%	10.2%
300kL/annum		36.1%	26.5%	21.0%
350kL/annum		36.4%	26.7%	21.1%
400kL/annum		34.9%	25.9%	20.5%
450kL/annum		33.8%	25.3%	20.2%
500kL/annum		33.0%	24.8%	19.9%
550kL/annum		33.7%	25.2%	20.1%
600kL/annum		30.8%	23.5%	19.0%
650kL/annum		28.6%	22.3%	18.2%
700kL/annum		27.0%	21.3%	17.5%
750kL/annum		25.7%	20.4%	17.0%

Table 26.3 Impacts on Metropolitan State Seniors (Real Dollars of June 2009)

	2010	2011	2012	2013
Water Payment				
50kL/annum	182	165	147	130
100kL/annum	218	212	206	200
150kL/annum	253	259	264	270
200kL/annum	296	318	340	361
250kL/annum	339	377	415	453
300kL/annum	235	318	401	485
350kL/annum	279	378	478	577
400kL/annum	329	442	556	669
450kL/annum	379	506	633	761
500kL/annum	429	570	711	852
550kL/annum	478	639	799	960
600kL/annum	554	725	896	1,067
650kL/annum	629	811	993	1,175
700kL/annum	704	897	1,089	1,282
750kL/annum	779	983	1,186	1,390
Water Payment Annual Variation				
50kL/annum		-18	-18	-18
100kL/annum		-6	-6	-6
150kL/annum		6	6	6
200kL/annum		22	22	22
250kL/annum		38	38	38
300kL/annum		83	83	83
350kL/annum		99	99	99
400kL/annum		113	113	113
450kL/annum		127	127	127
500kL/annum		141	141	141
550kL/annum		160	160	160
600kL/annum		171	171	171
650kL/annum		182	182	182
700kL/annum		193	193	193
750kL/annum		204	204	204
Water Payment Annual Variation (%)				
50kL/annum		-9.61%	-10.64%	-11.90%
100kL/annum		-2.76%	-2.84%	-2.92%
150kL/annum		2.17%	2.13%	2.08%
200kL/annum		7.32%	6.82%	6.39%
250kL/annum		11.16%	10.04%	9.13%
300kL/annum		35.30%	26.09%	20.69%
350kL/annum		35.65%	26.28%	20.81%
400kL/annum		34.49%	25.65%	20.41%
450kL/annum		33.62%	25.16%	20.10%
500kL/annum		32.96%	24.79%	19.86%
550kL/annum		33.55%	25.12%	20.08%
600kL/annum		30.93%	23.63%	19.11%
650kL/annum		28.96%	22.46%	18.34%
700kL/annum		27.41%	21.51%	17.70%
750kL/annum		26.17%	20.74%	17.18%

Table 26.4 Impacts on Metropolitan Dual Seniors (Real Dollars of June 2009)

	2010	2011	2012	2013
Water Payment				
50kL/annum	133	125	118	110
100kL/annum	169	172	176	180
150kL/annum	204	219	235	250
200kL/annum	247	279	310	341
250kL/annum	290	338	385	433
300kL/annum	235	318	401	485
350kL/annum	279	378	478	577
400kL/annum	329	442	556	669
450kL/annum	379	506	633	761
500kL/annum	429	570	711	852
550kL/annum	478	639	799	960
600kL/annum	554	725	896	1,067
650kL/annum	629	811	993	1,175
700kL/annum	704	897	1,089	1,282
750kL/annum	779	983	1,186	1,390
Water Payment Annual Variation				
50kL/annum		-8	-8	-8
100kL/annum		4	4	4
150kL/annum		15	15	15
200kL/annum		31	31	31
250kL/annum		48	48	48
300kL/annum		83	83	83
350kL/annum		99	99	99
400kL/annum		113	113	113
450kL/annum		127	127	127
500kL/annum		141	141	141
550kL/annum		160	160	160
600kL/annum		171	171	171
650kL/annum		182	182	182
700kL/annum		193	193	193
750kL/annum		204	204	204
Water Payment Annual Variation (%)				
50kL/annum		-5.88%	-6.25%	-6.67%
100kL/annum		2.17%	2.13%	2.08%
150kL/annum		7.44%	6.92%	6.47%
200kL/annum		12.69%	11.26%	10.12%
250kL/annum		16.38%	14.07%	12.34%
300kL/annum		35.30%	26.09%	20.69%
350kL/annum		35.65%	26.28%	20.81%
400kL/annum		34.49%	25.65%	20.41%
450kL/annum		33.62%	25.16%	20.10%
500kL/annum		32.96%	24.79%	19.86%
550kL/annum		33.55%	25.12%	20.08%
600kL/annum		30.93%	23.63%	19.11%
650kL/annum		28.96%	22.46%	18.34%
700kL/annum		27.41%	21.51%	17.70%
750kL/annum		26.17%	20.74%	17.18%

Table 26.5 Impacts on Metropolitan Tenants (Real Dollars of June 2009)

	2010	2011	2012	2013
Water Payment				
50kL/annum	35	47	58	70
100kL/annum	71	94	117	140
150kL/annum	106	141	175	210
200kL/annum	149	200	251	302
250kL/annum	192	259	326	393
300kL/annum	235	318	401	485
350kL/annum	279	378	478	577
400kL/annum	329	442	556	669
450kL/annum	379	506	633	761
500kL/annum	429	570	711	852
550kL/annum	478	639	799	960
600kL/annum	554	725	896	1,067
650kL/annum	629	811	993	1,175
700kL/annum	704	897	1,089	1,282
750kL/annum	779	983	1,186	1,390
Water Payment Annual Variation				
50kL/annum		12	12	12
100kL/annum		23	23	23
150kL/annum		35	35	35
200kL/annum		51	51	51
250kL/annum		67	67	67
300kL/annum		83	83	83
350kL/annum		99	99	99
400kL/annum		113	113	113
450kL/annum		127	127	127
500kL/annum		141	141	141
550kL/annum		160	160	160
600kL/annum		171	171	171
650kL/annum		182	182	182
700kL/annum		193	193	193
750kL/annum		204	204	204
Water Payment Annual Variation (%)				
50kL/annum		32.5%	24.5%	19.7%
100kL/annum		32.5%	24.5%	19.7%
150kL/annum		32.5%	24.5%	19.7%
200kL/annum		34.0%	25.4%	20.2%
250kL/annum		34.8%	25.8%	20.5%
300kL/annum		35.3%	26.1%	20.7%
350kL/annum		35.7%	26.3%	20.8%
400kL/annum		34.5%	25.6%	20.4%
450kL/annum		33.6%	25.2%	20.1%
500kL/annum		33.0%	24.8%	19.9%
550kL/annum		33.5%	25.1%	20.1%
600kL/annum		30.9%	23.6%	19.1%
650kL/annum		29.0%	22.5%	18.3%
700kL/annum		27.4%	21.5%	17.7%
750kL/annum		26.2%	20.7%	17.2%

Impacts on Metropolitan Non-Residential Water Customers

Table 26.6 Impacts on Metropolitan Non-Residential Water Customers (Real Dollars of June 2009)

	2010	2011	2012	2013
Water Payment				
20mm meter & 300kL	1,774	1,722	1,670	1,619
40mm meter & 2ML	9,058	9,039	9,089	9,141
100mm meter & 20ML	80,952	82,318	84,629	86,956
150mm meter & 50ML	199,075	203,217	209,763	216,348
200mm meter & 400ML	1,431,830	1,508,301	1,604,193	1,700,391
Vacant Land	994	970	946	922
Water Payment Annual Variation				
20mm meter &300kL		-52	-52	-52
40mm meter & 2ML		-18	50	52
100mm meter & 20ML		1,367	2,311	2,327
150mm meter & 50ML		4,142	6,546	6,585
200mm meter & 400ML		76,471	95,892	96,198
Vacant Land		-24	-24	-24
Water Payment Annual Variation (%)				
20mm meter &300kL		-2.9%	-3.0%	-3.1%
40mm meter &2ML		-0.2%	0.6%	0.6%
100mm meter &20ML		1.7%	2.8%	2.7%
150mm meter &50ML		2.1%	3.2%	3.1%
200mm meter &400ML		5.3%	6.4%	6.0%

Impacts on Metropolitan Non-residential Wastewater Customers

Table 26.7 Impacts on Metropolitan Non-Residential Wastewater Customers (Real Dollars of June 2009)

	2010	2011	2012	2013
Annual Payment				
1 Fixture & 250 kL	732	746	759	773
1 Fixture & 500 kL	1,301	1,324	1,349	1,373
2 Fixtures & 1000 kL	2,703	2,752	2,802	2,853
2 Fixtures & 5000 kL	11,798	12,013	12,231	12,453
3 Fixtures & 1000 kL	3,056	3,112	3,168	3,226
3 Fixtures & 5000 kL	12,152	12,373	12,598	12,827
4 Fixtures & 1000 kL	3,441	3,503	3,567	3,632
4 Fixtures & 5000 kL	12,536	12,764	12,996	13,233
Annual Payment Variation ($)				
1 Fixture & 250 kL		13	14	14
1 Fixture & 500 kL		24	24	25
2 Fixtures & 1000 kL		49	50	51
2 Fixtures & 5000 kL		215	218	222
3 Fixtures & 1000 kL		56	57	58
3 Fixtures & 5000 kL		221	225	229
4 Fixtures & 1000 kL		63	64	65
4 Fixtures & 5000 kL		228	232	236
Annual Payment Variation (%)				
1 Fixture & 250 kL		1.8%	1.8%	1.8%
1 Fixture & 500 kL		1.8%	1.8%	1.8%
2 Fixtures & 1000 kL		1.8%	1.8%	1.8%
2 Fixtures & 5000 kL		1.8%	1.8%	1.8%
3 Fixtures & 1000 kL		1.8%	1.8%	1.8%
3 Fixtures & 5000 kL		1.8%	1.8%	1.8%
4 Fixtures & 1000 kL		1.8%	1.8%	1.8%
4 Fixtures & 5000 kL		1.8%	1.8%	1.8%

26.2 Impacts on Aqwest Customers

Impacts on Aqwest's Residential Customers

Table 26.8 Impacts on Aqwest's Residential Customers (Real Dollars of June 2009)

	2010	2011	2012	2013
Water Payment				
Usage = 50 (kL per year)	123	117	112	108
Usage = 100	144	141	138	136
Usage = 150	165	164	164	164
Usage = 200	204	207	211	217
Usage = 250	243	250	259	269
Usage = 300	282	293	306	322
Usage = 350	321	336	354	374
Usage = 400	377	398	422	449
Usage = 450	432	459	489	524
Usage = 500	488	520	557	598
Usage = 550	562	602	647	697
Usage = 600	635	683	737	796
Usage = 650	709	765	826	895
Usage = 700	783	846	916	994
Usage = 750	871	943	1,024	1,102
Water Payment Annual Variation				
Usage = 50		-5	-5	-5
Usage = 100		-3	-3	-2
Usage = 150		-1	-0	1
Usage = 200		3	4	5
Usage = 250		7	9	10
Usage = 300		11	13	15
Usage = 350		15	18	20
Usage = 400		21	24	27
Usage = 450		27	30	34
Usage = 500		33	37	41
Usage = 550		40	45	50
Usage = 600		48	53	60
Usage = 650		55	62	69
Usage = 700		63	70	78
Usage = 750		72	80	78
Water Payment Annual Variation (%)				
Usage = 50		-4.2%	-4.2%	-4.2%
Usage = 100		-2.1%	-1.8%	-1.5%
Usage = 150		-0.5%	-0.1%	0.4%
Usage = 200		1.6%	2.1%	2.6%
Usage = 250		3.0%	3.5%	4.0%
Usage = 300		4.0%	4.5%	5.0%
Usage = 350		4.8%	5.2%	5.7%
Usage = 400		5.6%	6.0%	6.5%
Usage = 450		6.2%	6.6%	7.0%
Usage = 500		6.7%	7.0%	7.4%
Usage = 550		7.2%	7.5%	7.8%
Usage = 600		7.5%	7.8%	8.1%
Usage = 650		7.8%	8.1%	8.3%
Usage = 700		8.0%	8.3%	8.5%
Usage = 750		8.3%	8.5%	7.6%

Table 26.9 Impacts on Aqwest's Pensioner Customers (Real Dollars of June 2009)

	2010	2011	2012	2013
Water Payment				
Usage = 50 (kL/year)	61	59	56	54
Usage = 100	72	70	69	68
Usage = 150	82	82	82	82
Usage = 200	102	103	106	108
Usage = 250	121	125	129	135
Usage = 300	141	147	153	161
Usage = 350	160	168	177	187
Usage = 400	165	182	201	222
Usage = 450	221	244	269	297
Usage = 500	277	306	337	372
Usage = 550	352	388	428	472
Usage = 600	426	470	518	572
Usage = 650	499	551	608	671
Usage = 700	573	633	698	770
Usage = 750	663	730	805	877
Water Payment Annual Variation				
Usage = 50		-3	-2	-2
Usage = 100		-1	-1	-1
Usage = 150		-0	-0	0
Usage = 200		2	2	3
Usage = 250		4	4	5
Usage = 300		6	7	8
Usage = 350		8	9	10
Usage = 400		17	19	21
Usage = 450		23	25	28
Usage = 500		29	32	35
Usage = 550		36	40	44
Usage = 600		44	48	53
Usage = 650		52	57	63
Usage = 700		59	65	72
Usage = 750		68	75	72
Water Payment Annual Variation (%)				
Usage = 50		-4.2%	-4.2%	-4.2%
Usage = 100		-2.1%	-1.8%	-1.5%
Usage = 150		-0.5%	-0.1%	0.4%
Usage = 200		1.6%	2.1%	2.6%
Usage = 250		3.0%	3.5%	4.0%
Usage = 300		4.0%	4.5%	5.0%
Usage = 350		4.8%	5.2%	5.7%
Usage = 400		10.3%	10.3%	10.3%
Usage = 450		10.3%	10.3%	10.3%
Usage = 500		10.3%	10.3%	10.3%
Usage = 550		10.3%	10.3%	10.3%
Usage = 600		10.3%	10.3%	10.3%
Usage = 650		10.3%	10.3%	10.3%
Usage = 700		10.3%	10.3%	10.3%
Usage = 750		10.2%	10.3%	8.9%

Impacts on Aqwest's Non-residential Customers

Table 26.10 Impacts on Aqwest's Non-Residential Customers (Real Dollars of June 2009)

	2010	2011	2012	2013
Water Payment				
Meter = 20mm, Usage = 250kL	580	538	496	453
Meter = 25mm, Usage = 1000kL	1,394	1,470	1,545	1,620
Meter = 40mm, Usage = 2ML	3,505	3,438	3,373	3,309
Meter = 50mm, Usage = 5ML	7,907	7,927	7,950	7,973
Meter = 80mm, Usage = 10ML	17,528	17,086	16,656	16,225
Meter = 100mm, Usage = 20ML	32,772	32,468	32,180	31,893
Meter = 150mm, Usage = 50ML	80,124	79,802	79,518	79,235
Water Payment Annual Variation				
Meter = 20mm, Usage = 250kL		-42	-42	-42
Meter = 25mm, Usage = 1000kL		76	75	75
Meter = 40mm, Usage = 2ML		-67	-65	-65
Meter = 50mm, Usage = 5ML		20	23	23
Meter = 80mm, Usage = 10ML		-441	-431	-431
Meter = 100mm, Usage = 20ML		-304	-288	-288
Meter = 150mm, Usage = 50ML		-322	-284	-284
Water Payment Annual Variation (%)				
Meter = 20mm, Usage = 250kL		-7.3%	-7.9%	-8.5%
Meter = 25mm, Usage = 1000kL		5.4%	5.1%	4.9%
Meter = 40mm, Usage = 2ML		-1.9%	-1.9%	-1.9%
Meter = 50mm, Usage = 5ML		0.2%	0.3%	0.3%
Meter = 80mm, Usage = 10ML		-2.5%	-2.5%	-2.6%
Meter = 100mm, Usage = 20ML		-0.9%	-0.9%	-0.9%
Meter = 150mm, Usage = 50ML		-0.4%	-0.4%	-0.4%

26.3 Impacts on Busselton Water Customers

Impacts on Busselton Water's Residential Customers

Table 26.11 Impacts on Busselton Water's Residential Customers (Real Dollars of June 2009)

	2010	2011	2012	2013
Water Payment				
Usage = 50 kL per year	161	147	134	122
Usage = 100	188	179	171	165
Usage = 150	215	210	208	208
Usage = 200	252	254	259	268
Usage = 250	290	298	310	328
Usage = 300	328	342	362	388
Usage = 350	365	386	413	447
Usage = 400	407	434	469	514
Usage = 450	448	483	526	580
Usage = 500	490	531	583	646
Usage = 550	531	580	639	712
Usage = 600	581	638	707	791
Usage = 650	631	696	775	870
Usage = 700	681	754	843	950
Usage = 750	731	812	911	1,029
Water Payment Annual Variation				
Usage = 50		-14	-13	-12
Usage = 100		-9	-8	-6
Usage = 150		-5	-2	0
Usage = 200		2	5	9
Usage = 250		8	12	17
Usage = 300		14	20	26
Usage = 350		21	27	35
Usage = 400		27	35	44
Usage = 450		34	43	54
Usage = 500		41	51	63
Usage = 550		48	60	73
Usage = 600		57	69	84
Usage = 650		65	79	95
Usage = 700		73	89	107
Usage = 750		82	99	118
Water Payment Annual Variation (%)				
Usage = 50		-8.5%	-8.8%	-9.0%
Usage = 100		-4.9%	-4.3%	-3.5%
Usage = 150		-2.2%	-1.2%	0.1%
Usage = 200		0.6%	1.9%	3.4%
Usage = 250		2.7%	4.1%	5.6%
Usage = 300		4.3%	5.7%	7.2%
Usage = 350		5.6%	7.0%	8.4%
Usage = 400		6.8%	8.1%	9.4%
Usage = 450		7.7%	9.0%	10.2%
Usage = 500		8.5%	9.7%	10.8%
Usage = 550		9.1%	10.3%	11.4%
Usage = 600		9.8%	10.9%	11.9%
Usage = 650		10.3%	11.4%	12.3%
Usage = 700		10.8%	11.8%	12.7%
Usage = 750		11.2%	12.1%	13.0%

Table 26.12 Impacts on Busselton Water's Pensioners Customers (Real Dollars of June 2009)

	2010	2011	2012	2013
Water Payment				
Usage = 50 kL/year	81	74	67	61
Usage = 100	94	89	86	83
Usage = 150	107	105	104	104
Usage = 200	126	127	129	134
Usage = 250	145	149	155	164
Usage = 300	164	171	181	194
Usage = 350	183	193	206	224
Water Payment Annual Variation				
Usage = 50		-7	-6	-6
Usage = 100		-5	-4	-3
Usage = 150		-2	-1	0
Usage = 200		1	2	4
Usage = 250		4	6	9
Usage = 300		7	10	13
Usage = 350		10	14	17
Water Payment Annual Variation (%)				
Usage = 50		-8.5%	-8.8%	-9.0%
Usage = 100		-4.9%	-4.3%	-3.5%
Usage = 150		-2.2%	-1.2%	0.1%
Usage = 200		0.6%	1.9%	3.4%
Usage = 250		2.7%	4.1%	5.6%
Usage = 300		4.3%	5.7%	7.2%
Usage = 350		5.6%	7.0%	8.4%

Impacts on Busselton Water's Non-Residential Customers

Table 26.13 Impacts on Busselton Water's Non-Residential Customers (Real Dollars of June 2009)

	2010	2011	2012	2013
Water Payment				
Meter = 20mm, Usage = 250kL	672	584	497	410
Meter = 25mm, Usage = 1000kL	1,638	1,575	1,510	1,446
Meter = 40mm, Usage = 2ML	4,055	3,690	3,326	2,962
Meter = 50mm, Usage = 5ML	9,124	8,451	7,779	7,107
Meter = 80mm, Usage = 10ML	20,157	18,266	16,379	14,493
Meter = 100mm, Usage = 20ML	37,703	34,607	31,518	28,429
Meter = 150mm, Usage = 50ML	92,062	84,960	77,768	70,576
Water Payment Annual Variation				
Meter = 20mm, Usage = 250kL		-87	-87	-87
Meter = 25mm, Usage = 1000kL		-63	-64	-64
Meter = 40mm, Usage = 2ML		-365	-364	-364
Meter = 50mm, Usage = 5ML		-673	-672	-672
Meter = 80mm, Usage = 10ML		-1,891	-1,886	-1,886
Meter = 100mm, Usage = 20ML		-3,096	-3,089	-3,089
Meter = 150mm, Usage = 50ML		-7,102	-7,192	-7,192
Water Payment Annual Variation (%)				
Meter = 20mm, Usage = 250kL		-13.0%	-14.9%	-17.5%
Meter = 25mm, Usage = 1000kL		-3.9%	-4.1%	-4.2%
Meter = 40mm, Usage = 2ML		-9.0%	-9.9%	-10.9%
Meter = 50mm, Usage = 5ML		-7.4%	-8.0%	-8.6%
Meter = 80mm, Usage = 10ML		-9.4%	-10.3%	-11.5%
Meter = 100mm, Usage = 20ML		-8.2%	-8.9%	-9.8%
Meter = 150mm, Usage = 50ML		-7.7%	-8.5%	-9.2%

27 Appendix K. Additional Impact Assessments

Sample Residential Impact Examples

The following tables show the impacts of the Authority's recommendations on residential customers in selected suburbs in Perth.

All dollars are in real value of June 2009.

Suburb	GRV ($)		Cons.(kL)	
Cottesloe	24,274		723	
	Average Annual Payment			
	2008/09	2012/13	Increase $	Increase %
Water service	180.50	79.59	-100.91	-55.9%
Water consumption	707.63	1,329.95	622.32	87.9%
Sewerage	781.35	578.95	-202.40	-25.9%
Drainage	-	-	-	
Total	1,669.48	1,988.49	319.01	19.1%

Suburb	GRV ($)		Cons.(kL)	
Melville	12,132		464	
	Average Annual Payment			
	2008/09	2012/13	Increase $	Increase %
Water service	180.50	79.59	-100.91	-55.9%
Water consumption	375.71	784.62	408.91	108.8%
Sewerage	584.65	578.95	-5.70	-1.0%
Drainage	-	-	-	
Total	1,140.86	1,443.16	302.30	26.5%

Suburb	GRV ($)		Cons.(kL)	
Clarkson	10,366		231	
	Average Annual Payment			
	2008/09	2012/13	Increase $	Increase %
Water service	180.50	79.59	-100.91	-55.9%
Water consumption	163.52	358.23	194.71	119.1%
Sewerage	492.40	578.95	86.55	17.6%
Drainage	-	-	-	
Total	836.42	1,016.77	180.35	21.6%

Suburb	GRV ($)		Cons.(kL)	
Nedlands	22,486		408	
	Average Annual Payment			
	2008/09	2012/13	Increase $	Increase %
Water service	180.50	79.59	-100.91	-55.9%
Water consumption	319.88	682.14	362.26	113.3%
Sewerage	752.40	578.95	-173.45	-23.1%
Drainage	77.00	87.21	10.21	13.3%
Total	1,329.78	1,427.89	98.11	7.4%

Suburb	GRV ($)		Cons.(kL)	
Safety Bay	8,676		187	
	Average Annual Payment			
	2008/09	2012/13	Increase $	Increase %
Water service	180.50	79.59	-100.91	-55.9%
Water consumption	127.09	277.71	150.62	118.5%
Sewerage	412.10	578.95	166.85	40.5%
Drainage	59.60	87.21	27.61	46.3%
Total	779.29	1,023.46	244.17	31.3%

Suburb	GRV ($)		Cons.(kL)	
Bayswater	11,415		572	
	Average Annual Payment			
	2008/09	2012/13	Increase $	Increase %
Water service	180.50	79.59	-100.91	-55.9%
Water consumption	492.76	1,005.30	512.54	104.0%
Sewerage	573.05	578.95	5.90	1.0%
Drainage	70.60	87.21	16.61	23.5%
Total	1,316.91	1,751.05	434.14	33.0%

Suburb	GRV ($)		Cons.(kL)	
Westminster	8,779		312	
	Average Annual Payment			
	2008/09	2012/13	Increase $	Increase %
Water service	180.50	79.59	-100.91	-55.9%
Water consumption	230.59	506.46	275.87	119.6%
Sewerage	413.60	578.95	165.35	40.0%
Drainage	59.60	87.21	27.61	46.3%
Total	884.29	1,252.21	367.92	41.6%

Sample Commercial Impact Examples

All dollars are in real value of June 2009.

Industry	Fixture	Meter Size	Cons. (kL)	Discharge
Shopping Centre	33	50	8,097	83%
	Average Annual Payment			
	2008/09	2012/13	Increase $	Increase %
Water Service	2,001.00	318.36	-1,682.64	-84.1%
Water Consumption	8,409.17	14,817.51	6,408.34	76.2%
Sewerage Service	12,549.60	13,483.04	933.44	7.4%
Sewerage Volumetric	14,488.95	15,566.70	1,077.75	7.4%
Drainage	-	-	-	
Total	35,447.72	43,867.25	8,419.53	23.8%

Industry	Fixture	Meter Size	Cons. (kL)	Discharge
Accommodation	17	50	4,896	93%
	Average Annual Payment			
	2008/09	2012/13	Increase $	Increase %
Water Service	3,127.00	2,899.00	-228.00	-7.3%
Water Consumption	5,070.53	5,943.72	873.19	17.2%
Sewerage Service	6,504.80	6,988.55	483.75	7.4%
Sewerage Volumetric	9,692.60	10,413.58	720.98	7.4%
Drainage	-	-	-	
Total	21,267.93	23,345.85	2,077.92	9.8%

Industry	Fixture	Meter Size	Cons. (kL)	Discharge
Hotel	50	80	3,734	90%
	Average Annual Payment			
	2008/09	2012/13	Increase $	Increase %
Water Service	8,005.00	7,422.00	-583.00	-7.3%
Water Consumption	3,858.56	4,526.08	667.52	17.3%
Sewerage Service	18,972.20	20,383.44	1,411.24	7.4%
Sewerage Volumetric	7,101.71	7,629.96	528.26	7.4%
Drainage	1,649.55	436.04	-1,213.51	-73.6%
Total	31,582.02	32,975.52	1,393.50	4.4%

Industry	Fixture	Meter Size	Cons. (kL)	Discharge
Restaurant	9	20	913	94%
	Average Annual Payment			
	2008/09	2012/13	Increase $	Increase %
Water Service	500.30	463.80	-36.50	-7.3%
Water Consumption	916.26	1,084.46	168.20	18.4%
Sewerage Service	3,482.40	3,741.30	258.90	7.4%
Sewerage Volumetric	1,462.29	1,571.06	108.77	7.4%
Drainage	-	-	-	
Total	5,860.95	6,396.82	535.88	9.1%

Industry	Fixture	Meter Size	Cons. (kL)	Discharge
Office	2	20	799	93%
	Average Annual Payment			
	2008/09	2012/13	Increase $	Increase %
Water Service	500.30	463.80	-36.50	-7.3%
Water Consumption	797.36	945.38	148.02	18.6%
Sewerage Service	868.10	932.54	64.44	7.4%
Sewerage Volumetric	1,219.10	1,309.78	90.68	7.4%
Drainage	-	-	-	
Total	2,884.56	3,187.71	303.15	10.5%

Industry	Fixture	Meter Size	Cons. (kL)	Discharge
Hospital	27	50	364	58%
	Average Annual Payment			
	2008/09	2012/13	Increase $	Increase %
Water Service	3,127.00	2,899.00	-228.00	-7.3%
Water Consumption	357.81	426.24	68.43	19.1%
Sewerage Service	10,282.80	11,047.61	764.81	7.4%
Sewerage Volumetric	23.43	25.17	1.74	7.4%
Drainage	1,492.80	436.04	-1,056.76	-70.8%
Total	12,156.84	11,935.06	-221.78	-1.8%

Industry	Fixture	Meter Size	Cons. (kL)	Discharge
Industrial	4	20	388	90%
	Average Annual Payment			
	2008/09	2012/13	Increase $	Increase %
Water Service	500.30	463.80	-36.50	-7.3%
Water Consumption	381.40	454.35	72.94	19.1%
Sewerage Service	1,593.40	1,711.77	118.37	7.4%
Sewerage Volumetric	330.54	355.13	24.59	7.4%
Drainage	63.10	87.21	24.11	38.2%
Total	2,368.44	2,608.46	240.01	10.1%

Industry	Fixture	Meter Size	Cons. (kL)	Discharge
Shop	1	20	198	90%
	Average Annual Payment			
	2008/09	2012/13	Increase $	Increase %
Water Service	500.30	463.80	-36.50	-7.3%
Water Consumption	194.63	231.86	37.22	19.1%
Sewerage Service	607.90	653.04	45.14	7.4%
Sewerage Volumetric	- 50.12	- 53.84	-3.73	7.4%
Drainage	-	-	-	
Total	752.42	831.05	78.63	10.5%

28 Appendix L. Impacts on Country Customers

28.1 Impacts on Country Water Customers

The following table shows the impacts of the Authority's recommended tariffs on typical water customers in country towns, where typical customers are defined as follows:

- for towns in Region A (south) – water usage of 250 kL per year; and
- for towns in Region B (north) – water usage of 350 kL per year.

Table 28.1 Average Water Bills for Country Town Customers (Dollar Values in Real Dollars of June 2009)

Name of Town	Current Class	Proposed Class	Current Annual Water Bill 2009/10 (250 kL for South, 350 kL for North)	Annual Water Bill in 2013/14 (250 kL for South, 350 kL for North)	Variation in Annual Water Bill Between 2009/10 – 2013/14		Average Annual Variation in Water Bill
					($)	(%)	(%)
Albany	1	3	388.06	508.86	120.79	31.1%	5.6%
Allanooka Farmland	1	2	388.06	508.86	120.79	31.1%	5.6%
Allanson	2	4	388.06	508.86	120.79	31.1%	5.6%
Arino	5	5	388.06	508.86	120.79	31.1%	5.6%
Arrowsmith Farmland	3	5	388.06	508.86	120.79	31.1%	5.6%
Augusta	3	5	388.06	508.86	120.79	31.1%	5.6%
Australind/Eaton	1	3	388.06	508.86	120.79	31.1%	5.6%
Badgingarra	5	5	388.06	508.86	120.79	31.1%	5.6%
Bakers Hill	2	4	388.06	508.86	120.79	31.1%	5.6%
Balingup	3	5	388.06	508.86	120.79	31.1%	5.6%
Ballidu	4	5	388.06	508.86	120.79	31.1%	5.6%
Beacon	5	5	388.06	508.86	120.79	31.1%	5.6%
Bencubbin	5	5	388.06	508.86	120.79	31.1%	5.6%
Beverley	2	5	388.06	508.86	120.79	31.1%	5.6%
Bindi Bindi	5	5	388.06	508.86	120.79	31.1%	5.6%
Binningup	2	5	388.06	508.86	120.79	31.1%	5.6%
Bodallin	2	5	388.06	508.86	120.79	31.1%	5.6%
Boddington	2	5	388.06	508.86	120.79	31.1%	5.6%

Name of Town	Current Class	Proposed Class	Current Annual Water Bill 2009/10 (250 kL for South, 350 kL for North)	Annual Water Bill in 2013/14 (250 kL for South, 350 kL for North)	Variation in Annual Water Bill Between 2009/10 – 2013/14		Average Annual Variation in Water Bill
					($)	(%)	(%)
Bolgart	4	5	388.06	508.86	120.79	31.1%	5.6%
Borden	5	5	388.06	508.86	120.79	31.1%	5.6%
Boyanup	1	3	388.06	508.86	120.79	31.1%	5.6%
Boyup Brook	2	5	388.06	508.86	120.79	31.1%	5.6%
Bremer Bay	3	5	388.06	508.86	120.79	31.1%	5.6%
Bridgetown	3	5	388.06	508.86	120.79	31.1%	5.6%
Broad Arrow	5	5	388.06	508.86	120.79	31.1%	5.6%
Brookton	3	5	388.06	508.86	120.79	31.1%	5.6%
Broome	1	2	443.93	605.86	161.92	36.5%	6.4%
Broomehill	3	5	388.06	508.86	120.79	31.1%	5.6%
Bruce Rock	4	5	388.06	508.86	120.79	31.1%	5.6%
Brunswick/Burekup/Roelands	2	3	388.06	508.86	120.79	31.1%	5.6%
Bullaring	3	5	388.06	508.86	120.79	31.1%	5.6%
Bullfinch	5	5	388.06	508.86	120.79	31.1%	5.6%
Bunjil	4	5	388.06	508.86	120.79	31.1%	5.6%
Buntine	5	1	388.06	468.56	80.50	20.7%	3.8%
Burracoppin	2	5	388.06	508.86	120.79	31.1%	5.6%
Burrup Ext	2	4	443.93	605.86	161.92	36.5%	6.4%
Calingari	3	5	388.06	508.86	120.79	31.1%	5.6%
Camballin	4	5	443.93	605.86	161.92	36.5%	6.4%
Capel	1	3	388.06	508.86	120.79	31.1%	5.6%
Carnamah	2	5	388.06	508.86	120.79	31.1%	5.6%
Carnarvon Town	2	5	443.93	605.86	161.92	36.5%	6.4%
Caron	4	4	388.06	508.86	120.79	31.1%	5.6%
Cervantes	1	4	388.06	508.86	120.79	31.1%	5.6%
Chittering/Bindoon	3	5	388.06	508.86	120.79	31.1%	5.6%
Collie	1	3	388.06	508.86	120.79	31.1%	5.6%
Collie F/L	1	1	388.06	468.56	80.50	20.7%	3.8%
Condingup	4	5	388.06	508.86	120.79	31.1%	5.6%

Name of Town	Current Class	Proposed Class	Current Annual Water Bill 2009/10 (250 kL for South, 350 kL for North)	Annual Water Bill in 2013/14 (250 kL for South, 350 kL for North)	Variation in Annual Water Bill Between 2009/10 – 2013/14		Average Annual Variation in Water Bill
					($)	(%)	(%)
Coolgardie	3	5	388.06	508.86	120.79	31.1%	5.6%
Coomberdale	5	5	388.06	508.86	120.79	31.1%	5.6%
Coorow	2	5	388.06	508.86	120.79	31.1%	5.6%
Corrigin	4	5	388.06	508.86	120.79	31.1%	5.6%
Cowaramup	4	5	388.06	508.86	120.79	31.1%	5.6%
Cranbrook	4	5	388.06	508.86	120.79	31.1%	5.6%
Cuballing	3	5	388.06	508.86	120.79	31.1%	5.6%
Cue	3	5	443.93	605.86	161.92	36.5%	6.4%
Cunderdin	1	2	388.06	508.86	120.79	31.1%	5.6%
Dalwallinu	3	5	388.06	508.86	120.79	31.1%	5.6%
Dalyellup	2	3	388.06	508.86	120.79	31.1%	5.6%
Dandaragan	4	5	388.06	508.86	120.79	31.1%	5.6%
Dardanup	3	5	388.06	508.86	120.79	31.1%	5.6%
Darkan	2	5	388.06	508.86	120.79	31.1%	5.6%
Dathagnoorara	1	4	388.06	508.86	120.79	31.1%	5.6%
Denham Saline	3	4	443.93	605.86	161.92	36.5%	6.4%
Denmark	4	5	388.06	508.86	120.79	31.1%	5.6%
Derby	2	3	443.93	605.86	161.92	36.5%	6.4%
Dongara/Deniso	1	2	388.06	508.86	120.79	31.1%	5.6%
Donnybrook	1	3	388.06	508.86	120.79	31.1%	5.6%
Doodlakine	3	5	388.06	508.86	120.79	31.1%	5.6%
Dowerin	2	5	388.06	508.86	120.79	31.1%	5.6%
Dumbleyung	5	5	388.06	508.86	120.79	31.1%	5.6%
Dundinin/Harrismith/Jitarning	5	5	388.06	508.86	120.79	31.1%	5.6%
Dunsborough/Yallingup	2	1	388.06	468.56	80.50	20.7%	3.8%
Dwellingup	3	5	388.06	508.86	120.79	31.1%	5.6%
Eneabba	2	5	388.06	508.86	120.79	31.1%	5.6%
Eradu	3	5	388.06	508.86	120.79	31.1%	5.6%
Esperance	1	3	388.06	508.86	120.79	31.1%	5.6%

Name of Town	Current Class	Proposed Class	Current Annual Water Bill 2009/10 (250 kL for South, 350 kL for North)	Annual Water Bill in 2013/14 (250 kL for South, 350 kL for North)	Variation in Annual Water Bill Between 2009/10 – 2013/14		Average Annual Variation in Water Bill
					($)	(%)	(%)
Exmouth	2	4	443.93	605.86	161.92	36.5%	6.4%
Fitzroy Crossing	2	3	443.93	605.86	161.92	36.5%	6.4%
Frankland	4	5	388.06	508.86	120.79	31.1%	5.6%
Gabbadah (Sovereign Hill)	2	5	388.06	508.86	120.79	31.1%	5.6%
Gascoyne Junction	4	5	443.93	605.86	161.92	36.5%	6.4%
Geraldton	1	2	388.06	508.86	120.79	31.1%	5.6%
Gibson	4	5	388.06	508.86	120.79	31.1%	5.6%
Gin Gin	2	5	388.06	508.86	120.79	31.1%	5.6%
Gnarabup	1	5	388.06	508.86	120.79	31.1%	5.6%
Gnowangerup	4	5	388.06	508.86	120.79	31.1%	5.6%
Goomaling	3	5	388.06	508.86	120.79	31.1%	5.6%
Grass Patch	5	5	388.06	508.86	120.79	31.1%	5.6%
Grass Valley	2	1	388.06	468.56	80.50	20.7%	3.8%
Greenbushes	3	5	388.06	508.86	120.79	31.1%	5.6%
Greenhead	2	4	388.06	508.86	120.79	31.1%	5.6%
Guilderton	2	4	388.06	508.86	120.79	31.1%	5.6%
Halls Creek	3	5	443.93	605.86	161.92	36.5%	6.4%
Harvey/Wokalup	1	4	388.06	508.86	120.79	31.1%	5.6%
Highbury & Piessville	3	5	388.06	508.86	120.79	31.1%	5.6%
Hines Hill	3	5	388.06	508.86	120.79	31.1%	5.6%
Hopetoun	3	5	388.06	508.86	120.79	31.1%	5.6%
Horrocks	4	5	388.06	508.86	120.79	31.1%	5.6%
Hyden	4	5	388.06	508.86	120.79	31.1%	5.6%
Jerramungup	4	5	388.06	508.86	120.79	31.1%	5.6%
Jurien	1	3	388.06	508.86	120.79	31.1%	5.6%
Kalannie	4	5	388.06	508.86	120.79	31.1%	5.6%
Kalbarri	1	3	388.06	508.86	120.79	31.1%	5.6%
Kalgarin	5	5	388.06	508.86	120.79	31.1%	5.6%
Kalgoorlie/Boulder	3	5	388.06	508.86	120.79	31.1%	5.6%

Name of Town	Current Class	Proposed Class	Current Annual Water Bill 2009/10 (250 kL for South, 350 kL for North)	Annual Water Bill in 2013/14 (250 kL for South, 350 kL for North)	Variation in Annual Water Bill Between 2009/10 – 2013/14		Average Annual Variation in Water Bill
					($)	(%)	(%)
Kambalda	3	3	388.06	508.86	120.79	31.1%	5.6%
Karakin (Seaview)	2	5	388.06	508.86	120.79	31.1%	5.6%
Karratha	2	4	443.93	605.86	161.92	36.5%	6.4%
Katanning	3	5	388.06	508.86	120.79	31.1%	5.6%
Katanning Farmland	3	5	388.06	508.86	120.79	31.1%	5.6%
Kellerberrin	3	5	388.06	508.86	120.79	31.1%	5.6%
Kendenup Farmland	3	5	388.06	508.86	120.79	31.1%	5.6%
Kendenup Town	4	5	388.06	508.86	120.79	31.1%	5.6%
Kirup	4	5	388.06	508.86	120.79	31.1%	5.6%
Kojonup/Muradup	3	5	388.06	508.86	120.79	31.1%	5.6%
Kondinin	4	5	388.06	508.86	120.79	31.1%	5.6%
Koorda	3	5	388.06	508.86	120.79	31.1%	5.6%
Kukerin & Moulyinning	5	5	388.06	508.86	120.79	31.1%	5.6%
Kulin	4	5	388.06	508.86	120.79	31.1%	5.6%
Kununoppin	4	5	388.06	508.86	120.79	31.1%	5.6%
Kununurra	1	3	443.93	605.86	161.92	36.5%	6.4%
Lake Argyle	4	5	443.93	605.86	161.92	36.5%	6.4%
Lake Grace	4	5	388.06	508.86	120.79	31.1%	5.6%
Lake King	5	5	388.06	508.86	120.79	31.1%	5.6%
Lancelin	2	5	388.06	508.86	120.79	31.1%	5.6%
Latham	4	5	388.06	508.86	120.79	31.1%	5.6%
Laverton	3	5	443.93	605.86	161.92	36.5%	6.4%
Ledge Point	2	4	388.06	508.86	120.79	31.1%	5.6%
Leeman	2	5	388.06	508.86	120.79	31.1%	5.6%
Leonora	3	5	443.93	605.86	161.92	36.5%	6.4%
Mandurah	1	3	388.06	508.86	120.79	31.1%	5.6%
Manjimup	2	5	388.06	508.86	120.79	31.1%	5.6%
Marble Bar	4	5	443.93	605.86	161.92	36.5%	6.4%

Name of Town	Current Class	Proposed Class	Current Annual Water Bill 2009/10 (250 kL for South, 350 kL for North)	Annual Water Bill in 2013/14 (250 kL for South, 350 kL for North)	Variation in Annual Water Bill Between 2009/10 – 2013/14		Average Annual Variation in Water Bill
					($)	(%)	(%)
Margaret River	1	3	388.06	508.86	120.79	31.1%	5.6%
Marvel Loch	4	5	388.06	508.86	120.79	31.1%	5.6%
Meckering	2	5	388.06	508.86	120.79	31.1%	5.6%
Meekatharra	3	4	443.93	605.86	161.92	36.5%	6.4%
Menzies	5	5	443.93	605.86	161.92	36.5%	6.4%
Merredin	2	4	388.06	508.86	120.79	31.1%	5.6%
Merredin Farmlands	4	2	388.06	508.86	120.79	31.1%	5.6%
Miling	3	5	388.06	508.86	120.79	31.1%	5.6%
Mingenew	2	5	388.06	508.86	120.79	31.1%	5.6%
Moora	1	3	388.06	508.86	120.79	31.1%	5.6%
Moora/Round Hill	1	1	388.06	468.56	80.50	20.7%	3.8%
Moorine Rock	5	5	388.06	508.86	120.79	31.1%	5.6%
Morowa	3	5	388.06	508.86	120.79	31.1%	5.6%
Mount Barker	3	5	388.06	508.86	120.79	31.1%	5.6%
Mount Magnet	2	5	443.93	605.86	161.92	36.5%	6.4%
Mount Roe	5	5	388.06	508.86	120.79	31.1%	5.6%
Mukinbudin	4	5	388.06	508.86	120.79	31.1%	5.6%
Mullayup	5	5	388.06	508.86	120.79	31.1%	5.6%
Mullewa Farmland	3	4	388.06	508.86	120.79	31.1%	5.6%
Mullewa Town	4	5	388.06	508.86	120.79	31.1%	5.6%
Mullewa/Mingenew	4	5	388.06	508.86	120.79	31.1%	5.6%
Munglinup	5	5	388.06	508.86	120.79	31.1%	5.6%
Muntadgin	5	5	388.06	508.86	120.79	31.1%	5.6%
Myalup	3	5	388.06	508.86	120.79	31.1%	5.6%
Nabawa	3	5	388.06	508.86	120.79	31.1%	5.6%
Nannup	3	5	388.06	508.86	120.79	31.1%	5.6%
Narembeen	4	5	388.06	508.86	120.79	31.1%	5.6%
Narngulu	1	1	388.06	468.56	80.50	20.7%	3.8%
Narrikup	3	5	388.06	508.86	120.79	31.1%	5.6%

Name of Town	Current Class	Proposed Class	Current Annual Water Bill 2009/10 (250 kL for South, 350 kL for North)	Annual Water Bill in 2013/14 (250 kL for South, 350 kL for North)	Variation in Annual Water Bill Between 2009/10 – 2013/14		Average Annual Variation in Water Bill
					($)	(%)	(%)
Narrogin	2	5	388.06	508.86	120.79	31.1%	5.6%
Narrogin Farmland	4	3	388.06	508.86	120.79	31.1%	5.6%
New Norcia	4	5	388.06	508.86	120.79	31.1%	5.6%
Newdegate	4	5	388.06	508.86	120.79	31.1%	5.6%
Newman	2	2	443.93	605.86	161.92	36.5%	6.4%
Nilgen Ocean Farms	2	5	388.06	508.86	120.79	31.1%	5.6%
Norseman	4	5	388.06	508.86	120.79	31.1%	5.6%
North Dandalup	2	4	388.06	508.86	120.79	31.1%	5.6%
Northam	1	4	388.06	508.86	120.79	31.1%	5.6%
Northam Farmlands	4	2	388.06	508.86	120.79	31.1%	5.6%
Northcliffe	4	5	388.06	508.86	120.79	31.1%	5.6%
Northhampton	3	5	388.06	508.86	120.79	31.1%	5.6%
Nullagine	4	5	443.93	605.86	161.92	36.5%	6.4%
Nungarin	4	5	388.06	508.86	120.79	31.1%	5.6%
Nyabing	4	5	388.06	508.86	120.79	31.1%	5.6%
Ongerup	5	5	388.06	508.86	120.79	31.1%	5.6%
Onslow	4	5	443.93	605.86	161.92	36.5%	6.4%
Ora Banda UD Extension	5	5	388.06	508.86	120.79	31.1%	5.6%
Parkridge	1	3	388.06	508.86	120.79	31.1%	5.6%
Pemberton	3	5	388.06	508.86	120.79	31.1%	5.6%
Peppermint Grove	3	5	388.06	508.86	120.79	31.1%	5.6%
Perenjori	4	5	388.06	508.86	120.79	31.1%	5.6%
Pingaring	5	5	388.06	508.86	120.79	31.1%	5.6%
Pingelly	3	5	388.06	508.86	120.79	31.1%	5.6%
Pingrup	5	5	388.06	508.86	120.79	31.1%	5.6%
Pinjarra	1	3	388.06	508.86	120.79	31.1%	5.6%
Pithara	3	5	388.06	508.86	120.79	31.1%	5.6%
Popanyinning	4	5	388.06	508.86	120.79	31.1%	5.6%

Name of Town	Current Class	Proposed Class	Current Annual Water Bill 2009/10 (250 kL for South, 350 kL for North)	Annual Water Bill in 2013/14 (250 kL for South, 350 kL for North)	Variation in Annual Water Bill Between 2009/10 – 2013/14		Average Annual Variation in Water Bill
					($)	(%)	(%)
Porongorup Town	1	5	388.06	508.86	120.79	31.1%	5.6%
Port Hedland	1	3	443.93	605.86	161.92	36.5%	6.4%
Quairading	3	5	388.06	508.86	120.79	31.1%	5.6%
Quinninup	5	5	388.06	508.86	120.79	31.1%	5.6%
Ravensthorpe	5	5	388.06	508.86	120.79	31.1%	5.6%
Rocky Gully	5	5	388.06	508.86	120.79	31.1%	5.6%
Roebourne	3	5	443.93	605.86	161.92	36.5%	6.4%
Salmon Gums	5	5	388.06	508.86	120.79	31.1%	5.6%
Sandstone	4	5	443.93	605.86	161.92	36.5%	6.4%
Sea Bird	3	5	388.06	508.86	120.79	31.1%	5.6%
Southern Cross	2	2	388.06	508.86	120.79	31.1%	5.6%
Tambellup	4	5	388.06	508.86	120.79	31.1%	5.6%
Tammin	2	5	388.06	508.86	120.79	31.1%	5.6%
Three Springs	3	5	388.06	508.86	120.79	31.1%	5.6%
Tincurrin	5	5	388.06	508.86	120.79	31.1%	5.6%
Toodyay	2	5	388.06	508.86	120.79	31.1%	5.6%
Trayning	4	5	388.06	508.86	120.79	31.1%	5.6%
Varley	5	5	388.06	508.86	120.79	31.1%	5.6%
Wagin	3	5	388.06	508.86	120.79	31.1%	5.6%
Walkaway	1	1	388.06	468.56	80.50	20.7%	3.8%
Walpole	4	5	388.06	508.86	120.79	31.1%	5.6%
Wandering	4	5	388.06	508.86	120.79	31.1%	5.6%
Waroona/Hamel	1	5	388.06	508.86	120.79	31.1%	5.6%
Watheroo	4	5	388.06	508.86	120.79	31.1%	5.6%
Wellstead	5	5	388.06	508.86	120.79	31.1%	5.6%
Westonia	3	4	388.06	508.86	120.79	31.1%	5.6%
Wickepin	3	5	388.06	508.86	120.79	31.1%	5.6%
Widgiemooltha	4	5	388.06	508.86	120.79	31.1%	5.6%
Williams	2	5	388.06	508.86	120.79	31.1%	5.6%
Wiluna	2	5	443.93	605.86	161.92	36.5%	6.4%

Name of Town	Current Class	Proposed Class	Current Annual Water Bill 2009/10 (250 kL for South, 350 kL for North)	Annual Water Bill in 2013/14 (250 kL for South, 350 kL for North)	Variation in Annual Water Bill Between 2009/10 – 2013/14		Average Annual Variation in Water Bill
					($)	(%)	(%)
Wongan Hills	4	5	388.06	508.86	120.79	31.1%	5.6%
Woodanilling	3	5	388.06	508.86	120.79	31.1%	5.6%
Woodridge	2	5	388.06	508.86	120.79	31.1%	5.6%
Wubin	4	5	388.06	508.86	120.79	31.1%	5.6%
Wundowie	1	1	388.06	468.56	80.50	20.7%	3.8%
Wyalkatchem	3	5	388.06	508.86	120.79	31.1%	5.6%
Wyndham	4	5	443.93	605.86	161.92	36.5%	6.4%
Yalgoo	4	5	443.93	605.86	161.92	36.5%	6.4%
Yalgorup	3	5	388.06	508.86	120.79	31.1%	5.6%
Yarloop	1	5	388.06	508.86	120.79	31.1%	5.6%
Yealering	3	5	388.06	508.86	120.79	31.1%	5.6%
Yerecoin	5	5	388.06	508.86	120.79	31.1%	5.6%
York	2	4	388.06	508.86	120.79	31.1%	5.6%
Yuna	5	5	388.06	508.86	120.79	31.1%	5.6%

28.2 Impacts on Country Wastewater Customers

Name of Town	Current Average Annual Wastewater Bill 2009/10	Average Wastewater Bill in 2013/14	Variation in Annual Wastewater Bill Between 2009/10 – 2013/14		Average Annual Variation in Wastewater Bill
			($)	(%)	(%)
Albany	659	691	32	4.8%	0.9%
Augusta	650	686	36	5.5%	1.1%
Australind	664	699	35	5.3%	1.0%
Beverley	640	281	-359	-56.1%	-15.2%
Binningup	688	699	12	1.7%	0.3%
Boddington	660	606	-54	-8.1%	-1.7%
Boyanup	686	281	-405	-59.0%	-16.4%
Bremer Bay	601	639	38	6.2%	1.2%
Bridgetown	686	689	4	0.5%	0.1%
Broome	641	700	59	9.2%	1.8%
Brunswick	522	698	176	33.8%	6.0%
Bunbury	543	695	152	28.0%	5.1%
Burekup	658	699	41	6.3%	1.2%
Busselton	516	692	176	34.0%	6.0%
Capel	686	693	7	1.0%	0.2%
Carnarvon	672	655	-17	-2.6%	-0.5%
Cervantes	675	699	24	3.6%	0.7%
Collie	663	627	-37	-5.5%	-1.1%
Coral Bay	688	281	-407	-59.2%	-16.4%
Corrigin	520	453	-66	-12.8%	-2.7%
Cowaramup	688	700	12	1.8%	0.4%
Cranbrook	500	281	-219	-43.8%	-10.9%
Cunderdin	509	590	80	15.8%	3.0%
Dalyellup	595	460	-135	-22.7%	-5.0%
Dardanup	687	696	9	1.3%	0.3%
Denham	671	690	19	2.8%	0.6%
Denmark	672	693	21	3.2%	0.6%
Derby	660	699	39	5.9%	1.2%
Dongara/Deniso	663	685	22	3.3%	0.7%

Name of Town	Current Average Annual Wastewater Bill 2009/10	Average Wastewater Bill in 2013/14	Variation in Annual Wastewater Bill Between 2009/10 – 2013/14		Average Annual Variation in Wastewater Bill
			($)	(%)	(%)
Donnybrook	670	617	-54	-8.0%	-1.7%
Dunsborough	675	699	24	3.6%	0.7%
Eaton	674	697	24	3.5%	0.7%
Eneabba	666	618	-48	-7.2%	-1.5%
Esperance	559	638	79	14.1%	2.7%
Exmouth	561	632	71	12.6%	2.4%
Fitzroy Crossi	675	281	-394	-58.4%	-16.1%
Geraldton WWSc 2	573	696	123	21.5%	4.0%
Gnarabup	624	700	76	12.2%	2.3%
Gnowangerup	494	621	127	25.6%	4.7%
Greenhead	688	700	12	1.8%	0.4%
Greenough WWSc	688	471	-217	-31.5%	-7.3%
Halls Creek	641	698	57	8.8%	1.7%
Harvey	585	666	82	14.0%	2.6%
Hopetoun	688	700	12	1.8%	0.4%
Horrocks	539	471	-68	-12.7%	-2.7%
Jurien	674	699	24	3.6%	0.7%
Kalbarri	554	637	84	15.1%	2.9%
Kambalda	402	658	256	63.8%	10.4%
Karratha	432	573	141	32.5%	5.8%
Katanning	441	560	119	27.0%	4.9%
Kellerberrin	620	556	-64	-10.3%	-2.2%
Kojonup	583	510	-73	-12.5%	-2.6%
Kulin	484	419	-66	-13.6%	-2.9%
Kununurra	637	700	63	9.9%	1.9%
Lake Argyle	688	673	-14	-2.1%	-0.4%
Lancelin	678	700	22	3.2%	0.6%
Laverton	601	682	81	13.5%	2.6%
Ledge Point	587	598	11	2.0%	0.4%
Leeman	671	684	12	1.8%	0.4%
Leonora	534	659	125	23.4%	4.3%
Mandurah	606	665	59	9.7%	1.9%

Name of Town	Current Average Annual Wastewater Bill 2009/10	Average Wastewater Bill in 2013/14	Variation in Annual Wastewater Bill Between 2009/10 – 2013/14		Average Annual Variation in Wastewater Bill
			($)	(%)	(%)
Manjimup	667	661	-7	-1.0%	-0.2%
Margaret River	582	699	117	20.1%	3.7%
Meckering	529	534	5	0.9%	0.2%
Merredin	546	661	114	20.9%	3.9%
Mount Barker	657	601	-56	-8.6%	-1.8%
Mukinbudin	480	577	98	20.4%	3.8%
Nannup	628	559	-69	-11.0%	-2.3%
Narembeen	486	427	-59	-12.1%	-2.5%
Narrogin	430	605	175	40.7%	7.1%
Newdegate	526	548	22	4.2%	0.8%
Newman	279	492	213	76.1%	12.0%
Northam	563	663	100	17.8%	3.3%
Onslow	687	700	12	1.8%	0.4%
Pemberton	631	573	-58	-9.2%	-1.9%
Pingelly	503	435	-69	-13.6%	-2.9%
Pinjarra	541	652	111	20.4%	3.8%
Port Hedland	686	700	14	2.0%	0.4%
Quairading	555	627	73	13.1%	2.5%
Roebourne	629	587	-42	-6.7%	-1.4%
Sea Bird	688	699	11	1.7%	0.3%
South Hedland	677	698	21	3.0%	0.6%
Tambellup	399	281	-119	-29.7%	-6.8%
Three Springs	497	529	32	6.5%	1.3%
Toodyay	664	605	-59	-8.9%	-1.9%
Wagin	530	527	-3	-0.5%	-0.1%
Walpole	669	611	-59	-8.8%	-1.8%
Waroona	407	559	151	37.1%	6.5%
Wickham	611	660	49	7.9%	1.5%
Williams	592	520	-72	-12.2%	-2.6%
Wiluna	276	281	5	1.8%	0.4%
Wongan Hills	491	629	137	27.9%	5.0%
Wundowie	492	607	114	23.2%	4.3%

Name of Town	Current Average Annual Wastewater Bill 2009/10	Average Wastewater Bill in 2013/14	Variation in Annual Wastewater Bill Between 2009/10 – 2013/14		Average Annual Variation in Wastewater Bill
			($)	(%)	(%)
Wyalkatchem	400	520	120	30.1%	5.4%
Wyndham	633	573	-60	-9.5%	-2.0%
York	663	662	-1	-0.1%	0.0%